ACADEMIC CATALOG
2007-2009

University of North Dakota
Grand Forks, North Dakota

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SUGGESTIONS AND COMPLAINTS
The University welcomes suggestions and/or complaints from students, faculty, and staff, which should be directed to the unit or personnel most directly involved. It is only in this way that the institution can become aware of potential problems and take appropriate action. 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 University Directory, 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.nodak.edu/dept/registrar/gradrates. 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 Graduate School, Joseph N. Benoit, Dean. Printing by Forum Communications Printing of Fargo, North Dakota.

UND
is a series of periodicals published six times a year in March, April, July, August, September and October by the University of North Dakota, 411 Twamley Hall, 264 Centennial Drive, Stop 7144, Grand Forks, North Dakota 58202. Periodicals postage paid at Grand Forks, North Dakota. POSTMASTER: Send address changes to UND Enrollment Services Office, 250 Centennial Drive, Stop 8135, Grand Forks, ND 58202-8135.

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,

Charles E. Kupchella  
President
### FALL SEMESTER 2007-2008 (0810) 2008-2009 (0910)

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<td>Holiday, Labor Day</td>
<td>September 3</td>
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<td>Last day to add a full-term course</td>
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<td>Last day on which candidate may apply for a degree</td>
<td>September 18</td>
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<tr>
<td>Last day for students to submit incomplete work to instructor</td>
<td>September 28</td>
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<td>Last day for instructor to submit removals of incomplete work to the Office of the Registrar</td>
<td>October 5</td>
<td>October 7</td>
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<td>Last day to drop S/U course</td>
<td>November 2</td>
<td>November 7</td>
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<td>Last day to change to/from S/U grading</td>
<td>November 2</td>
<td>November 7</td>
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<td>Holiday, Veterans Day</td>
<td>November 12</td>
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<tr>
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<td>November 15</td>
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<tr>
<td>Thanksgiving recess</td>
<td>November 22-23</td>
<td>November 27-28</td>
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<td>Last day to submit final copy of thesis or dissertation to the Graduate School</td>
<td>November 29</td>
<td>December 4</td>
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<tr>
<td>Last day to file final report on degree examinations and independent study completion in the Graduate School</td>
<td>December 6</td>
<td>December 11</td>
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<tr>
<td>Reading and Review Day</td>
<td>December 7</td>
<td>December 12</td>
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<tr>
<td>Semester examination period</td>
<td>December 10-14</td>
<td>December 15-19</td>
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<tr>
<td>Winter Commencement and Official Graduation Day</td>
<td>December 14</td>
<td>December 19</td>
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<td>Grades due at noon</td>
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<td><strong>SPRING SEMESTER</strong> 2007-2008 (0830) 2008-2009 (0930)</td>
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<td>January 7</td>
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<td>Last day for advancement to candidacy for all graduate students planning to graduate in May</td>
<td>January 7</td>
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<tr>
<td>Holiday, Martin Luther King Jr. Day</td>
<td>January 21</td>
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<td>January 22</td>
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<tr>
<td>Last day on which candidates may apply for a degree</td>
<td>February 5</td>
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<td>Last day for students to submit incomplete work to instructor</td>
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<td>February 29</td>
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<tr>
<td>Holiday, Presidents' Day</td>
<td>February 18</td>
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<tr>
<td>Spring recess</td>
<td>March 3-7</td>
<td>March 16-20</td>
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<td>Last day to drop</td>
<td>March 28</td>
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<td>Last day to change to/from S/U</td>
<td>March 28</td>
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<tr>
<td>Holiday, Easter</td>
<td>March 21-24</td>
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<td>Last day to file preliminary approval of thesis or dissertation form in the Graduate School</td>
<td>April 10</td>
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<td>April 24</td>
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<td>Last day to file final report on degree examinations and independent study completion in the Graduate School</td>
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<td>May 5-9</td>
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<td>May 10</td>
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<td>Grades due at noon</td>
<td>May 13</td>
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<td>**SUMMER SESSION 2007-2008 (0840) 2008-2009 (0940)</td>
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<td>Beginning of instruction</td>
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<td>May 26</td>
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<tr>
<td>Last day on which candidates may apply for a degree</td>
<td>June 10</td>
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<td>Holiday, Independence Day</td>
<td>July 4</td>
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<td>July 10</td>
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**All academic-deadline dates apply to full-term, on-campus courses.**
## 2007-2009 Academic Biennium

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SA TISFACTORY 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.

POLICY ON EQUAL OPPORTUNITY

It is the policy of the University of North Dakota that there shall be no discrimination against persons because of race, religion, age, color, sex, disability, sexual orientation, national origin, marital status, veterans’ status, or political belief or affiliation, and that equal opportunity and access to facilities shall be available to all. This policy is particularly applicable in the admission of students in all colleges and in their academic pursuits. It also is applicable in University-owned or University-approved housing, food services, extracurricular activities and all other student services. It is the guiding policy in the employment of students either by the University or by non-University employers through the University and in the employment of faculty and staff. Inquiries as to the equal opportunity, affirmative action, or diversity policies for the University of North Dakota or coverage of state and federal civil or human rights statutes or regulations may be directed to the Affirmative Action Officer.

The Affirmative Action Officer, Sally J. Page (Office address: 101 Twamley Hall; mailing address: Box 7097, Grand Forks, ND 58202-7097; phone: 701-777-4171; email address: affirmativeaction@mail.und.nodak.edu) is assigned the responsibility to be the University’s designated coordinator for receiving complaints of discrimination or harassment under the following federal regulations: Title IX of the Education Amendments of 1972 (sex/gender discrimination); Title VI of the Civil Rights Act of 1964 (race, color, national origin, discrimination); Age Discrimination Act of 1975 (age discrimination); Section 504 of the Rehabilitation Act of 1973 and the Americans With Disabilities Act of 1991 (disability discrimination); and other equal opportunity statutes for which a coordinator is not required. Any complaint or concern regarding discrimination or harassment, not resolved by the University, may be filed with the Office of Civil Rights, U.S. Office of Education, 111 North Canal Street, Suite 1053, Chicago, IL 60606-7204.

DISCRIMINATION OR HARASSMENT

The University of North Dakota does not tolerate harassment. If you feel that you have been harassed, please report the incident to one of the following: If you are a student, contact the Dean of Students Office. If you are a graduate student and the harassment deals with academic issues, graduate assistantships, awards, and scholarships, contact the Graduate School. If you work within the academic arena, contact the Office of the Dean. If you are a medical student or resident, contact the Associate Dean of Students of the School of Medicine and Health Sciences. If you are a law student, contact the Office of the Dean of the School of Law. If the incident occurred in housing, contact the Housing Office. If you are a student or graduate student and the incident occurred during your employment as a student, contact the Financial Aid Office. If you are a staff member, contact Human Resources. Also, the Affirmative Action Office is always available to help. If University officials receive a report of harassment, the University will promptly investigate the matter and take disciplinary actions, when appropriate, in accordance with the University’s procedures—as detailed in the full harassment policy—for reporting incidents of possible harassment observed or which come to their attention. Retaliation in any form against any person who reports harassment, brings a complaint charging harassment, or participates in the harassment complaint process, is strictly prohibited. A provision identifying the range of penalties that may be considered when the University determines an individual engaged in harassment is included in the full harassment policy. The full harassment policy and grievance procedure may be found at: www.und.edu/dept/aaop/pol.htm, or in the University’s Code of Student Life at: und.edu/dept/csl.

UND STATEMENT ON INSTITUTIONAL DIVERSITY AND PLURALISM

Approved by University Senate December 7, 2006

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

DISABILITY ACCESS ON CAMPUS

The University of North Dakota is committed to providing access to all people using its facilities, programs and services. UND expects people to report access barriers so that appropriate action can be taken to correct the problems. Call the ADA Line (Facilities Department 24-hour call line) at 777-2591 (voice) or 777-2796 (TDD).

In addition, 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 classroom accommodations, contact Disability Support Services, 777-3425; for accessible campus bus service, contact Transportation at 777-4030; for accessible state fleet vehicles, contact Transportation at 777-4122; for accessible parking permits, contact the Traffic Division at
777-3551; and for accessible campus housing, contact the Housing Office at 777-4251. Job accommodation requests should be directed to the employee’s supervisor or the Affirmative Action Officer at 777-4171.

**CODE OF STUDENT LIFE**

The University of North Dakota *Code of Student Life* is a publication issued each year 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. Copies of the *Code* are available at: http://sos.und.edu/csl or the Office of the Vice President for Student and Outreach Services, 307 Twamley Hall and at the Dean of Students Office, 180 McCannel Hall.

**MEASLES/MUMPS/RUBELLA IMMUNIZATION**

Students enrolled in a course offered for credit at NDUS institutions in North Dakota must provide documentation of immunity against measles, mumps and rubella in accordance with North Dakota University System policy. Students enrolled only in distance learning or other courses taught off campus, students enrolled only in continuing education or non-credit courses, and students attending camps and workshops are exempt from this policy. Documentation of immunity means: (a) evidence of two doses of measles, mumps, and rubella (MMR) vaccine no less than one month apart from a licensed physician or authorized representative of a state or local health department, (b) proof of a positive serologic test for measles, mumps, and rubella, or (c) proof of date of birth prior to 1957. Students will be allowed one semester to provide this information to Student Health Services, McCannel Hall, telephone (701) 777-4500, and if it is not provided by then, further registration may not be allowed until proof of such immunization is provided.

Exceptions to this policy may be granted by Student Health Services only when: (a) immunization is contraindicated by illness, pregnancy, certain allergies, or other medical conditions certified by a licensed physician, (b) the student has had one immunization and agrees to have a second one no less than one month later, or (c) the student’s bona fide religious beliefs preclude participation in an immunization program.

**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: undpolice@mail.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. The official email account will be provided in the und.edu or und.nodak.edu domain. Students can expect to receive official information regarding deadlines, student account balances, policy/procedure changes, changes in degree requirements, special events, course schedule changes, regulatory changes, emergency notices, as well as other useful information from the Registrar, Office of Financial Aid, Business Office, the Provost's Office, Dean of Students, the Graduate School and information from academic departments. Students are responsible for all information sent to them via their university assigned email account. If a student chooses to forward their University email account, he or she is responsible for all information, including attachments, sent to any other email account.
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THE SCOPE OF THE UNIVERSITY

Classified as a high research activity, doctoral/professional and engaged university by the Carnegie Foundation for the Advancement of Teaching, the University of North Dakota is a coeducational, state-supported institution which recorded an enrollment of 12,834 students in the fall of 2006. UND is located in Grand Forks, a city of 50,000 situated across the Red River from East Grand Forks, Minnesota, about 300 miles northwest of Minneapolis and 150 miles south of Winnipeg.

This university is characterized by a solid foundation of 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 193 fields through 10 major units: College of Arts and Sciences (which includes a major division devoted to music, theater and visual art), Odegard School of Aerospace Sciences, College of Business and Public Administration, School of Engineering and Mines, College of Nursing, College of Education and Human Development, School of Law, School of Medicine and Health Sciences, Division of Continuing Education, and Graduate School (offering the doctorate in 23 programs, the specialist’s degree in one program, the master’s degree in 57 programs).

In the fall of 2006, about 51 percent of UND’s students were residents of North Dakota and about 30 percent were from Minnesota, with the remainder representing every other state, Canada and about 50 other countries. Some 81 percent were enrolled in UND’s undergraduate programs. The University awarded 2,649 degrees in 2005-2006, including 1,874 undergraduate degrees, 500 master’s degrees, 110 doctoral degrees, 60 law degrees, 57 M.D. degrees and 2 specialist degrees.

A total of $94.3 million in research and sponsored program activities was received in fiscal year 2005-2006.

The University’s faculty and research staff numbers 790 full-time individuals. Its total full-time workforce of 2,696 makes it the state’s largest employer outside the two U.S. Air Force bases.

UND’s 549-acre campus, regarded as one of the most beautiful in the region, includes 223 buildings and 5.33 million square feet of space. Facilities include a Barnes and Noble University/community bookstore 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, Burt Ness Theatre, Josephine Campbell Recital Hall, and Hyslop Sports Center, in bringing cultural, entertainment, and athletic programming to the community.

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. Depressions, drought, wars and financial crises have more than once threatened its future, but the University has been able to withstand these challenges and 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 has served 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 NCA accreditation in 2004. Many individual colleges, schools, and departments are members of accrediting associations in their respective fields. The address and telephone number of the North Central Association are: Higher Learning
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, credit and non-credit workshops, institutes and special programs of various lengths. See the academic calendar at the front of the catalog.

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 index at the back of the catalog.

Visitor Information

Visitors always are welcome at the University of North Dakota.

Office Hours: 8 a.m. to 4:30 p.m., Monday through Friday, although some buildings such as the Chester Fritz Library and the UND Memorial Union are open for extended hours, including weekends.

Visitor Information: Stop at the Info-Center desk in the UND Memorial Union, the main desk in Wilkerson Hall, the J. Lloyd Stone Alumni Center, or the Chester Fritz Auditorium.

Telephone Numbers: The area code for Grand Forks is 701. Call 777-2011 for administrative or academic office numbers; call 777-3565 for residence hall or family housing numbers. If you are calling long distance, call 1-800-CALL-UND.

Event Information: Call the Info-Center at 777-4321, watch UND Television Cable Channel 3, stop at the visitor information locations listed above, consult UND’s on-line calendar on the worldwide web: www.und.edu/calendar, or write or call the Office of University Relations, 777-2731.

Tickets: Athletic tickets are available at the Memorial Union Athletic Ticket Window, hours 10 a.m. to 11 p.m., Monday-Thursday and 10 a.m. to 10 p.m., Friday (telephone 777-4689) or 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 for all athletic events can also be purchased by using Ticketmaster, telephone 772-5151, or at any Ticketmaster outlet; Burtness Theatre (site of Theatre Arts Department and touring productions) Box Office open approximately two weeks prior each to production, 2 to 5 p.m., Monday through Friday (telephone 777-2587 for tickets; 777-3446 for information). Chester Fritz Auditorium Box Office open from 8:30 a.m. to 4:00 p.m., Monday through Friday (telephone 777-4090 for information, 772-5151 to purchase tickets or visit any Ticket Master outlet). Alerus Center Box Office is open 10 a.m.-4 p.m., Monday-Friday, 792-1420.

Prospective Student Tours: Arrange by contacting the Office of Enrollment Services at: enrollmentservices@mail.und.nodak.edu, telephone 777-4463 or 1-800-CALL UND, ext. 4463 (also see section titled Campus Visits for Prospective Students).

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 bonus meals for guests). 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. Convenience store service is also available in Wilkerson Hall, 4 p.m. to 11 p.m., Monday-Sunday; the Walsh Convenienc store, main level of Walsh Hall, 4 p.m. to 11 p.m., Monday-Sunday, and the U-Snack at the Memorial Union, 7:30 a.m. to 8 p.m. The food court at the Memorial Union, Old Main Marketplace, features A&W Express, Sharro Pizzeria, Dakota Deli, and World Market, as well as grab n’ go options. Hours are Monday-Saturday, 10 a.m. to 9 p.m., Sunday, noon to 9 p.m. Stomping Grounds coffee shop in the Memorial Union serves Seattle’s Best coffee, espresso, specialty coffee drinks and features fresh baked items from the UND Bakery, hours are 7 a.m. to 10 p.m., Monday-Friday; 8 a.m. to 10 p.m. Saturday, and noon to 10 p.m. Sunday.

Other eating facilities include: Subway in Johnstone Hall, 11 a.m. to midnight, seven days a week; Wings (Airport) Café, UND Administrative Aerospace Center, Airport, 7 a.m. to 1:30 p.m., Monday through Friday, providing subs, sandwiches, hot meal entrees, and various other offerings. Find fresh fruit smoothies and lunch items at “The Well,” a juice and snack bar located in the atrium of the Wellness Center, open at 11:00 a.m., Monday through Friday. The food cart in the Medical School lower level offers breakfast and lunch choices, including sandwiches and beverages, 7:30 a.m. to 1:30 p.m., Monday through Friday (hours may vary). For more information visit the Dining Services website at: www.housing.und.edu/dining. The North Dakota Museum of Art Cafe, on the lower level of the Museum building, serves cappuccino, espresso, and pastries, 9:30 a.m. to 4:30 p.m., Monday through Friday, and lunch is served 11:30 a.m. to 2 p.m. Tabula Coffee House, 3012 University Avenue, is open 7 a.m. to 11 p.m. Monday through Friday, 8 a.m. to 11 p.m. Saturdays, and noon to 11 p.m. Sundays.

Parking: Visitors are always welcome on campus. You are encouraged to stop by the Parking office in the lower level of the Memorial Union to obtain a free visitor’s permit. The only parking restrictions that apply to visitors are metered and time zones, reserved parking in University Residence Halls or Apartments, Service Vehicle areas, towable offenses, and handicap violations. Any other infractions will be waived for visitors. Simply complete the visitor section on the ticket and return it to the Parking Office within 14 calendar days. For further information, call 701-777-3551.

Books and Memorabilia: The University Bookstore, operated by Barnes and Noble, 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.

J. Lloyd Stone Alumni Center: This restored turn-of-the-century mansion is open for tours; today it serves as headquarters for the UND Alumni Association and Foundation, telephone (701) 777-2611, 1-800-543-8764 out-of-state.

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 Sioux athletes are included. It is located in the Ralph Engelstad Arena on the south end of the upper concourse.

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

The school you attend can be one of the most important investments in your life, so you will want to learn as much as possible about the colleges and universities you are considering. Brochures and catalogs can tell you much, but a visit to the campus can go beyond that in providing the mood and the atmosphere of an institution and its people. A campus visit gives you the opportunity to experience the total environment, including the host community. After all, you will not be spending all your time in the classroom.

During a visit you can meet with campus personnel in a variety of situations. You can talk to an Enrollment Services representative, faculty members, and to students. You can also eat in campus dining facilities and participate in a residence hall showroom tour. When you set up an appointment for a visit to UND, we can assist you with arrangements for your overnight stay.

Tell us when you want to come and we will work out the details. We will send you a special brochure about visiting the University to help answer questions about what to do when you come to campus. If special accommodations are needed, let us know in advance. It is best if you give us a week’s notice for a visit, but feel free to stop in or call at any time. The easiest way to set up a visit is to call 1-800-CALL UND and ask for the Office of Enrollment Services, call (701) 777-4463, send an email to: enrollmentservices@mail.und.nodak.edu, or write to: Office of Enrollment Services, University of North Dakota, Carnegie Hall Room 100, 250 Centennial Drive, Stop 8135, Grand Forks, ND 58202-8135. You can also find us on the web at: http://www.go.und.edu.

PARKING REGULATIONS

All parking on campus is permit parking only. Students who drive a vehicle on campus must purchase a parking permit upon arrival. Permits can be purchased at the Parking Office (lower level of Memorial Union). It is the responsibility of the individual to prominently display the permit and comply with University Motor Vehicle Regulations at all times.

If you are a VISITOR ON CAMPUS, please see the Visitors Information Section about visitor parking permits.

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/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 that any or all 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. To insure restriction of directory information from the printed University Directory, the process should be completed by the tenth day of classes in the fall semester.

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 University 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 activities conducted by the faculty, UND undergraduate and graduate students have expanded opportunities to broaden and enrich their educational experience. In addition to contributing to the educational mission of the University, the results of the research are often of direct benefit to the residents of the state and to the nation as a whole.

Research activities are conducted through University research programs and individual faculty members working within their own departments. Several of the UND research programs are involved in public service activities which provide an opportunity for faculty and students to conduct research projects directly benefiting the public.

Financial support for research activities is provided either from University sources, such as the University Senate Scholarly Activities Committee, the Faculty Research Seed Money Program and Research Development and Compliance (RD&C), or through funds provided from external agencies such as Federal or State government, private foundations, and industry. In fiscal year 2006, $94.3 million of external support was received for sponsored program activities. Sponsored program expenditures were $80.4 million.
Major UND research programs include:

**Anthropology Research:** Anthropology Research is affiliated with the Department of Anthropology at the University of North Dakota. The program provides a variety of archeological and cultural resources management services to federal, state, and private organizations. Its primary research involves archeological investigation of the prehistoric cultures and peoples who occupied the Northern Great Plains, chiefly in the Dakotas. The program has a number of full-time faculty and staff who provide in-house specialties and who consult with other organizations that provide additional research capabilities. Student training and involvement in lab and field research projects are also provided.

**Center of Excellence in Neurosciences:** The goal of the Center of Excellence in Neurosciences is to help talented investigators develop expertise in multidisciplinary approaches toward the understanding of brain function in health and disease, including Parkinson’s disease and Multiple Sclerosis which have high incidences in the State of North Dakota.

**Center for Rural Health:** The Center for Rural Health works to connect resources and knowledge to strengthen the health of people in rural communities. For 25 years, the Center for Rural Health has worked with the public and private sectors, expanding a circle of partners to develop creative solutions to critical health issues.

Located at the University of North Dakota School of Medicine and Health Sciences in Grand Forks, the Center for Rural Health uses a multidisciplinary approach to create solutions to complex challenges. To do this, the Center for Rural Health works closely with communities, health care organizations, health care providers, policymakers, researchers, tribal nations and other rural health stakeholders.

The Center for Rural Health serves the people of the state, region and nation by using research and knowledge to inform policymakers and assist communities. As a resource, its staff advocates for rural concerns, analyzes health policy, assists with community and economic development relating to health systems, develops community-based alternatives, enhances networks, identifies and researches economic development relating to health systems, develops communities, analyzes health policy, assists with community and rural concerns, focuses on policy development and health care initiatives. It provides a variety of services to rural communities, including health care delivery, training, and research.

**The Energy and Environmental Research Center (EERC):** Located at the University of North Dakota School of Medicine and Health Sciences in Grand Forks, the Center for Rural Health uses a multidisciplinary approach to create solutions to complex challenges. To do this, the Center for Rural Health works closely with communities, health care organizations, health care providers, policymakers, researchers, tribal nations and other rural health stakeholders.

The Center for Rural Health serves the people of the state, region and nation by using research and knowledge to inform policymakers and assist communities. As a resource, its staff advocates for rural concerns, analyzes health policy, assists with community and economic development relating to health systems, develops community-based alternatives, enhances networks, identifies and researches rural health issues, targets underserved communities and populations, and strengthens local health care capabilities.

Because of the extensive and quality-driven work of the Center for Rural Health, it has been named a University of North Dakota Center of Excellence in Research. Scholarship and Creative Activity.

**More information is available at:** http://medicine.nodak.edu/crh.

**Energy and Environmental Research Center:** The 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 is a high-tech, nonprofit branch of the University of North Dakota, which operates like a business. The EERC currently employs more than 270 people and is aggressively expanding its staff. The Center was founded in 1951 as the Robertson Lignite Research Laboratory, a federal facility under the U.S. Bureau of Mines. It became a federal energy technology center under the U.S. Department of Energy (DOE) in 1977 and was defederalized in 1983. Today, the EERC leverages and enhances government research dollars by developing working partnerships with industry, government, and the research community. Since 1983, the EERC has had more than 800 clients in all 50 states and 47 countries. In FY2004, 90 percent of its contracts were funded by non-federal entities.

The EERC conducts research, development, demonstration, and commercialization activities involving all fossil, renewable, and alternative fuels; advanced power and energy systems; environmental chemistry; environmental control technologies; hydrogen production, distribution, and fuel cell technology; waste utilization, management, and siting; and water management. In addition, to its nine centers of excellence which include the Center for Air Toxic Metals® (CATM®), the Center for Biomass Utilization® (CBU®), the Coal Ash Research Center, the Coal Utilization Technologies Center, the Emission Control Technologies Center, the National Alternative Fuels Laboratory® (NAFL®), the Supercritical and Subcritical Extraction Technologies Center, the Water Management Center, and the Wind Energy Resources Center, the EERC has been designated as the National Center for Hydrogen Technology.

**North Dakota Biomedical Research Infrastructure Network (INBRE):** North Dakota INBRE’s purpose is to build biomedical research capacity within the state. Networking and human resource development are the watchwords for this collaborative effort between the two North Dakota research universities, four baccalaureate institutions in the North Dakota University System and five tribal community colleges. The Center is a research oriented program involving basic science and clinical departments. All faculty are involved in research and the graduate students are in training to become independent investigators. A major feature of the Center is the extensive collaborative interactions among its faculty. Faculty and students have numerous collaborative interactions that enable them and their colleagues to pursue common research goals, often at the interface between traditional areas of research.

**Regional Weather Information Center:** The Regional Weather Information Center (RWIC) is a weather education and research center focusing on issues of climate, transportation, agriculture, fine-scale weather phenomena, and geospatial technology. As a research, outreach, and information center, RWIC provides support to students, faculty and staff in the Atmospheric Science program, the University of North Dakota (UND), the State of North Dakota, and the Upper Midwest. RWIC provides students pursuing degrees in atmospheric sciences opportunities to participate in both operational and research aspects of contemporary meteorology. The programs and data resources of RWIC allow students to broaden their knowledge base within their areas of interest as they complete their undergraduate and graduate education. A major component of RWIC is experiential learning in a wide range of research and operational meteorology endeavors. This permits students to improve their skills while continuing their on-campus courses. Students with an interest in remote sensing have access to geostationary and polar orbiting satellite information and to national radar data. Students with an interest in analyzing current and predicting future atmospheric conditions can utilize the latest atmospheric analysis systems and models. These include a locally executed analysis system and mesoscale model to compare and analyze data in creating forecasts. As part of its endeavors, RWIC uses data from numerous observational platforms. Thus, students with an interest in data collection and analyzing observations have opportunities to enhance their skills at RWIC.

**Upper Midwest Aerospace Consortium:** UMAC provides products and services for agriculture, for natural resource management, for cultural resource preservation, and for K-12 education, using satellite imagery and other spatial technologies. UMAC also provides information and educational outreach services to the general public with respect to regional impacts of environmental and climatic change by operating as the Northern Great Plains Center for People and the Environment, committed to leading a transition to sustainability. As a consortium, UMAC is led by the University of North Dakota, and includes participants from academia, industry, and government located throughout North Dakota, South Dakota, Montana, Wyoming, and Idaho.
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 is one of these learning communities. A nationally-known, award-winning program, Integrated Studies (ISP) provides an alternative method for taking the general education classes which UND requires. Each semester of ISP includes credit from each of the four general education categories: Communications; Social Sciences; Arts and Humanities; and Math, Science, and Technology. All class activities and discussions are organized around a central theme to develop connections between disciplines, and 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: www.und.edu/dept/integr8.

The Wellness Community focuses on living a balanced lifestyle within the college environment. As members of the Wellness “wing” in Brannon Hall, you will 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 Honors Program (described below) is a learning community designed for students with an interest in intellectual and creative pursuits. Students participate in an Honors class or two per semester as part of their program of study throughout their undergraduate education. Other educational, social, and service activities extend their learning beyond the classroom experience. Honors housing allows students the option of carrying the learning community into specially designated wing of Fulton residence hall. For information on Honors housing, contact the Housing Office at (701) 777-4251. Students in any college of the University may apply for admission to this learning community. For more information, call (701) 777-2219.

THE HONORS PROGRAM
http://www.und.edu/dept/honors/

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. High school graduates are encouraged to apply at the time of their initial registration at the University. Students may also enter the Program after the first year, and inquiries from interested students are welcome. Please phone (701) 777-2219 or email: honors@sage.und.nodak.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 the Colleges, but 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 faculty with students. 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: (a) a minimum of 24 credits in Honors work including 8 credits of colloquia; (b) a Sophomore Honors Portfolio; and (c) 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. Students who complete all Honors requirements may substitute Honors requirements for the General Education Requirements. To graduate without a major in the Colleges, 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. The present criterion is that a student should attain a 3.2 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 employees and graduate schools that the graduate is a serious, well-prepared, accomplished student.

THE SENIOR HONORS SYSTEM
http://www.und.edu/dept/honors/

In the Senior Honors System (formerly known as Departmental Honors), 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 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 courses, tutorial readings, projects of research, seminars, creative work, a thesis, 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.” 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 “with honors in (the major field)” will appear on the Commencement program and transcript.
TUITION AND FEES, 2006-2007*
(Per semester, 12 or more credits)**

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>$2,896.00</td>
<td>$4,093.00</td>
</tr>
<tr>
<td>Graduate</td>
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<tr>
<td>Law</td>
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<tr>
<td>Medicine</td>
<td>10,714.00</td>
<td>19,403.00***</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td>4,860.00</td>
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</table>

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 2005-07 totaled $503 per semester at UND (and is included in the above table). These include the student fees which support, among other functions, musical organizations, the UND Memorial Union, intercollegiate athletics, the health fee, student activity fees allocated by student government for such purposes as concerts and student publications, $247.14; Student Union bond retirement, $14.50; McCannel Hall renovation, $15.00; wellness operations, $45.00; wellness bond, $50.00; the ConnectND Fee, $81.00; the technology fee, $50.00; and the North Dakota Student Association fee, $0.36. The wellness, student activity, and bond retirement fees were approved by votes by the student body.

*All fees are subject to change without notice; contact the Office of Enrollment Services for up-to-date cost estimates. Contiguous states and provinces include South Dakota, Montana, Manitoba and Saskatchewan. Part-time students taking 11 or fewer hours are billed on a per-credit hour basis. Summer session tuition and fees are 75 percent of the semester rate.

**In addition to this tuition fee schedule, program fees are assessed in the College of Business and Public Administration, Engineering, Law, Nursing, Teacher Education and for graduate students as indicated in a following section titled “Other Fees.”

***Minnesota rate applies to those students enrolled beginning Fall, 2006.

OTHER FEES

Application Fee (Undergraduate) ....................... $35.00*
Payable by all undergraduate students applying for admission.

Application Fee for Graduate Students ................. $35.00*

Application Fee for Readmission for
Graduate Students ........................................ $35.00*

Application Fee for Medical Students ............... $50.00*

Application Fee for Housing .............................. $35.00* (residence halls and apartments)

Auditing Fee
Auditing fees will be 50% of the regular, per hour tuition charge for the same course.

Aviation Laptop Computer Program Fee
A program fee of $400 per semester (fall and spring) will be charged to all aviation students.

College of Business and Public Administration
A program fee will be charged to all students in the College of Business and Public Administration sophomore through graduate level, pre-business and other majors, instructed by CoBPA faculty. The program fee will be $100 per semester for full-time students and will be prorated for part-time students.

Engineering Program Fee
A program fee of $12.50 per credit hour (to a maximum of 12 credit hours) will be charged each semester to undergraduate students in engineering who have completed 60 semester credit hours on their UND transcript. A program fee of $25.00 a semester will be assessed to undergraduate students in engineering with less than 60 accumulated credits. A program fee of $150.00 a semester will be charged to graduate students in engineering.

Graduate Student Continuing
Enrollment Fee ........................................ $100.00 per credit**
Payable by each student registering for 996 (Continuing Enrollment).

Graduate Student Thesis Fee ............................... $20.00*
Charged for binding and microfilming the original copy of a thesis.

Graduate Student Dissertation Fee ........................ $75.00*
Charged for binding and microfilming a dissertation and publishing the abstracts in Dissertation Abstracts.

Graduate Student Copyright Fee ............................ $65.00*
Charged for securing copyright to a dissertation.

Late Payment Penalty ....................................... $200.00
A late payment penalty will be assessed all students who do not pay their tuition/fees or receive a deferment from the Business Office by the payment deadline. Deadline dates are listed in the semester time schedule of classes.

Law Program Fee
A program fee of $800 per semester ($1600 per academic year) will be charged to all law students.

Nursing Program Fees
For all students newly admitted to Nursing, a program fee of $300 per semester will be charged all undergraduate students enrolled in the professional nursing education programs that lead to a Bachelor of Science Degree and eligibility for licensure as a Registered Nurse.

A program fee of $500 per semester (prorated for part-time students) will be charged to all graduate students. Anesthesia graduate students have a program fee of $1,000 per semester. Family Nurse Practitioner has three semesters and will be charged $1,500 per academic year.

Outreach Programs Courses (See Schedule in Division of Continuing Education section of Catalog.)

Parking Fee .................................................. $50.00
Payable at the beginning of the fall semester for the entire year by students who own or operate a motor vehicle on campus. New second semester students pay $25 and new summer session students pay $12.50. Fees are subject to change.

Recreation and Leisure Services/Rehab and Human Services
A program fee of $225 per semester, pro-rated for part-time students, will be charged to all students admitted to these programs.

Social Work
A program fee of $225 per semester, pro-rated for part-time students will be charged to all undergraduate students admitted to the program. A program fee of $300 per semester, pro-rated for part-time students will be charged to all graduate students.

Special Examination for Credit
Fee per Semester Hour ................................. 1/2 the regular credit hour fee

Teacher Education Program
A program fee of $100 per semester will be charged to all students admitted to the Teacher Education Program.

* Non-refundable; subject to change

** Non-refundable; approved rate effective Fall, 2007
ESTIMATED YEARLY EXPENSES

The following table gives an estimate of the expenses of a single, undergraduate student residing on campus during the nine month, 2006-2007 college year. Detailed information about the cost of attending the University is available from the Office of Enrollment Services.

<table>
<thead>
<tr>
<th></th>
<th>North Dakota</th>
<th>Minnesota</th>
<th>Contiguous &amp; WUE States</th>
<th>Non-Resident</th>
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<tbody>
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<td>Tuition and Fees*</td>
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<tr>
<td>Total Est. Costs</td>
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<td>$14,830</td>
<td>$16,868</td>
<td>$22,468</td>
</tr>
</tbody>
</table>

*Plus matriculation fees ($35 one time)
**Costs based on UND residence hall rates (double room and 14 meal contract) and includes the Association of Residence Halls fee.

REGULATIONS REGARDING NON-RESIDENT FEES

TUITION FOR NON-RESIDENT STUDENTS (Requirements subject to change without notice): Non-resident students seeking to declare North Dakota residence for tuition purposes must submit an affidavit of residency for the term in which they are currently enrolled to the Business Office by the deadline published in the semester schedule of classes. For purposes of determining residency, a resident student is defined by law as follows:

1. A person whose guardian, custodial parent, or parents are legal residents of this state and have resided in this state for 12 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. (Applicant must be claimed as a dependent on the parent or guardian’s most recent federal tax return.);
2. A person of age eighteen or over who has been a legal resident of North Dakota for 12 months immediately prior to the beginning of the academic term;
3. A person who graduated from a North Dakota high school;
4. A full-time active duty member of the armed forces (does not include reserve members);
5. A spouse or dependent of a full-time active duty member of the armed forces (does not include reserve members) or of an employee of any institution of higher education in this state;
6. The spouse of any person who is a resident for tuition purposes; or
7. Any other person who was a legal resident of North Dakota for at least 3 consecutive years within 6 years immediately prior to the beginning of the academic term.

Applications for residency are available at the Business Office.

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 or immigrant status and must meet all the other North Dakota residency requirements for tuition purposes. Refugee students should contact the Business Office for requirements.

MINNESOTA TUITION RECIPROCITY

Residents of Minnesota and their dependents may attend a North Dakota state institution of higher learning and pay a special tuition rate that is lower than the normal non-resident rate. An exception to this is Medical and Law students enrolled beginning fall semester 2006. The Minnesota reciprocity tuition rate does not apply. This rate is determined by averaging the tuition costs of the North Dakota and Minnesota state university systems. To be certified for reciprocity at UND, Minnesota students must (1) file UND’s standard admission application, and (2) file a reciprocity participation application. Reciprocity applications are available online at: www.und.edu/dept/busoff/. Students who previously participated in the reciprocity program and have not earned credit in the previous 12 months must reapply.

CONTIGUOUS STATES/PROVINCES TUITION, FEES

Although residents of South Dakota, Montana, Manitoba and Saskatchewan are not covered by reciprocity agreements, they pay lower tuition and fees than do other non-residents.

WESTERN UNDERGRADUATE EXCHANGE PROGRAM

The University of North Dakota participates in the Western Undergraduate Exchange (WUE) program. Currently, students may enroll in designated programs at selected institutions in Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming at a special tuition level. For example, those attending the University of North Dakota under the WUE program pay an amount equal to one and one-half times the North Dakota in-state tuition and fees, which in 2006-07 would have totaled $8,186 instead of the normal $13,786 in non-resident tuition and fees for that year.

MIDWESTERN HIGHER EDUCATION CONSORTIUM

The University of North Dakota participates in the Midwest Higher Education Consortium (MHEC). Currently, students enrolled in designated programs at selected institutions in Michigan, Missouri, Nebraska, Wisconsin and Kansas attend at a special tuition level. For example, those attending the University of North Dakota under MHEC pay an amount equal to one and one-half times the North Dakota in-state tuition and fees, which in 2006-07 would have totaled $8,186 instead of the normal $13,786 for that year.

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.

REFUND OF INSTITUTIONAL CHARGES FOR WITHDRAWN STUDENTS

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 §30.2.

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.

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 written request to the Business Office in accordance with appeal process outlined in State Board policy §30.2 (#5).

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.

REFUND FOR CLASS CHANGES (DROP/ADD)

Any student who drops a class before 9% of the period of enrollment for the class is completed shall receive a 100% refund of tuition and fees for the credit hours attributable to the class or classes dropped. After 9% of the period of enrollment for a class is completed, no refund shall be made for a class which is dropped. However, classes of the same number of credits 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 and collaborative courses are not eligible for exchange.

STUDENT FINANCIAL AID

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

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

Most student aid is awarded on the basis of need. “Need” is the difference between cost of education (tuition, fees, room, board, books, supplies and related educational expenses) and the Expected Family Contribution, which is the amount the student and family is expected to contribute, as determined by a standard formula. In determining family contribution, four major sources are considered: (1) family income, (2) family assets, (3) student’s income, and (4) student’s assets.

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

The Financial Aid Office 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 upon the basis of academic performance and potential. Grants are gifts of money which do not have to be repaid. Most financial aid recipients may expect to receive more than one of these types of aid.

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 need 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, Stafford Loan, PLUS, Grad PLUS, Nursing Student Loan, Primary Care Loan, The Minnesota Student Educational Loan Fund (SELF), Canadian Higher Education Loan Program (CanHELP) and commercial educational loans are also available at UND. Many of the commercial education loan programs are available to students who are not degree-seeking or are enrolled less than half-time. A more complete listing of alternative education loans is available at: www.financialaid.und.edu.

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: www.financialaid.und.edu.

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 1,850 undergraduate scholarships totaling over $1.25 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) 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. No additional application is required. Current students should complete the Returning Student Scholarship Application form which is available at: www.financialaid.und.edu.

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: www.financialaid.und.edu. 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 2007-2008 school year, grants range from $400 to $4,310. 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.

The Academic Competitiveness Grant is a federal grant program for students in their first and second year of college. Students must have completed a rigorous high school program of study and must be a U.S. citizen and eligible for a Pell Grant. To be eligible for a second year award, students must have completed 30 credit hours with a minimum 3.0 GPA. More information on the eligibility requirements for this grant program is available at: www.financialaid.und.edu.

The National SMART Grant is a federal grant program for students in their third and fourth year of college. Students must be a US Citizen and eligible for a Pell Grant. Students must also be enrolled in an eligible program of study. More information on this program, including a list of UND programs eligible for this grant, is available at www.financialaid.und.edu.

Supplemental Educational Opportunity Grants (SEOG) are available to undergraduate students who qualify for the Pell Grant and meet the priority date of March 15. Eligible students enrolled at least half-time may receive grants up to $800 per year.

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 March 15. For 2007-2008, students awarded a Student Financial Assistance Grant will receive $600 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.

Financial Aid Procedures and Award Policies. March 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 March 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 March 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., Math 102 Intermediate Algebra, 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 correct. If students are selected, they may be asked to verify such information as income, federal income tax paid, household size, number in college, status as a dependent or independent student, and citizenship. As part of this process, students must provide the Student Financial Aid Office with their and/or their parents’ Federal Income Tax Return and in some cases, statements from Social Security Administration, Veterans Administration or other agencies to verify benefits the student and/or the student’s family has received. If information on any of these documents conflicts with the information reported on the student’s application, they may be required to provide additional information. 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:

1) Academic standards: students classified as juniors or seniors, and students who have attended UND for two or more academic years (4 semesters or more) 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 Academic Catalog meet this standard. All students must be eligible to re-enroll in the next term in order to meet this standard.

2) Rate of progress standards:
   a) students must complete their program of study within the maximum number of attempted credit hours;
   b) students must successfully complete 2/3 (66.6%) of the cumulative credit hours attempted each year. A more detailed Summary of the Standards of Satisfactory Progress for Financial Aid Eligibility is available at: www.financialaid.und.edu.

**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 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 may restrict the release of directory information no later than the tenth class day of the semester, in person, at the Registrar’s Office, Room 203, Twamley Hall, or online through the UND campus connection available at: www.und.edu.
Student Services, Support Programs and Activities

ACADEMIC SERVICES
(see Student Academic Services)

ADMISSIONS OFFICE
205 Twamley Hall
Phone (701) 777-3821

The Office of Admissions reviews and processes all applications for undergraduate admission, determines a student’s eligibility for admission according to university policy, and notifies the student regarding current admission status. The office responds to all inquiries relating to admission policies and procedures, coordinates the admission service with other administrative offices, and compiles data for reports. Permanent university records for all undergraduate students are created in this office.

AFFIRMATIVE ACTION-
EQUAL OPPORTUNITY COMPLIANCE
101 Twamley Hall
Phone (701) 777-4171 (Voice/TDD)

The Affirmative Action Office is responsible for oversight of the University’s equal opportunity and affirmative action programs, including Sections 503 and 504 of the Rehabilitation Act of 1973; Titles VI and VII of the Civil Rights Act of 1964; Age Discrimination in Employment Act; Title IX of the Education Amendments of 1972; Americans with Disabilities Act; and related Federal and State laws and regulations involving civil rights, equal employment and equal educational opportunity. The University declares that it will not discriminate on the basis of race, religion, age, color, sex, disability, sexual orientation, national origin, marital status, veterans’ status, or political belief or affiliation. It encourages the inclusion of members of minority groups (African-American/Black, Hispanic/Latino, Asian, Native American/American Indian), women and men in non-traditional roles, persons with disabilities, and Viet Nam era and disabled veterans in the mainstream of University employment, education, and services where these individuals, as a class, may have had limited opportunities in the past. Inquiries, reports, or complaints of discrimination, harassment, or the Family Educational Rights and Privacy Act may be addressed to the Affirmative Action Officer or other designated administrator. Policies and procedures are at www.und.nodak.edu/dept/aaao/Pol.htm.

UND ALUMNI ASSOCIATION AND UND FOUNDATION
J. Lloyd Stone Alumni Center
Strinden Center
Phone (701) 777-2611 or (800) 543-8764

UND alumni are a proud group of graduates and friends totaling over 109,000 strong. Involvement with the University through talent and resources has provided a tremendous margin of excellence and helped position UND as one of the top schools in the nation. The Alumni Association and Foundation are two private, non-profit organizations which exist under a mission to retain and strengthen friendships made on campus by keeping graduates and former students in lifelong contact with each other; to keep alumni informed of happenings at the University of North Dakota; and to involve graduates, former students and special friends in the ongoing growth and development of UND. This mission is accomplished through alumni relations and development initiatives involving reunions and fundraising programs to suit the interests of our varied alumni and serve the needs of the University.

While separate organizations, the Alumni Association and Foundation are overseen by one board of directors and led by one executive vice president. This unique structure has, since 1978, facilitated over $180 million to the University for the benefit of students, faculty and staff.

Alumni relations programs and activities are hosted around the United States as UND alumni live in all 50 states and in many countries around the world. Reunions, satellite parties, golf events, and other social activities are planned throughout the year as a way for alumni and friends to retain connections with each other and their alma mater. On-campus events, lectureships, mentoring programs and Homecoming are other opportunities for involvement. In 1981 Telesis, our student alumni association, was established to involve students in alumni activities and to give current students contact with outstanding alumni achievers.

Fundraising efforts revolve around current and ongoing needs at UND. The Annual Drive Fund supports regularly occurring expenses on campus. Campaigns are held at various times to reach the technology, facility, scholarship, and faculty goals of colleges or departments. Scholarships are initiated, supported and maintained through the Foundation. In fact, there are over 700 named endowments which finance student and faculty scholarships. The Foundation Call Center relies on student fundraisers to initiate contact with alumni for updates on campus, personal record information and as an opportunity for alumni to make or fulfill a pledge of financial support. Donations can be made in any amount, and designated toward any and all entities of campus.

Communication is an important aspect of all these efforts. The Alumni Review magazine, produced by the Alumni Association, is mailed, free of charge, to all alumni and friends throughout the year. The organizations’ Web site, www.undalumni.org, exists as a continuous way for alumni, friends and the community-at-large to maintain active connections with the University.

Alumni and friends of UND are integral to the success of this institution. Intellectual, financial and fan support are just a few of the ways people give back. Every college, school, department, faculty member, and student has benefited from the generosity of alumni and friends through one form or another. This rich tradition of pride and community was established by UND’s first eight graduates and continues fervently today.

AMERICAN INDIAN STUDENT SERVICES
315 Princeton Street
Phone (701) 777-4291

American Indian Student Services (AISS) are designed to promote and foster the academic and personal success of American Indian 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 introduces these new students to UND by serving as an information and resource center.

Services are provided to assist students in their transition to the University through the student support and student academic service components at AISS. The student support component provides both academic and personal advisement. AISS will also assist 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 Retention Program is a student success program for American Indian freshman and transfer 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 the American Indian student at UND. Students are encouraged to utilize the tutoring services, free of charge. Tutors are available on a daily basis in Math, Natural Sciences, Physics, Chemistry, Indian Studies, and writing assistance. AISS also sponsors study skills, time and money management, and writing workshops. The American Indian Student Learning Lab provides opportunities for students to enhance their computer skills.

The American Indian Center itself houses AISS and the Student Learning Lab. The American Indian Center serves as an academic and social gathering area for American Indian 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.

ART MUSEUM
(see North Dakota Museum of Art)

ATHLETICS
(see Intercollegiate Athletics)

AUDITORIUM
(see Chester Fritz Auditorium)

CAREER SERVICES
280 McCannel Hall
Phone (701) 777-3904

Career Services’ goal is to guide students in preparing, planning for and carrying out their career goals and to provide 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. Cooperative Education, a component of Career Services, works with employers and academic departments to provide opportunities for students to combine course work with practical, professional employment in their chosen fields.

The Career Services office coordinates activities such as on-campus interviews, provides specialized workshops, and holds three Career Fairs annually. The resource library houses labor market information, audiovisual materials, company literature, computerized job information systems, and direct on-line access to the Internet.

Students in all disciplines are encouraged to register. Registration is done on-line via the Career Services homepage. Once registered, students will have access to job openings, become available to employers searching the data base, and be able to sign up for Cooperative Education opportunities and on-campus interviews.

CEREMONIES AND SPECIAL EVENTS, OFFICE OF
309 Twamley Hall
Phone (701) 777-2724

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, activities for UND Presidential Scholars, Student Graduation Expos, and groundbreakings and dedications of campus buildings. The Office also provides leadership for planning activities held to celebrate special UND milestones and traditions, including the University’s upcoming 125th anniversary. The Office coordinates special projects as requested by the President or Vice President for Student and Outreach Services. 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.

CHILDREN’S CENTER, UNIVERSITY
525 Stanford Rd.
Phone (701) 777-3947
www.housing.und.edu/ucc

The University Children’s 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 two to five years old. The Center is open five days a week from 7:00 a.m. to 5:30 p.m. during the UND academic year and summer session. Children in kindergarten through fifth grade (age 12) are also served in the Center during the summer. Daily attendance is limited to a full-time equivalency of 103 children, with no more than nine children being cared for by one teacher.

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 or teaching assistant to develop programming for children.

The University Children’s center provides experiential learning opportunities for UND students. All Early Childhood Education majors 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.housing.und.edu/ucc, or write to the University Children’s 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’s mission is to link 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 missions, and develops relationships with public and community partners. This Center houses two main activities:

- **Experiential 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.

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 as well as graduate and undergraduate education opportunities. Last year the OCMEO office had over 10,000 participants in over 550 programs throughout North Dakota. The program is an important link for life long continuing medical education opportunities.

COUNSELING CENTER
200 McCannel Hall
Phone (701) 777-2127

The University Counseling Center (UCC) offers a variety of programs and services for University students. It is a resource which provides assistance in solving personal problems, making career choices, addressing substance use or abuse issues, developing educational skills, and reaching academic goals.

You can request UCC services by calling (701) 777-2127 or by visiting 200 McCannel Hall during regular business hours: 8 a.m. to 4:30 p.m., Monday through Friday. Initial appointments are typically set within one week. You can also walk-in for a one-time appointment on urgent matters from 10 a.m. to 12 p.m. and from 1 to 3 p.m., Monday through Friday. Sessions after that would be scheduled in the normal way. Limited evening hours and services are also available both at the UCC and at the Apartment Community Center. Please call the main number for current office hours.

Most UCC services are covered by your student fees. Exceptions will be brought to your attention: they typically apply to testing fees or court ordered evaluations. All contacts are confidential. Specific UCC services include the following:

Individual Counseling and Therapy. UCC offers counseling for individuals and couples in an effort to meet a variety of personal-social, career and academic needs. Students seek assistance for a number of reasons: developing a sense of competence in a new environment, meeting increased academic or social demands, making career decisions, resolving interpersonal conflicts, and adjusting to the University. Specialized counseling is available through our Suicide Intervention Team (SIT) as well as the Eating Disorders Interdisciplinary Team (EDIT).

Testing Services. The administration of the College Level Examination Program (CLEP) and numerous graduate or professional school entrance examinations (GRE, LSAT, etc.) are done by Testing Services. In addition, the administration and interpretation of career, self-assessment, or ability inventories is available through UCC. There may be a small charge for some of the tests and assessment instruments.

Career Counseling Services. Career Counseling Services offers assistance to help UND students make informed and satisfying decisions about career and educational goals. Counselors are available for students who want personal, on-going career counseling. Students may opt for individual career counseling for a variety of reasons including increasing stress or anxiety about career decision making, returning to school, making a career change, and balancing multiple roles and responsibilities.

Substance Abuse Prevention Office. The Substance Abuse Prevention Program offers presentations, workshops, or personal sessions to students at the University of North Dakota. Our goal is to educate and empower students to make healthy decisions. Presentations are offered by the Substance Abuse Prevention Specialist and/or UND Peer Educators (Adapt Team) who are undergraduate students that are trained as Certified Peer Educators. They also provide alternative activities on campus such as Speed Dating, Mocktails Bar events and Fall Fest events. UND Peer Educators’ offices are located at the University Counseling Center and the Student Wellness Center. You can reach a UND Peer Educator at 701-777-4165 or the Substance Abuse Prevention Specialist at 701-777-4188.

Groups and Workshops. The group counseling and workshop program provides small group experiences and workshops in skill development and personal growth. Issues and concerns addressed by this activity include assertiveness, career and personal exploration, stress management, eating disorders, relationship skills, and drug and alcohol awareness. Frequently, groups are held at areas other than the UCC. The offerings vary depending on the current needs of UND students. Use the UCC website (www.ucc.und.edu) or call the main telephone line to determine current offerings in this area.

Internship Training. The UCC is committed to the training of future counselors and psychologists through its comprehensive training programs. UCC is a training site for Counseling masters interns, and Clinical and Counseling Psychology doctoral fieldwork students. The North Dakota Psychology Internship Consortium (NDPIC) is administered through the UCC and, in collaboration with the Northeast Human Services Center, Department of Counseling, and Psychology Department, provides pre-doctoral training of psychologists from APA psychology programs across the nation. NDPIC is an Association of Psychology Postdoctoral and Internship Centers (APPIC) member site. Each trainee is supervised by a senior staff counselor or psychologist while at the University Counseling Center. Trainees also work in a supervisory capacity to one another through case conferences, training seminars and individual supervision. It is the aim of the University Counseling Center training program to assist each trainee to develop professionally, ethically and therapeutically, so that she or he becomes a competent service provider.

Outreach. The UCC staff will provide presentations on a variety of mental health topics. Any campus group or class (including the cultural centers, housing and Greek organizations) may request an event by calling 777-2127. Please call at least two weeks in advance.

DEAN OF STUDENTS OFFICE AND ASSOCIATE VICE PRESIDENT FOR STUDENT SERVICES
180 McCannel Hall
Phone (701) 777-2664

The Dean of Students Office assists current and prospective students in meeting various needs and also serves as a liaison among the diverse populations of students, faculty, staff, the UND community, the state, and the region. The Dean of Students Office personnel enhance and support the educational experience of students by identifying needs and providing tools and opportunities for students to learn and grow in a community which honors scholarship and respects differences in thought and appreciation of individual differ-
ences. The Dean of Students Office personnel provide support of the various constituencies through consultation with faculty, students, and staff. Students are treated as responsible citizens capable of making decisions for themselves and taking responsibility for their actions and decisions. The Associate Vice President for Student Services provides assistance to the Vice President for Student and Outreach Services in areas of planning, budgeting, and professional development and training for the Student Services Division.

The Dean of Students Office provides the following services:
- Advocacy for Student Issues
- Student Judicial Affairs
- Initiation of Programs
- Special Circumstance Late/Drop Withdrawal from UND
- Programs to Increase Student Satisfaction

**DISABILITY SUPPORT SERVICES**
190 McCannel Hall
Phone (701) 777-3425 (Voice or TTY)

UND recognizes its responsibility for making reasonable accommodations/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.

Disability Support Services (DSS) provides accommodations, collaborates with faculty on providing reasonable accommodations and consults with UND personnel about making all other UND programs and services accessible.

Students planning to use accommodations must complete a DSS application and submit current documentation of disability. DSS will verify their eligibility and identify the accommodations they will be authorized to use on a semester by semester basis. For more information, contact DSS or check the DSS web site at: http://www.und.edu/dept/dss/.

**ENROLLMENT SERVICES, OFFICE OF**
100 Carnegie Hall
Phone (701) 777-4463
(701) 777-3367 TTY Service Only

The Office of Enrollment Services is the central contact point for dissemination of enrollment information about the University of North Dakota. The primary mission of Enrollment Services is to inform, counsel, and assist prospective students regarding admission, housing, academic programs and campus procedures. The office provides tours of campus as well as sends general information and applications for the University. Additional information about visiting campus may be found in the Visitor Information and Campus Visits sections.

**EXTRACURRICULAR OPPORTUNITIES**

As a complement to classroom instruction, individual colleges and departments, residence halls, fraternal organizations, Student Government, University Program Council, and other groups sponsor programs of social, cultural, educational and physical activities which contribute to the personal growth of students at the University. Involvement activities provided by various departments and organizations include games and sports, social functions, dramatics, dances, music, films, lectures, and other programs throughout the year. In addition, students may choose to participate in over 200 recognized student organizations, which are formed around academic pursuits, politics, cultural, religion, service and other interests.

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

**FINANCIAL AID OFFICE**
(see Student Financial Aid Office)

**FOOD SERVICE**
(see Residence Services)

**FRATERNITY AND SORORITY MEMBERSHIP**

Twelve national social fraternities and six national social sororities maintain houses adjacent to the campus in which residence and, in some instances, dining facilities are available to members. Costs for room and board are approximately $4,000 (low end average) per year. There are other costs, such as dues and initiation fees, which also vary.

Eligibility for membership in a fraternity or sorority is a mutually selective 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.

Greek life affords the student 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 Coordinator of Greek Life in the Memorial Union by calling (701) 777-3667 or by emailing greeklife@und.nodak.edu, or check out our web site at: http://www.union.nodak.edu/involvement/greeklife.

**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 the General Counsel and the Associate 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. This 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)

**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 of former Boy Scout members.
- 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 Pi Epsilon (1963) is the national honorary graduate fraternity for students of superior scholastic achievement in business education. 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 School 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. Golden Key National Honor Society (1996) recognizes and awards academic achievement for upperclassmen. International Honorary for Leaders in University Apartment Community (HIUAC) recognizes exceptional apartment leaders. Lambda Pi Eta (2005) is a national honor society for students in the field of communication. Magna Iota provides social as well as academic outlet for graduate students in the counseling department. Mortar Board (1932) aims to foster the ideal of service and to promote leadership and scholarship. National Residence Hall Honorary (NRHH) recognizes and elects to membership the top 1% of the most involved residence hall student leaders. 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 the Center for Teaching and Learning 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 Omega Pi (1951) aims to promote scholarship in business education. 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 Alpha Iota (1916) endeavors to uphold standards of music education. 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. Sigma Theta Tau International, Eta Upsilon (1984) promotes and supports scholarship, leadership, and research in nursing. Sigma Xi (1919) chooses its members from the faculty and graduate students on the basis of their aptitude in scientific research. Undergraduates are eligible for associate membership. (National) Society of Professional Journalists (1922), formerly Sigma Delta Chi, encourages the maintenance of high standards for journalists. (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 School of Engineering and Mines. Tau Sigma (2005) is a national honorary that recognizes academic excellence of transfer students. Upsilon Pi Epsilon (2006) elects to membership a limited number of outstanding students in computer science.

HOUSING

(see Residence Services)

HUMAN RESOURCES, OFFICE OF
313 Twamley Hall
Phone (701) 777-4361

The Office of Human Resources supports a fair and equitable work environment by providing management and development training to supervisors and staff, a fair and effective salary administration program, a broadbanding program including market data information, advisement on policies and procedures on wage and employment regulations, an effective performance management program, and successful staff recognition programs. These services contribute to the mission of the University by the recruitment, retention and development of a qualified work force.

The Office of Human Resources adheres to the University’s equal opportunity/affirmative action policies. Additional information on employment at the University may be obtained from the Office of Human Resources, 264 Centennial Drive, Stop 8010, Grand Forks, ND 58202; telephone (701) 777-4361; e-mail humanresources@mail.und.nodak.edu; or visit our web site at: http://www.humanresources.und.edu. The Office of Student Financial Aid should be contacted by students seeking part-time employment.

ID CARD/U CARD
(see Residence Services)

INFORMATION TECHNOLOGY SYSTEMS & SERVICES (ITSS)
Upson Hall II
Phone (701) 777-3171
http://itss.und.edu

ITSS is a member of the North Dakota Higher Education Computer Network (ND-HECN) which provides faculty, staff, and students the ability to communicate around the globe via electronic mail, access the Internet, run statistical and programming languages, as well as supplement research by examining databases and current information throughout the world.

ITSS services and support at UND include computer clusters and labs running general purpose software and office suites, training workshops, manuals, newsletters and documentation, microcomputer consulting, local area network (LAN) consulting, electronic mail, Internet access, software site licenses, telecommunications, and network services.
The Help Desk provides a single contact point for users who need help with computing problems or questions. Services include problem determination, assistance, resolution and answers to users’ common computing questions. Contact the Help Desk by telephone (701) 777-2222, e-mail (ITSSHelp@mail.und.edu), submit problems via the Remedy web page (http://www.helpcenter.nodak.edu), or visit in person (Upson II, Room 366 from 8:00 a.m. - 4:30 p.m.). The Help Desk telephone is answered from 5:00 a.m. to 12 a.m., seven days a week. Most forms needed to request access to any NDHECN or UND system are available on the ITSS web page (http://itss.und.edu), at the reception counter in the ITSS office, or call the Help Desk for further information.

Center for Instructional & Learning Technologies (CILT)/ITSS provides services and support drawing on expertise in both technology and pedagogy. Services include: administration of the campus Blackboard Learner Management System; workshops, forums, and seminars; course development and redesign; graphics and photography; instructional design; project consultation and support; web page design; web application design and development; presentation development; technology management and support for general purpose classrooms; classroom design for general purpose and discipline specific classrooms; and video production services, including classroom video recording, digitizing and duplication of audio and video. The Center provides support to the faculty while sharing resources on effective and best practices. Through programming and support, faculty can experience an environment where innovation is encouraged to discover and explore new ideas, acquire new skills, and develop materials to enrich instruction.

Telecommunications/ITSS provides telephone services to the university community. Student Services include: Dial Tone (UND apartments, residence halls and some Greek houses), Telephone Repair Service, Long Distance Services, Voice Mail and a newsletter. Please see our web page for policy statements regarding UND apartments, residence halls and Greek houses.

Administrative Services include: Dial tone, Telephone Repair Service, Long Distance Authorization Codes and AT&T Calling Cards, Voice Mail, Cellular Telephones, Video Conferencing, Audio Teleconferencing and Emergency Phones (located in various locations across campus).

Telecommunications/ITSS also provides training and other assistance with telephone etiquette and telephone, voice mail and long distance use for the university community.

INSTRUCTIONAL DEVELOPMENT, OFFICE OF
409 Twamley Hall
Phone (701) 777-3325

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 in curriculum and instruction, recognizes 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 and lunch discussion groups, offers consulting to individual faculty and departments, and provides other teaching-related services to UND faculty. OID also serves as the administrative home of the Writing Across the Curriculum program.

The Office of Instructional Development is located in Twamley Hall, Room 409. Phone (701) 777-3325. E-mail: oid@und.nodak.edu, Web site: http://www.und.nodak.edu/dept/oid/.

INSTRUCTIONAL LEARNING TECHNOLOGIES/ITSS,
CENTER FOR (CILT)
http://www.cilt.und.edu
Robertson-Sayre Hall
Phone: (701) 777-2129

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, and swimming and diving. The women’s program includes competition in basketball, cross country, golf, track and field, swimming and diving, soccer, hockey, softball, tennis, and volleyball. Many club and intramural activities are also available.

General policies are determined by the president and the faculty and students of the university. 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 athletic 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 self discipline and cooperation. The competitive events themselves provide recreation and entertainment for the entire student body and contribute toward the development of student loyalty and morale.

INTERNATIONAL PROGRAMS, OFFICE OF
International Centre, 2908 University Avenue
Phone (701) 777-6438
FAX (701) 777-4773
internationalprograms@mail.und.nodak.edu
http://www.und.edu/dept/oip

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 to 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 25 universities in 17 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 located in the International Centre. Office staff is available from 8 a.m. to 4:30 p.m. The International Centre is open daily from 8 a.m. to 10 p.m. Weekend and holiday hours may vary. Computers, comfortable study space, coffee, and tea are always available. All are welcome.
LEARNING CENTER, UNIVERSITY
201 Memorial Union
Phone (701) 777-4406

The University Learning Center provides a wide range of educational skills assistance for university students. Professional staff members are available to work with students on an individual basis to assess and identify learning strengths and needs.

Academic assistance is available through the following services:
(1) free drop-in tutoring; (2) individual assistance with learning concerns; (3) assessment of test anxiety, learning styles and reading comprehension; (4) computer assisted instruction along with study skills workshops and development seminars, and two-credit courses (UNIV Intro to Effective Study Skills, Critical Thinking Strategies, and College Reading. The University Learning Center is committed to maximizing the lifelong learning potential of all students.

The University Learning Center accepts applications for peer tutors throughout the year. The Center’s hours are: offices, M-F, 8am-4:30 p.m. for consultation with students, staff, and faculty; and the Drop-In Tutoring Lab is open M-Th, 10am-8pm.

LEGAL COUNSEL
(see General Counsel)

LIBRARIES

The University of North Dakota supports the largest and oldest library system in the state of North Dakota. With holdings numbering over 3 million items, the UND libraries are a major resource for students and researchers on campus, in the State, and through the University’s distance education network. The University’s library system includes the Chester Fritz Library and branch libraries (Energy & Environmental Resource Center, Geology, and Music), and 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 include significant collections in the humanities, social sciences, science and technology, education, business, and the fine arts. It is also a major depository for state and federal documents. The Chester Fritz Library administers the only U.S. Patent and Trademark collection in the state. The Library’s Elwyn B. Robinson Special Collections include published works 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 acquire informational resources not held locally. The libraries’ Interlibrary Loan departments will help students obtain materials from other libraries for their use at UND.

The libraries provide educational services including reference assistance and instructional sessions. Librarians are available for individual consultation in the libraries as well as presentations in the classrooms.

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

MEMORIAL UNION
Phone (701) 777-3926
Info Center (701) 777-4321
TTY (701) 777-4482

The Memorial Union provides a host of programs and services to the University community, including meeting rooms from small to ballroom size with teleconference and audio-visual amenities. Space in the Union for meetings or displays (tables or cases) may be reserved by calling Event Services at (701) 777-3928 or in person at the Union administrative offices located on the third floor. Another popular service offered at the Union is the Info Center, which has information on most campus events and services on a walk-up or phone-in basis (701) 777-4321.

Retail services in the Memorial Union include: Union Services, which offers a full-service photocopying center, binding, check cashing, newspapers, and discount movie tickets; Sign & Design, a one-stop-shop for design, large-format printing, banners, posters, signs, certificates, pictures (canvas or photo), laminating and mounting; Lifetime Sports Center offering billiards, arcade games, and recreational/outdoor equipment rental. Other retail services include: Great Clips, Campus Barbers, and the University Federal Credit Union. Food service options include: Old Main Marketplace (Sharro Pizzaria, A&W, Dakota Deli, World Market), Stomping Grounds (coffee and bakery items), U-Snack (convenience store), Terrace Dining Center, and Campus Catering.

Leadership and personal development, as well as advising of campus organizations, are provided by the Center for Student Involvement and Leadership, which includes offices for the coordinators of Student Organizations, Greek Life, and Volunteer Services. Services for non-traditional students are available at the Adult Re-Entry Student Services office, located on the third floor.

Other services and programs located in the Union are Student Government, University Learning Center, Student Academic Services, Student Health Promotions Office, Traffic Division (parking permits/services), U Card Office (student ID), Campus Post Office, Athletic Ticket Window, Computer Lab, Internet Cafe, The Loading Dock (multi-purpose entertainment lounge), and a variety of study, TV and lounge spaces.

Adult Re-Entry Center

The Adult Re-Entry Center is a place where nontraditional students can find assistance as they navigate the many challenges of college life. Prospective students will find a supportive atmosphere for information and re-entry assistance. Students and/or prospective students can get information at the website: www.union.und.edu/reentry, or by contacting the coordinator of Adult Re-Entry Student Services at (701) 777-3228. Information on programs and services can also be found at the Adult Re-Entry office located on the third floor of the Memorial Union in Room 327.

Volunteer Opportunities

Students are able to add to their educational experience by participating in volunteer opportunities. By volunteering, students are able to explore potential careers, give back to their communities and build relationships with other students, staff, faculty members and community leaders. Volunteer Bridge, a clearing house for volunteer opportunities, is available for those students interested in community service. Students may locate a variety of volunteer opportunities available in the Greater Grand Forks area and on the UND campus by electing to receive the Volunteer Bridge newsletter, viewing the opportunities on the web at: http://www.union.und.edu/volunteer, or by contacting the coordinator of Civic Leadership at (701) 777-4076. Information on volunteer opportunities can also be found in the Volunteer Bridge office in the Center for Student Involvement and Leadership in Room 113A of the Memorial Union.
MULTICULTURAL STUDENT SERVICES
2800 University Avenue
Phone (701) 777-4259

Multicultural Student Services (MSS) provides quality support services (academic, financial aid, personal, and social) which will enhance African American, Asian American, and Hispanic American student success at the University of North Dakota. MSS serves as a general institutional contact and advocate for students, individually and collectively, and works with UND departments and offices to address the unique needs of students. The director provides advice and counsel regarding broad campus issues and promotes diversity throughout the campus while enhancing diversity in the Grand Forks and Grand Forks Air Force Base communities as well as on the UND campus.

MUSEUM OF ART, NORTH DAKOTA
261 Centennial Drive
Phone (701) 777-4195

The North Dakota Museum of Art, founded in 1972, is both the official art gallery of the State of North Dakota and 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 sculpture, painting, ceramics, photography, jewelry and other art forms change every six weeks. 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 and Museum Shop hours are Monday through Friday, 9 a.m. to 5 p.m., and Saturday and Sunday, 11 a.m. to 5 p.m. There is no admission charge.

RADIO, UND
314 Cambridge
Phone (701) 777-2577

The University owns two FM radio frequencies, 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.

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 70 team, individual or dual events each year in men’s, women’s, open, and coed divisions.

Sports and activities include: badminton, basketball, volleyball, sand volleyball, broomball, golf, ice hockey, in-line hockey, racquetball, indoor soccer, softball, tennis, 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, Ray Richards Golf Course, Hyslop Sports Center, Aviation Foundation Property, Ulland Park, and other Grand Forks Park District properties throughout the city.

In addition to competitive organized play, RecSports provides opportunities for students, 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 enhance the campus climate and enrich the quality of life for the University of North Dakota community by embracing all dimensions of Wellness.” For more information, check us out on the web at: www.wellness.und.edu/recsports, 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

Campus Ministry Association includes Christus Rex Lutheran Campus Ministry (the Evangelical Lutheran Church in America), Wittenberg Lutheran Chapel (the Lutheran Church Missouri Synod), and St. Thomas Aquinas Newman Center (Catholic Campus Ministry). Each ministry has a chapel on campus which holds regular worship services and has at least one full-time staff person. United Campus Ministry, representing the American Baptist, Episcopal, Presbyterian (U.S.A.), United Church of Christ and United Methodist churches is also a member of this association, but worship is offered in area congregations. The programs that all of the ministries offer includes worship, fellowship, Bible study, Christian education, service to the community and UND student organizations, Lutheran Student Movement, Lutheran Student Fellowship and FOCUS (Fellowship of Catholic University Students.)

RESEARCH DEVELOPMENT AND COMPLIANCE
105 Twamley Hall
Phone (701) 777-4278

Research Development and Compliance (RD&C) collects and disseminates information regarding research programs sponsored by federal agencies, state agencies, foundations, and industrial organizations. Research program information that may be of interest to UND faculty, students, and staff are distributed widely throughout the campus. The RD&C staff provide application materials, identify potential funding sources, and assist with proposal planning and development.

The Associate Vice President for Research in RD&C is the official authorized by the University to sign all proposals submitted to external agencies. Before proposals are submitted to RD&C for administrative review, the proposed budgets are checked and approved for compliance with the financial policies of funding agencies by Grants and Contracts Administration (GCA). The signing official is
responsible for providing requested certifications and assuring compliance with policies and regulations required by the Federal government and other funding agencies. These policies and regulations involve human subjects, animal care and use, copyrights, intellectual property, radioactive materials 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 Faculty Research Seed Money Council, the Associate Deans for Research 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 Senate Conflict of Interest/Scientific Misconduct Committee.

RESIDENCE SERVICES
(Dining Services, Housing, U Card)

Dining Services
3625 Campus Road, Stop 9033
(701) 777-3823
www.dining.und.edu/

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 Hall, 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 a 10, 14, or 19 meal-per-week plan, or unlimited access meal plan. Off-campus students, faculty and staff may pay cash or purchase special meal plans. Nutritional analysis of the daily menu served in the dining centers is available online at: www.nutrition.und.edu.

Many retail locations across campus offer a wide selection of affordable dining options. Old Main Marketplace in the Memorial Union features A&W Express, Sbarro Pizzeria, Dakota Deli (soups, sandwiches and wraps featuring North Dakota products), and Rio Rojo Mexicana. Stomping Grounds Coffee Shop in the Memorial Union serves Seattle’s Best coffee, espresso, specialty coffee drinks and features fresh baked items from the UND Bakery. Find fresh fruit smoothies and sandwiches at “The Well,” a juice and snack bar located in the atrium of the Wellness Center. A Subway sandwich shop is located in Johnstone Hall. Find hot entrees and grab n’ go breakfast and lunch items at all three campus snack bars, located in Twamley Hall, the Medical School, and at the UND Administrative Aerospace Center, Airport.

Convenience stores are located in Wilkerson Hall, Walsh Hall, 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.dining.und.edu or by calling the administration office at (701) 777-3823.

Housing
525 Stanford Road, Stop 9029
Phone (701) 777-4251
www.housing.und.edu

The Housing Department supports the academic mission of the University by providing comfortable, affordable and well-maintained accommodations to meet the changing needs of students. Student living facilities at the University of North Dakota include residence halls, apartment style housing, and apartments for single students and families.

University Residence Halls

Residence halls are designed to provide a comfortable, diverse living environment for students while they are enrolled in the University. A solid network of nationally recognized residence hall staff works to enhance the personal and social development that complements the out-of-classroom experience. UND has 15 residence halls which are conveniently located throughout campus. All halls have laundry facilities, kitchenettes, study areas and access to the residence hall fitness center. Individual rooms have cable TV service and direct connection to the Internet. Students must be enrolled at UND with a minimum of 12 credits to live in the residence halls. Complete information may be obtained by visiting the web site at: www.housing.und.edu, or by contacting the Housing Office, University of North Dakota, 525 Stanford Road, Stop 9029, Grand Forks, ND 58202-9029, (701) 777-4251.

Applications. Applications are available from the Enrollment Services Office, the Housing Office, or on-line at: www.housing.und.edu. 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 Board Contract. Residence hall room and board contracts are for the entire academic year (fall and spring semester), fall semester only, spring semester only, or summer session. Students will receive a copy of the contract containing cancellation dates and refund policies for the year in which they are applying. The contract is revised annually. Rates will be sent to all students following approval by the UND President’s Office. The cost of a double room with a 19-meal (per week) board plan was $5,085 for the 2006-07 academic year. Room and board rates are revised annually and are subject to change. A student vacating his or her assigned room before the end of his or her contract term will be held responsible for the entire charges of the contracted period. Naturally, in case of illness, or other special reasons, consideration is given. A student whose registration is cancelled for any reason is required to vacate.

Facilities. All residence halls include desks, single beds (mattresses are 36” x 80”), dressers, chairs, bookshelves, drapes, and wastebaskets. Students will need to bring bed linen, blankets, study lamps, towels, bedspreads, and pillows. Mail service and telephone lines are provided; however, the student will need to bring his/her own phone. Data connections are available in every room. Dakota Hall has wireless network access. Currently, there are over 30 wireless access points located in lounge areas within the residence halls. For a list of wireless access points, visit www.resnet.und.edu.

Living and Learning Communities. Residence hall students may opt to be part of a theme oriented housing option where students who share similar interests live together, enroll for similar courses, and learn together. The following are the Living and Learning Communities in the residence halls: Honors Community (Fulton Hall); Wellness Community (Brannon Hall); Society and Men/S.A.M. (Walsh Hall); and American Indian Student Services/A.I.S.S. (Brannon Hall).

University Apartment Style Housing

Apartment-style housing is a new and innovative housing option for students. Scheduled to open in August 2007, this contemporary living environment is designed to cater to single students’ independent lifestyle and need for more personal space and amenities. The apartment units are designed with two unique floor plans for four students, including both single and double occupancy bedroom options. Each unit is furnished and includes a shared living room and kitchen area complete with a dishwasher, stove, refrigerator, and
microwave. All units have air conditioning, security, and UND computer network access, including wireless.

The building accommodates 270 residents and features a first floor coffee shop for the campus community with drive-up access. Residents must have 30 credits to be eligible for occupancy. Students must remain enrolled at UND with a minimum of 12 credits/semester to live in this building. Contract length options include academic year or full term. Residents are not required to have a meal plan. Complete information and rates may be obtained by visiting the website at: www.housing.und.edu or by contacting the Housing Office, University of North Dakota, 525 Stanford Road, Stop 9029, Grand Forks, ND 58202-9029 (701)777-4251.

University Apartments

The University manages approximately 800 apartments for families and single students. Residents have access to the University Children’s Center (childcare) and enjoy a variety of social and cultural events at the University Apartment Community Center. Applications and information about the specific types of apartments and current rates are available on the web at: www.housing.und.edu 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.

Each college is allocated a limited number of assignments for GTAs/GRAs/GSAs. To qualify, eligible graduate students must be recommended for an assignment by the dean of their respective college. Assignments will be made subject to availability.

Single Student Apartment Housing

The University maintains furnished and unfurnished apartments and sleeping rooms for single students. Leaseholders must be senior, graduate level, or 23 years of age or older. Rental rates on these units ranged from $355-$688 for the 2006-07 academic year. In most cases, the rent includes heat, water, garbage removal, and basic cable TV (electricity and telephone not included). DSL (Digital Subscriber Line) which gives residents access to the University computer network, is available for a fee.

Family Student Apartment Housing

The University maintains several hundred apartments for families. These apartments are located on the west side of the campus and include one, two, and three bedroom units. Rental on these units ranged from $355-$688 for the 2006-07 academic year. In most cases, the rent includes heat, water, garbage removal, and basic cable TV (electricity and phone not included). DSL (Digital Subscriber Line) which gives residents access to the University computer network, is available for a 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, individuals must have a commitment from the Dean of their college for one of that college’s annual faculty housing allocations.

Off-Campus Housing

Students who wish to live off campus must contract for such facilities themselves.

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, and athletic events.

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. Students can also use the Valumart machines to deposit cash into their debit account. Complete information about the U Card is available at the website: www.ucard.und.edu.

SPEECH, LANGUAGE AND HEARING CLINIC

Montgomery Hall
Phone (701) 777-3232

The Department of Communication Sciences and Disorders offers clinical evaluations and treatment for individuals with speech, language, and hearing disorders. These services are provided by faculty or by graduate students under the supervision of certified speech-language pathologists and audiologists. The program in Speech-Language Pathology is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association.

The Speech, Language and Hearing Clinic provides a program of on-going evaluation and treatment services on an outpatient basis. Moderate fees based on a sliding scale are charged for this service. Some of the specific services provided are evaluations of all types of speech and language disabilities, and hearing problems and evaluations for hearing aid candidacy. Treatment is also provided in all of these areas. The Clinic also provides tutoring services to assist individuals learning English as a second language. For additional information or to make an appointment, call the Speech, Language and Hearing Clinic.

STUDENT ACADEMIC SERVICES

Room 201, Memorial Union
Phone (701) 777-2117
FAX (701) 777-3397
sas@und.nodak.edu
http://sas.und.edu/

Student Academic Services assists deciding freshmen and transfer students in the development and implementation of their educational plans and goals.

By providing quality academic advising for all students deciding on a major, the staff within Student Academic Services is committed to offering the opportunities necessary for student success at the University. Student Academic Services takes a leadership role in the facilitation of programs and services that promote first-year student success.

Professional academic advisers assist students in exploring their educational and career goals as well as providing academic and personal support. Student Academic Services coordinates the initial registration for all new freshmen and transfer students through programs called Getting Started. The Keep Going program, coordinated through Student Academic Services, is designed to assist new students in a smooth transition from fall to spring semester.

STUDENT AND OUTREACH SERVICES,
DIVISION OF

307 Twamley Hall
Phone (701) 777-2724

Under the direction of the Vice President for Student and Outreach Services, a number of services, programs, and activities are available to assist students. Students needing assistance or informa-
tion 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 and Outreach Services, 307 Twamley Hall, phone 777-2724.

The University of North Dakota Division of Student and Outreach Services provides leadership through comprehensive and inclusive student support services and educational opportunities designed to enhance the overall development of lifelong learners, and by extending University resources to all constituents.

**STUDENT FINANCIAL AID OFFICE**

216 Twamley Hall  
Phone (701) 777-3121  
sfa@mail.und.nodak.edu  
www.financialaid.und.edu

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

Financial assistance is available to assist students with temporary emergencies as well as to provide long term funds for financing a college education. Students are offered financial assistance in various forms, including scholarships, grants, employment, and loan programs. The Student Financial Aid Office maintains a listing of both on- and off-campus part-time jobs. 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 a full-service medical clinic located in the heart of campus. It is staffed by licensed physicians and other professional staff and provides medical evaluations, treatment, laboratory, x-ray and pharmacy services, and health education/promotion programs. It is designed to meet the health needs of all enrolled students. Students are not charged for office calls, which are covered by the student fees paid each semester. The student will be charged for laboratory and x-ray services, medications, and for special examinations including, but not limited to, FAA medicals and pre-employment physicals. All charges are billed through the University Business Office; however, insurance claims will be filed for those who present an insurance card. Pharmacy claims will also be filed for participating insurance plans. Spouses of enrolled students may also use the Health Service for a per-semester fee.

Office hours are Monday through Friday, 8 a.m. to 4:30 p.m. by appointment. To make an appointment call 777-2605.

**SUBSTANCE ABUSE PREVENTION OFFICE**

Student Wellness Center/University Counseling Center  
801 Princeton St./202 McCannel Hall  
Phone (701) 777-4188  
UND Peer Educators (701) 777-4165

The Office of Substance Abuse Prevention provides a framework for campus prevention programming. The Office offers assistance to individuals, groups, and UND organizations in researching the affective and behavioral dimensions of alcohol and other drug usage among students. The staff implements programming which encourages students to make healthy decisions. The Office also coordinates and collaborates with multiple local agencies and organizations for assessment, planning, and implementation of prevention initiatives on UND Campus. The UND Peer Educators (Adapt Team) provides a variety of wellness related presentations for UND students, offers various alternative activities on campus locations and serves as an educational resource for students and faculty.

**TELECOMMUNICATIONS/ITSS**

http://www.und.edu/dept/telecom/  
Carnegie Building  
Phone: (701) 777-4112

(See Information Technology Systems and Services/ITSS)

**TELEVISION CENTER**

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

**Mission:** The University of North Dakota Television Center is a division of UND Continuing Education. The 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.
- Support broadcast courses offered through the School of Communication.
- Provide high quality, innovative, and cost-effective production services to clients.
- Schedule and operate Grand Forks Cable Channel 3 and UND Cable Channel 17, 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 computer graphics and digital effects.
- Remote Production: one-camera production with special lighting effects.
- Editing: post-production services with computer graphics system, 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 2.5 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 and UND Cable Channel 17, Residence Life Cinema. It is repeated several times during the week in the following North Dakota cities: Grand Forks, Fargo, Minot, Bismarck and Mandan. 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 Colorado can watch through the Denver Community Television Network.

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

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

**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; and career exploration. Students also receive assistance securing appropriate financial resources. A variety of resources are available for students as they develop self-reliance, independence, and academic success.

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

  **U CARD/ID CARD**

  (see Residence Services)

**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 the “UND Discovery” and “UND Dimensions,” 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.

**VETERAN SERVICES**

- **211 Twamley Hall**
- **Phone (701) 777-3363**

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.

**WELLNESS CENTER**

- **801 Princeton Street**
- **Phone (701) 777-WELL (9355)**

Opened September 2006, the new Wellness Center 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 student 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 Burnt Toast demonstration kitchen, where members can learn how to cook healthy and nutritious meals, the Hopper-Danley Memorial Quiet Lounge for meditation, and massage therapy to ease the stresses of life. Other main attractions are the hand-sculpted rock wall and high-energy spin 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 for information on recruitment sessions. Apply to “ignite your spirit” with the UND Wellness Center.

If you have any questions, feel free to contact us at any time by going to: www.wellness.und.edu, or by calling 777-WELL. Let us be part of your collegiate experience!

**WOMEN’S CENTER**

- **305 Hamline Street**
- **Phone (701) 777-4300**
- **Fax (701) 777-2307**
- **undwomenscenter@und.nodak.edu**
- **http://www.und.nodak.edu/dep/womenctr**

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

**UNIVERSITY WRITING PROGRAM/Writing Across the Curriculum**

12A Merrifield Hall  
Phone (701) 777-3600  
[http://www.und.edu/dept/oid/wac.htm](http://www.und.edu/dept/oid/wac.htm)

The University Writing Program is designed to encourage and support student and faculty involvement with writing, both as a means of communication and as a mode of learning across the curriculum. The program sponsors workshops and seminars for faculty in all disciplines, offers free consultation services to students and faculty, and serves as a clearinghouse for information and materials on teaching with writing.

The University Writing Program also assists in the development and support of writing intensive courses designed to fulfill the general education Communication requirement.

**WRITING CENTER**  
12 Merrifield Hall  
Phone (701) 777-2795  
writing.center@und.nodak.edu  
[http://www.und.edu/dept/wac/](http://www.und.edu/dept/wac/)

The Writing Center offers free individualized help with writing to students and other members of the UND community. Trained consultants will work with writers at any stage in the writing process, including research, organization, revision, editing, and documentation. Handbooks and style manuals are available for those who have questions about grammar, punctuation, or format (APA, MLA, Chicago Manual of Style, Turabian, and others).

The Writing Center is open six days a week, including some weekend and evening times. Sessions are offered on a drop-in basis (as available) or by appointment. For further information, call 777-2795.
INFORMATION SOURCES

about the

University of North Dakota

Grand Forks, North Dakota

Freshman Student Applications and
Undergraduate Transfer Student Applications

Visit and Tour Arrangements

Write: Office of Enrollment Services,
University of North Dakota, Carnegie Hall, Room 100,
250 Centennial Dr., Stop 8135, Grand Forks, ND 58202-8135

ONLINE: www.go.und.edu

Telephone: (701) 777-4463
(800) CALL UND, ext. 4463
(701) 777-3367 TTY Service Only

Graduate Student Applications

Write: Graduate School, University of North Dakota
Twamley Hall, Room 414, 264 Centennial Drive, Stop 8178
Grand Forks, ND 58202-8178

ONLINE: www.graduateschool.und.edu

Telephone: (701) 777-3858
(800) CALL UND, ext. 3858
(701) 777-2947 TTY Service Only

Internet Home Page

http://www.und.edu

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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 Enrollment Services serves as the central contact point for enrollment information about the University. It provides information to prospective students through printed materials, visitations to 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 application form for admission and housing may be obtained from the Enrollment Services Office. The mailing address is: Office of Enrollment Services, University of North Dakota, Carnegie Hall Room 100, 250 Centennial Drive, Stop 8135, Grand Forks, ND 58202-8135. The office telephone number is (701) 777-4463. The application form can also be obtained on the web at: go.und.edu. As a general rule, the sooner one makes application, the better, especially if the prospective student wishes to receive the highest priority for financial aid and/or housing.

ADMISSION OF STUDENTS

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

Types of Admission

Regular Admission is granted to a student who has satisfied the entrance requirements and is duly enrolled as a candidate for a degree. A student whose entrance units are satisfactory is classified as follows, provided he or she has the hours of credit indicated: a freshman, less than 24 hours; a sophomore, 24 hours; a junior, 60 hours; a senior, 90 hours.

Provisional Admission may be granted by the Student Academic Standards Committee to degree-seeking undergraduate applicants in cases where the student shows promise to succeed but does not meet regular admissions criteria. A student admitted on provisional status must: 1) enroll in a study skills or Introduction to University Life course (unless enrolled in the Integrated Studies program); 2) limit course load to no more than 15 credits in the first semester; and 3) seek advisement two times during their first semester with a University Learning Center professional staff.

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 degree-seeking admission. Students interested in this status should fill out the Application for Admission and submit the $35 application fee.

Admission of New Freshmen

Automatic Admission. In order to be admitted to the University of North Dakota, all freshmen students must meet the following minimum criteria:

- ACT composite score of 21 or SAT combined score of 990
- Minimum high school cumulative GPA of 2.50
- Completion of the high school core curriculum

Students are encouraged to apply for admission even if their GPA and ACT do not meet these admissions standards. All applications that do not meet automatic admission will be reviewed by the Student Academic Standards Committee which will consider all relevant information and extenuating circumstances to make an admission decision that is in the best interest of the student and institution.

Students older than 25 are not required to submit an ACT or SAT score and should contact the Office of Admissions for more specific details.

Students applying for admission to UND are required to take one of the standardized college entrance exams; however, students 25 years old or older are not required to have test scores. The American College Test (ACT) or SAT I: Reasoning Test is accepted. Standardized test scores at UND are used for scholarships and advisement, as well as admission criteria. It is recommended that students take the ACT late in their junior year or early in their senior 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, in 1993 or later are required to complete a core curriculum before entering any four-year North Dakota University System Institution.

Below is the list of courses at the secondary level which are required for admission:

- 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.

Each university 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.

The Student Academics Standards Committee 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 composite score or a low SAT combined score, and/or a low high school grade point average.

Students who have not had the required courses are encouraged to enroll in any of North Dakota’s two-year colleges, which include Bismarck State College, North Dakota State College of Science, Minot State University–Bottineau, Lake Region State College, and Williston State College. Upon successful completion of 24 transferable semester credits at these campuses, students are eligible for transfer to a four-year campus. These transfer students are exempt from the high school course requirements.

Students who have not graduated from high school may be admitted to the University by completing the test of General Educational Development (GED) with a minimum score of 400 or above on each exam and an overall average of 500 on the entire test. For more information regarding GED test content and registration, contact UND Testing Services at (701) 777-4157.

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 to acquire the international student application form.
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 to be considered for admission. The International Programs Office provides assistance and counseling to students from countries other than the United States.

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.

High school special students who are currently attending high school may be allowed to enroll in University courses as special students with permission of the Director of Admissions and the student’s high school principal and counselor. A high school transcript is required along with a letter of recommendation from the high school principal or guidance counselor. 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 which would apply toward college requirements must be approved by the Dean of the College. Courses to be applied to meet major requirements must be approved by the Departmental Chair. Dual credit applications are available at the high school or NDUS.

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

Information on test dates may be secured from the high school principal, counselor, or the Counseling Center at UND 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 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 102*, 103, 104, 105, 146, 165, 208) 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 adviser 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 and/or Math 105 without taking the course(s) is available only through CLEP examinations. Two placement exams are used. Students planning to take Calculus I (Math 165) should take the Trigonometry and Elementary Functions Exam. All other students should take the Algebra Exam. Placement test results will determine beginning placement in Intermediate Algebra (Math 102*), College Algebra (Math 103), Finite Math (Math 104), Trigonometry (Math 105), Applied Calculus I (Math 146), Discrete Mathematics (Math 208), Calculus I (Math 165) or Math for Elementary School Teachers (Math 277). Ask your adviser, or contact the mathematics department, concerning time and place of these tests. *Math 102 credit does 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 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 Office of Student Academic Services. 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 Application for Admission form may be obtained from The Office of Enrollment Services, 250 Centennial Drive, Stop 8135, University of North Dakota, Grand Forks, ND 58202 or on the web at: go.und.edu.

2. All applicants are required to complete and return the application for admission to the Office of Admissions with the $35 non-refundable application fee. In addition, beginning freshmen must request that transcripts of their records at each institution attended be sent directly from the schools and colleges to the Office of Admissions.

3. The freshman applicant is required to take the ACT or SAT early in the senior year or the latter part of the junior year and request that the official scores be sent to the University of North Dakota, Grand Forks, ND 58202.

4. Each applicant must have the Measles/Rubella Form completed by his or her family physician or mailed from his/her high school. This form is mailed to each accepted student and should be returned to the Student Health Service before enrollment.

When to Apply: An applicant currently enrolled in high school may apply at any time during his or her senior year. If the student’s high school record to that time is satisfactory, the applicant will be granted admission. It is the student’s responsibility to make certain that a transcript verifying completion of the core curriculum and his or her date of high school graduation is sent to the Office of Admissions.

ADMISSION OF TRANSFER STUDENTS

Transfer students from other colleges and universities who have earned fewer than 60 semester hours of credit that are acceptable for full credit toward a bachelor’s degree must request that their high school records verifying high school graduation as well as official transcripts of their records at each institution attended be sent directly from the schools and colleges to the Office of Admissions.
Official ACT or SAT results are required for students who will not have 24 acceptable transfer credits and are under the age of 25.

Students who have declared a major will enroll in one of UND’s undergraduate degree-granting colleges. These are the College of Arts and Sciences, the College of Business and Public Administration, the College of Education and Human Development, the School of Engineering and Mines, the John D. Odegard School of Aerospace Sciences, the College of Nursing, and the School of Medicine and Health Sciences. For information on admission requirements and grade point average requirements of UND’s colleges and schools, see the specific college section. Transfer students who have an “undecided” major will receive assistance from the Office of Student Academic Services.

Applicants who have been enrolled in a college or university other than the University of North Dakota and who are applying for admission must submit complete credentials to the Office of Admissions before any information regarding their status will be given. All claims for transfer credit must be made within the semester in which the student matriculates. The Office of the University 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.

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 or 71 internet-based for undergraduate students, 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. Most Canadian universities do not require evaluations. The student will be notified if a course-by-course evaluation is needed from a Canadian university. The evaluation form may be obtained from the Admissions Office, the International Programs Office, or at: http://www.wes.org. The form must be submitted with 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 adviser reference form is required.

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 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. 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 adviser in their major to determine course applicability.

A credit summary, indicating only the number of credits transferred, institution of origin, and the student’s transfer GPA, 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 adviser. 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, excluding withdrawals, at a regionally accredited institution of higher education will be posted in transfer by UND. There are certain exceptions to this rule, and those exceptions include, but may not be limited to, the following:

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

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

Students transferring college credit from all institutions outside 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: 1. Transfer students should request an Application for Admission from the Enrollment Services Office, Box 8135, University of North Dakota, Grand Forks, ND 58202, or on the web at: go.und.edu.
2. Students must complete the application and return it to the Office of Admissions together with a $35 non-refundable fee.

3. Students must request that an official transcript from each college attended be forwarded directly to the Office of Admissions, 264 Centennial Drive, Stop 8357, University of North Dakota, Grand Forks, ND 58202. 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. These are required even though no credit may have been earned at an institution. An official high school transcript mailed to the Office of Admissions directly from the high school is required for all students who have earned fewer than 60 semester credits accepted toward a baccalaureate degree and official ACT or SAT results are required for students allowed less than 24 semester credits in transfer to a degree program.

When to Apply: A transfer applicant may submit an application as soon as he or she has registered for the last term which he or she intends to complete at his or her former school. Students from other colleges who are accepted to transfer to the University will receive information about early registration during which time they may come to the University for advice about their schedule and may enroll for the first semester courses.

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

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. New students will be informed of the dates, times and specific details.
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 general education program. Since institutional policies may change between catalog publication dates, students are encouraged to consult with their academic adviser whenever appropriate. Students with questions also should request information from their academic department, the dean’s office of their college, and the various administrative offices on campus.

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

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

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

University, college and departmental requirements. Undergraduate students must meet three sets of requirements to graduate from the University of North Dakota: (1) University graduation requirements, (2) requirements of the UND college or school granting the student’s degree, and (3) the requirements of the student’s major department or program area.

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

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

Advisement Philosophy Statement. Academic Advising is an integral component of undergraduate education at the University of North Dakota. The focus of all academic advising is to assist students in taking responsibility for developing meaningful educational plans which are compatible with their potential and with their career and life goals. It is a decision-making process by both student and academic adviser. The sharing of information occurs in a caring and comfortable environment which promotes responsible and appropriate academic choices. Through a quality advising process, academic advisers strive to facilitate a successful academic experience for students. See the UND website at: www.und.edu for more information.

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 for specific listings. Curricula for specific majors will be found in the Courses of Instruction section of this catalog.

See the section about the Graduate School in this catalog 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 General Education

As a Liberal Arts institution, UND believes that the General Education program is the foundation of a student’s degree, regardless of their specific major. While completing their General Education courses, students are encouraged to explore a range of content areas and to develop broad learning abilities. Students’ general education courses should anchor their future university work and provide a model for lifelong learning. Students are encouraged to consult with their academic advisor when choosing general education courses and to venture into areas that are new to them. 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 General Education Program is the responsibility of the General Education Requirements (GER) Committee, a committee of the University Senate comprising student, faculty, and administrative representatives from across campus. UND’s full philosophy of General Education, the specific requirements of the program as well as the current and archival lists of courses that satisfy the requirements can be found at the GER committee website, http://www.und.edu/dept/registrar/GERcommittee/gerindex.htm.

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 and MnSCU institutions. Students who have completed their general education requirements at another North Dakota or MnSCU institution recognized by GERTA should request proof of this completion be sent to the UND Office of the Registrar. Stu-
undergraduate Academic Information

students who have completed an Associates of Arts degree or who have completed their general education requirements at another North Dakota University System (NDUS) or MnSCU institution will be deemed to have completed the general education requirements at UND.

UND coursework generally acceptable at other NDUS schools as general education courses are designated on the list of approved general education courses at: www.und.edu/dept/registrar/GERcommittee/gerindex.htm . Please direct questions about the NDUS or MnSCU Transfer Agreement to the UND Registrar’s Office or the Registrar at another NDUS institution.

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 pages 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. General Education Program Requirements

An overview of the philosophy guiding the General Education portion of the University’s graduation requirements is provided in the immediately preceding section of the catalog. The complete philosophy statement, the specific goals of the General Education program and the courses that can be used to satisfy the General Education graduation requirements can be found at: www.und.edu/dept/registrar/GERcommittee/gerindex.htm .

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 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.

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. 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.

V. Double Use of Courses

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

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 specific information.

VI. Grade Point Average

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 work taken at the University of North Dakota be 2.00 (C).

Some undergraduate colleges require higher averages. (See requirements under specific college information.)

VII. 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.

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 must make written application to the Registrar or to the dean of the college of the degree within the first four weeks of the semester in which the student expects to receive the degree. Blank application forms may be obtained from the Registrar. Students applying for two or more degrees to be awarded simultaneously must receive approval from each college granting the degrees.

Conferring of Additional Baccalaureate Degrees. Students who have majors falling under different degrees may be eligible for a second degree. Candidates for a second UND baccalaureate degree must complete a minimum of 155 hours (30 additional hours beyond the University minimum of 125 hours 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.

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. When students transfer from one NDUS institution to another, the CCN transfer courses will fulfill all the same requirements as would the CCN course at the new school (*transfer CCN courses will not fulfill the last 30 hours in residence requirements nor will 100-level and 200-level courses fulfill upper division requirements.) A list of the common courses can be found on the North Dakota University System website at: www.ndus.nodak.edu.
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 which correspond to work taken at unaccredited and non-degree granting institutions, or for courses in which they have superior preparation or knowledge gained through 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 are listed below with minimum acceptable standard score. 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 previously failed.

5. A Subject Examination may not be used to establish credit in a subject which the student has previously failed.

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 Administration Procedures Committee, since the last 30 credits must be earned in residence at the University, and CLEP credit is considered as equivalent to credit earned at another institution. All CLEP testing is now computer based. UND uses the ACE Recommended Credit-Granting Score as a guide to determine whether credit is granted.

<table>
<thead>
<tr>
<th>SUBJECT EXAMINATION</th>
<th>MINIMUM STANDARD SCORE</th>
<th>EQUIVALENT UND COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology (General)</td>
<td>50</td>
<td>Chem 121, 121L (4 cr.)</td>
</tr>
<tr>
<td>Business Law (Introductory)</td>
<td>50</td>
<td>Acct 315 (3 cr.)</td>
</tr>
<tr>
<td>Calculus with Elementary Functions</td>
<td>50</td>
<td>Math 146 (3 cr.)</td>
</tr>
<tr>
<td>Chemistry (General)</td>
<td>50</td>
<td>Chem 121, 121L (4 cr.)</td>
</tr>
<tr>
<td>College Algebra</td>
<td>50</td>
<td>Math 103 (3 cr.)</td>
</tr>
<tr>
<td>Composition, Freshman</td>
<td>50</td>
<td>English 110 (3 cr.)</td>
</tr>
<tr>
<td>Educational Psychology (Intro. to)</td>
<td>50</td>
<td>Psych 213 (3 cr.)</td>
</tr>
<tr>
<td>History of U.S. I</td>
<td>50</td>
<td>Hist 103 (3 cr.)</td>
</tr>
<tr>
<td>History of U.S. II</td>
<td>50</td>
<td>Hist 104 (3 cr.)</td>
</tr>
<tr>
<td>Human Growth and Development</td>
<td>50</td>
<td>Psych 250 (4 cr.)</td>
</tr>
<tr>
<td>Psychology (Introductory)</td>
<td>50</td>
<td>Psych 111 (3 cr.)</td>
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<tr>
<td>Languages (French, German, Spanish)</td>
<td>50</td>
<td>Fren, Germ, Span 101 (4 cr.)</td>
</tr>
<tr>
<td>Macroeconomics (Principles of)</td>
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<td>Econ 202 (3 cr.)</td>
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<tr>
<td>Microeconomics (Principles of)</td>
<td>50</td>
<td>Econ 201 (3 cr.)</td>
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<td>Sociology (Introductory)</td>
<td>50</td>
<td>Soc 110 (3 cr.)</td>
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<tr>
<td>Trigonometry</td>
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<td>Math 105 (2 cr.)</td>
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<tr>
<td>Western Civilization I</td>
<td>50</td>
<td>Hist 101 (3 cr.)</td>
</tr>
<tr>
<td>Western Civilization II</td>
<td>50</td>
<td>Hist 102 (3 cr.)</td>
</tr>
</tbody>
</table>

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. Students may receive advanced standing and from 4 to 16 credits in each language (12 in Latin). 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 enrolled in a language who wish to take the Foreign Language Placement & Credit Test must take it during the first two weeks of the semester.

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 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. Students enrolled in Cooperative Education 397, irrespective of the number of actual credit hours, are granted full time equivalent student status by the University.

The Cooperative Education Program, a part of Career Services, is located in McCannel Hall, Room 204. 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 Schedule of Courses, which is available at: www.und.edu/dept/registrar. Students must be registered to attend a class.

CHANGE OF REGISTRATION

After a student has registered, he or she should consult with his or her adviser 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 without a grade for all students is on the Friday five weeks preceding the last class day of each term. (See also Summer Sessions deadlines on the academic year catalog.) 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 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 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 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 Schedule of Courses each semester.

INSTRUCTOR'S DROP POLICY

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

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

WITHDRAWAL FROM UNIVERSITY

A student wishing to withdraw from the University before the end of a semester must complete a Withdrawal Form in the Office of the Registrar where personnel will direct the student through the withdrawal process.

The last day a student may cancel registration without grades is the Friday five weeks preceding the last class day of the term. (See also Summer Sessions deadlines). After that time a student 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 exami-
nated. The course must be repeated to earn credit. Audited courses may not count toward class load for financial aid or other purposes.

Incomplete Grades

It is expected that students will complete all requirements for a course during the time frame of the course. For reasons beyond a student’s control, and upon request by the student or on behalf of the student, an incomplete grade may be assigned by the instructor when there is reasonable certainty the student will successfully complete the course without retaking it. The mark “I,” Incomplete, will be assigned only to the student who has been in attendance and has done satisfactory work up to a time within four weeks of the close of the semester, including the examination period, and whose work is incomplete for reasons satisfactory to his or her instructor.

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

An “I” may be converted as indicated above but cannot be expunged from the record. Students may not register in courses in which they currently hold grades of incomplete, except for courses that allow repeated enrollment. A student will not be allowed to complete for reasons satisfactory to his or her instructor.

Required S-U Courses

Students who utilize the S-U grading system are cautioned that results in a U, will leave 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 by the Office of the Registrar to a grade of U. Changes in registration to or from S-U grading may, with the approval of the adviser, 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.

REPEITION 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.

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.

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.

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 depart-
ment and dean of the course and the student’s adviser, except in the School of Law, the School of Medicine and Health Sciences, and the College of Nursing. 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 adviser, 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 advisers to be used for advise-ment 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 at: www.und.nodak/dept/registrar. 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 on-line 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 until the indebtedness has been paid.

UNIVERSITY ATTENDANCE POLICY

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.

Even in situations where an instructor might excuse a class absence, e.g., severe medical situations, family emergencies, 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.

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 incomplete 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 DISMISAL POLICY

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 Academic Good 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 Academic Good 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. 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. NOTE: It is possible to be in Academic Good Standing at the University, and, yet not to be in Academic Good Standing in certain University programs which require a GPA higher than 2.00.

Suspended students 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. Deans may specify enrollment stipulations at the time of reinstatement. The student will return to UND on probationary status. Under extenuating circumstances suspended students may seek immediate reinstatement from their dean without leaving the University for one academic semester. If the Dean does not reinstate the student after suspension, the student may appeal to the University Senate Student Academic Standards Committee.

After the second suspension, failure to achieve minimum academic standards will result in the student being dismissed from the University with no further opportunity to enroll at the undergraduate level. Students may appeal dismissal to the University Senate Student Academic Standards Committee.

Suspension and dismissal are permanently recorded on the student’s transcript.

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.

It is taken for granted when a student enters the University that he/she has an earnest purpose. This presumption in the student’s favor continues until, by neglect of duty or by inappropriate behavior, he/she brings his/her status into question. Cases involving student violations of academic or non-academic regulations may be judged by student conduct committees, the Student Relations Committee, or by the Dean of Students and Housing Offices. Adjudication will incorporate both substantive due process, i.e., fair and equitable treatment, and appropriate procedural due process.

The Code of Student Life is available at: http://sos.und.edu/csl or from the Vice President for Student and Outreach Services Office or the Dean of Students Office. 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. Section 3 in the Code covers academic concerns (grievances and standards) and section 2 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 of Student and Outreach Services, 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.

A. Cheating on a test includes, but is not restricted to:
   1. Copying from another student’s test.
   2. Possessing or using material during a test not authorized by the person giving the test.
   3. Collaborating with or seeking aid from another student during a test without authority.
   4. Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or in part the contents of an unadministered test.
   5. Substituting for another student or permitting another student to substitute for oneself to take a test.
   6. Bribery another person to obtain an unadministered test or information about an unadministered test.

B. 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.

C. Collusion means the unauthorized collaboration with another person in preparing written work offered for credit.

For detailed policy statements and procedures dealing with scholastic dishonesty, see the Code of Student Life, section 3.

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. 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.

- Cum laude: 3.5
- Magna cum laude: 3.7
- Summa cum laude: 3.9

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.

* This policy will go into effect for the December, 2008 commencement. Until then, General Honors will be awarded with the 3.20/3.50/3.70 GPA’s, but using only the UND GPA and the 50 graded hour requirement.
The John D. Odegard  
SCHOOL OF AEROSPACE SCIENCES  
Bruce A. Smith, Dean

MISSION AND HISTORY

The principal mission of the School of Aerospace Sciences is to preserve, create, and disseminate knowledge and to demonstrate the principled use of knowledge for and about aerospace, atmospheric sciences, space studies, earth system science and policy, and computer science. In consort with other units of the University of North Dakota, it is committed to providing a comprehensive, high quality, relevant education for students preparing for careers in these fields.

Always at the forefront of technology, the School has earned national acclaim for its achievements in collegiate aviation education and atmospheric research. In just a few years, the School has received a steady stream of multi-million dollar research contracts and attracted students from every state and at least a dozen 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 degrees in aerospace fields including flight, air traffic control, aviation business and management, and aviation education, as well as a master’s degree in aviation. With its roots in research, the Department of Atmospheric Sciences undergraduate and graduate programs offer students unique opportunities to participate in funded research and operational forecasting enterprises, including atmospheric chemistry, surface transportation meteorology, and climate analysis, to name a few. The graduate program within the Department of Space Studies offers an interdisciplinary approach to space exploration, research, and development. 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 Center in 1982 offering undergraduate majors and a master’s degree. The newest academic department of the college, Earth System Science and Policy, provides an integrated and creative learning environment, fostering intellectual growth and practical engagement in research and management of the earth system and resources. Two masters degrees and one doctoral program are offered through the department.

To facilitate its unique mix of activities, the School has formed five major support organizations. The Scientific Computing Center supports the high performance computing needs of the college for research, academic, and administrative functions, operating a variety of mainframe and mini-computers. The college’s Regional Weather Information Center houses a world class forecasting and weather analysis center for agricultural, aviation, transportation, education, research, and broadcast use. It utilizes a 24-hours-a-day vanguard approach to data gathering, storage, and analysis. 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 120 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, weather forecasting facilities with satellite downlink, sophisticated computing labs, and the Arthur C. Anderson Atmosphereum — a computerized planetarium and multi-media 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 a modern flight training facility with a fleet of more than 120 aircraft, including reciprocating and turbine powered airplanes and helicopters. A Canadair Regional Jet (CRJ) AS- CENT® 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 90-foot FAA Air Traffic Control Tower and an FAA Automated Flight Service Station are located within a short walking distance. 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.

ADMISSION

Students who are admitted to the University of North Dakota by the Office of Admissions are not necessarily accepted into the professional degree programs in aviation. Students must be admitted to the John D. Odegard School of Aerospace Sciences by completing a Change of Major form at the Student Services office located at Odegard Hall, room 259.

Aviation: A student pursuing a degree program in aviation will first be admitted to the program as a Pre-Commercial Aviation, Pre-Air Traffic Control, Pre-Aviation Systems Management, or a Pre-Flight Education student. In order to be fully admitted to a program leading to the Bachelor of Science in Aeronautics degree with a major
in Air Traffic Control, Aviation Systems Management, Commercial Aviation, or Flight Education, a student must have:

1. Earned at least a 2.50 institutional GPA and overall GPA in all courses taken.
2. Completed a minimum of 24 credits.
3. Completed all required aviation courses with no grade lower than that of “C.”

**Business**: A student pursuing a degree program in business must be admitted to the College of Business and Public Administration as a Pre-Aviation Management or a Pre-Airport Management student. In order to be admitted to a program leading to the Bachelor of Business Administration degree with a major in Aviation Management or Airport Management, 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 six Pre-Business Core courses (Acct 200 & 201; ISYS 117 & 317; Econ 201, 202 & 210) with no grade lower than “C.”
4. Completed all required aviation courses with no grade lower than “C.”

Further information can be obtained by contacting the Office of Academic Advisement located at Gamble Hall, room 127.

**Transfer Credits**. Undergraduate aviation programs, accredited through the Aviation Accreditation Board International, normally concentrate on general education 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, including a strong emphasis in mathematics and physics, 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 general education coursework. Students who already have received FAA pilot certification, but who have not received college credit will be required to retake the applicable aviation courses at UND in order to receive academic credit for graduation. If certain aviation courses are waived, the aviation credits are not waived, and a student must consult with his/her academic advisor as to the appropriate substitute aviation courses. Students who take aviation courses and receive credit at another academic institution may also be required to validate their aeronautical knowledge and skill before transfer credit will be granted. Questions regarding transfer credit should be directed to the Student Services office located at Odegard Hall, room 259.

**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 and Doctor of Philosophy in Atmospheric Sciences. These degrees are conferred upon a student who successfully fulfills the graduation requirements. A student must:

1. Complete the University’s General Education 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. 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 **Department of Aviation**, through the John D. Odegard School of Aerospace Sciences, offers the degree of Bachelor of Science in Aeronautics. This degree is conferred upon a student who successfully fulfills the graduation requirements. A student must:

1. Complete the University’s General Education 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. 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 **Department of Computer Science**, through the John D. Odegard School of Aerospace Sciences, offers the degrees of Bachelor of Science, Bachelor of Arts, and Master of Science in Computer Science. These degrees are conferred upon a student who successfully fulfills the graduation requirements. A student must:

1. Complete the University’s General Education 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 **Department of Space Studies**, through the John D. Odegard School of Aerospace Sciences, offers an undergraduate program leading to a minor in Space Studies. This program introduces students to the variety of space related projects and issues that will affect their careers and lifestyles in the coming decades. At other universities, 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 **Earth System Science and Policy** department offers graduate degrees only. The curriculum is outlined under the specific departmental listings.
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 ten-day summer program to introduce the excitement and challenge of aerospace to 16 and 17 year old prospective aviators.

Laptop Program. In 1998 the Aviation Department instituted a laptop computer program for all aviation majors. The laptop computer enables students to acquire those computer skills highly sought by employers in business and industry while they are becoming proficient in their career field. The Aviation Department provides students an exciting opportunity to advance their technical skills using the laptop computer. It is required for all students to participate in this program.

STUDENT ORGANIZATIONS

Alpha Eta Rho (AHP). The Delta Chapter of Alpha Eta Rho, an international aviation fraternity, stresses closer ties between students and the industry through education. The group annually sponsors Parents’ Day, an opportunity for parents to experience the excitement of aviation education.

American Association of Airport Executives (AAAE). Specifically geared towards students majoring in or interested in a career in airport management, this student chapter of AAAE promotes professional development and instills professional attitudes in students who are studying aviation industry related developments, administration, and operations.

American Meteorological Society. The Lake Agassiz Student 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.

Army Aviation Association of America (AAAAA). The UND Chapter of the Army Aviation Association of America is open to anyone with an interest in U.S. Army aviation. Emphasis is on exploring rotary wing flight and experiencing good fellowship. Each member receives the AAAA monthly publication “Army Aviation” magazine which keeps members abreast of the latest advances in Army aviation.

Association for Computing Machinery Computer Club. As the student branch of the National Association for Computing Machinery, this organization sponsors such events as computer programming contests, computer demonstrations, tutorial programs, and opportunities to visit and tour companies within the industry.

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.

Aviation Photographers and Enthusiasts (APE). The Aviation Photographers and Enthusiasts is a place to discuss the world of aviation. We discuss and participate in the commercial aviation industry. One way of doing this is through photographing airliners in Grand Forks and beyond. Our organization aims at increasing the aviation knowledge of our members, UND students and the community.

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, fly-ins, 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 Pilot’s Association. The purpose of this student group is to help 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.

Skies Astronomical Society. The Northern Skies Astronomical Society is an amateur astronomy club established for UND students, but open to the public. The club enjoys making astronomy observations and educating others about astronomy. Equipment and extensive knowledge of astronomy are not required.

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 six-member 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.

Student Aviation Technology Board (SATB). SATB was created to assist the School of Aerospace Sciences in remaining on the cutting edge of technology use in an educational environment. The Board addresses student needs and concerns, but also generates new ideas for increased utilization of technological developments that would be beneficial to students.

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.
Upsilon Pi Epsilon Honor Society. The student group is the National Computer Science honorary organization. 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
Martha A. Potvin, Dean

HISTORY AND ORGANIZATION

The College of Arts and Sciences dates from the founding of the University in 1883, and has had organic continuity from that date, in spite of some temporary changes in name and structure. The “Act for Establishing a Territorial University at Grand Forks” provided for a College of Arts “co-existent with” a College of Letters. In 1901 the name “College of Liberal Arts” was adopted, and retained until 1943, when “College of Science, Literature and Arts” was substituted. The latter name was kept until 1967. The President of the University served in effect as dean of the College until 1901, to be followed by George S. Thomas (1901-1911), Melvin A. Brannon (1911-1914), Vernon P. Squires (1914-1930), William G. Bek (1930-1948), Robert Bonner Witmer (1948-1965), and interim associate dean Philip A. Roglie (1965-66). Bernard O’Kelly was dean from 1966 until his retirement in 1995 when he was succeeded by John Etting (1995-1998). Albert Fivizzani served as interim dean of the College from 1998 until 2001 when Martha A. Potvin became dean. Bruce Dearden served as interim dean for 2004 to 2005.

The College includes 19 academic departments: Anthropology, Art, Biology, Chemistry, Communication, Communication Sciences and Disorders, Criminal Justice, English Language and Literature, Geography, History, Indian Studies, Mathematics, Modern and Classical Languages, Music, Philosophy and Religion, Physics, Psychology, Sociology, and Theatre Arts. The coordinator of the Honors Program, the coordinator and faculty of the Humanities and Integrated Studies Program and the director of the Interdisciplinary Studies Program are also members of the College’s faculty. The faculty of departments structurally located in other colleges — Computer Science, Economics, Geology, and Political Science — are regularly consulted on an associate faculty basis, since the disciplines of those departments are historically associated with the liberal arts. Many of the liberal arts faculty are involved in various ways in the work of the College of Education and Human Development.

The College enrolls all undergraduates who wish to complete studies for the Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music or Bachelor of Science degree with concentration in some substantive or applicative field of study within the traditionally broad spectrum of the liberal arts.

MISSION

By its nature and in accordance with its history, the College of Arts and Sciences concerns itself principally with higher education in the broadest or liberal sense. The Bachelor of Arts, Bachelor of Science, Bachelor of Fine Arts and Bachelor of Music are therefore the principal first degrees offered by the College; through subsequent enrollment in the Graduate School, students pursue master’s or doctoral degrees in the liberal arts fields. Many undergraduates in the College are preparing themselves for specific professions — e.g., conservation, writing and editing, scientific research, the performing arts, secondary-school teaching, programming, translation, speech therapy, the justice system and government service. However, the College’s overall goal for all students is intellectual growth through study in the liberal arts: the natural sciences and mathematics, the humanities, the social sciences, and the fine arts. These fields of study concern themselves first with the nature of humanity and of the universe, rather than with specific vocational applications.

The College of Arts and Sciences therefore pursues these goals:

1. To provide programs leading to the B.S. or B.A. in liberal arts disciplines and the B.Mus. or B.F.A. in the Fine Arts;
2. To offer programs leading to career-ready baccalaureates in certain fields which have developed from liberal arts disciplines;
3. To offer, through most of its departments, programs leading to master’s degrees and doctorates;
4. To support scholarly and creative activity in the arts and sciences, so that both undergraduate and graduate students can be exposed to, and take an active part in, the creative and scholarly processes and the advancement of knowledge;
5. To foster in students those abilities which contribute to all learning — skills of communication; habits of independent thought, analysis and judgment; and powers of imagination and creativity;
6. To create an environment in the College, and throughout the University, which fosters the study and understanding of diverse cultures and international communities;
7. To provide the opportunity for all students at the University to take courses in liberal arts disciplines.

Students in the College of Arts and Sciences are prepared on graduation for a wide variety of careers, or to continue their studies in graduate schools, as well as medical or law schools and other professional programs. Whether or not they pursue further study, their liberal education as undergraduates will have helped them become flexible life-long learners, and thus have prepared them for a future characterized by rapid change.
ADMISSION TO THE COLLEGE

Freshman students who have decided on a major in Arts and Sciences may be admitted directly to the College. Students enrolled in other colleges at UND who decide on an Arts and Sciences major may transfer to Arts and Sciences provided they are in Academic Good Standing. Transfer students with a satisfactory academic record (generally a C or 2.00 Grade Point Average) may be admitted directly to the College. Please note that some programs, e.g., Communication, Communication Sciences and Disorders, and Criminal Justice Studies, 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, 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 requirements in other departments. In the Major (or concentration) students must have a grade point average of at least 2.20 by graduation.

Majors Available in the College

<table>
<thead>
<tr>
<th>Anthropology</th>
<th>Art</th>
<th>Biology</th>
<th>Chemistry</th>
<th>Classical Studies</th>
<th>Communication</th>
<th>Communication Sciences and Disorders</th>
<th>Computer Science</th>
<th>Criminal Justice</th>
<th>Economics</th>
<th>English</th>
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<tr>
<td>Fisheries and Wildlife Biology</td>
<td>Forensic Science</td>
<td>French</td>
<td>General Studies</td>
<td>Geography</td>
<td>Geology</td>
<td>German</td>
<td>Political Science</td>
<td>Psychology</td>
<td>Religion</td>
<td>Social Science</td>
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MULTIdisciplinary AND INTERdisciplinary Studies

Students with interests in Peace Studies, Russian Studies, Scandinavian 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. 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 C or better in all Education coursework, and a 2.50 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.

Medical School Preparation. Like law schools, medical schools generally require a baccalaureate degree. No particular major is preferred, but a broad, liberal education is expected. In addition, the candidate should fit into his or her program the following courses: Biology 150-151, Chemistry 121-122, Chemistry 341-342, and Physics 211-212. Biochemistry 301 is now strongly recommended by most medical schools and required by some. Math, English and Social/Behavioral Science requirements vary somewhat, but students should have the following at the very least: Math 103 and 146 (or 165 or Psychology 241); English 110 and 120 (or 125); Psychology 111 or Sociology 110. Other selected courses in the Biological Sciences are helpful. Because tomorrow’s physician not only must be accomplished in medicine, but also concerned with the social problems of people, he/she needs to have a broad-based education encompassing in some depth the natural sciences, the social and behavioral sciences, and the arts and the humanities. The student must therefore select a curriculum with these goals in mind. See also the School of Medicine listing.

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., D.A. or Ed.D. 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-PROFESSIONAL PROGRAMS**

Students in pre-professional programs normally enroll in the College of Arts and Sciences. Following are recommended curricula for the various pre-professional programs. See also UND’s Pre-Health website at http://www.und.edu/dept/hpadvize/. Students should plan to meet with the Health Sciences advisor in the dean’s office in the College of Arts and Sciences sometime during their freshman year.

**Pre-Dental**

Most dental schools require a minimum of three years of college, however, the majority of admitted students have completed an undergraduate degree. All schools require successful completion of at least one year each of biology, physics, general chemistry, and organic chemistry. Some schools require additional specific courses. For information on dental schools and their requirements consult with the health sciences advisor in the Dean’s Office in the College of Arts and Sciences and the web site above.

**Freshman Year**

Biol 150, 150L, 151, 151L .........................................................................................(8)
Chem 121, 121L, 122, 122L .........................................................................................(8)
Math 103, 146 ..............................................................................................................(6)
*Electives from Group 1 .............................................................................................(10)

**Sophomore Year**

Chem 341, 341L, 342, 342L .........................................................................................(10)
*Electives from Group 2 ............................................................................................(22)

**Junior Year**

Physics 211, 211L, 212, 212L .......................................................................................(8)
*Electives from Groups 2 or 3 ....................................................................................(22)

**Senior Year**

*Electives from Groups 2 or 3 ......................................................................................(32)

*Electives Group 1: Engl 110, 120 or 125; Psych 111; Comm 110; Foreign Language 101 and 102 (if required by major)
*Electives Group 2: Art (120, 130, 151, 200, 204 or 220); Cell Biology (Bio 341); Genetics (Bio 315); Anatomy 204; Physiology 301; Microbiology 302; Accounting; Anthropology; Business; Economics; English Literature; History; Political Science; Psychology; Statistics 241; Sociology
*Electives Group 3: Histology (Bio 369); Biochemistry 301; Histology 310; Analytical Chemistry

**Pre-Medical**

Most medical schools require the completion of an undergraduate degree. All schools require successful completion of basic science, social/behavioral sciences, math and English courses. Some schools require or strongly recommend additional specific courses. For information on specific medical schools and their requirements, consult with the Health Sciences Advisor in the Dean’s Office of the College of Arts and Sciences and the web site above.

**Freshman Year**

Biol 150, 150L, 151, 151L .........................................................................................(8)
Chem 121, 121L, 122, 122L .........................................................................................(8)
Math 103, 146 or 165/166 ............................................................................................(6-8)
*Electives from Group 1 ............................................................................................(8-10)

**Sophomore Year**

Chem 341, 341L, 342, 342L .........................................................................................(10)
*Electives from Group 2 ............................................................................................(22)

**Junior Year**

Physics 211, 211L, 212, 212L .......................................................................................(8)
Biochemistry 301 ........................................................................................................(3)
*Electives from Groups 2 or 3 ....................................................................................(19)

**Senior Year**

*Electives from Groups 2, 3 or 4 ..................................................................................(32)

*Electives Group 1: Engl 110, 120 or 125; Psych 111; Comm 110; Foreign Language 101 and 102 (if required by major)
*Electives Group 2: Cell Biology (Bio 341); Genetics (Bio 315); Anatomy 204; Physiology 301; Microbiology 302; Accounting; Anthropology; Business; Economics; English Literature; History; Political Science; Sociology
*Electives Group 3: Biochemistry 301, Analytical Chemistry
*Electives Group 4: Histology (Bio 369); Neuroscience (Bio 420)

**Pre-Mortuary Science**

The following program is designed to meet the two-year requirement in pre-mortuary science. Ordinarily this program would be followed by one year in a school of mortuary science and one year of apprenticeship. The apprenticeship could come before or after the year of mortuary science study, depending on state requirements, such as those approved by the North Dakota Board of Embalmers. See also the web site above.

**Freshman Year**

Biol 150, 150L, 151, 151L .........................................................................................(8)
Chem 121, 121L, 122, 122L .........................................................................................(8)
Math 103 ....................................................................................................................(4)
Psych 241 ..................................................................................................................(4)
*Pre-Mort Requirements ............................................................................................(6)

**Sophomore Year**

Anat 204, 204L ............................................................................................................(5)
Phys 301, 301L ............................................................................................................(4)
*Pre-Mort Requirements ............................................................................................(21)

**Junior Year/Senior Year**

Transfer to University of Minnesota

*Pre-Mort Requirements: Art (any 100 level); Acct 200; Engl 110 and 120; Comm 110; Comp Sci 101; History (any 100 level); Med 205; Nutr 240; Psych 111; Soc 110.

Please note: Students planning to transfer to the University of Minnesota Mortuary Science Program will need to take two semesters of a foreign language if they did not take one in high school.

**Pre-Optometry**

Most optometry schools require a minimum of three years of college, however, the majority of admitted students have completed an undergraduate degree. All optometry schools require successful completion of at least one year of biology, physics, and chemistry; and all require at least one course in calculus. Additional specific courses are required by each school. Consult with the health sciences advisor in the office of the Dean of the College of Arts and Sciences for schools and requirements and the web site above.

**Freshman Year**

Biol 150, 150L, 151, 151L .........................................................................................(8)
Chem 121, 121L, 122, 122L .........................................................................................(8)
Math 103, 146 or 165/166 ............................................................................................(6)
*Electives from Group 1 ............................................................................................(10)

**Sophomore Year**

Chem 341, 341L, 342, 342L or Chem 240/240L ..................................................................(5-10)
Psych 241 ..................................................................................................................(4)
*Electives from Group 2 .............................................................................................(18-23)

**Junior Year**

Physics 211, 211L, 212, 212L .......................................................................................(8)
*Electives from Groups 2 or 3 ....................................................................................(22)

**Senior Year**

*Electives from Groups 2, 3 or 4 ..................................................................................(32)

*Electives Group 1: Engl 110, 120 or 125; Psych 111; Comm 110; Foreign Language 101 and 102 (if required by major)
*Electives Group 2: Cell Biology (Bio 341); Genetics (Bio 315); Anatomy 204; Physiology 301; Microbiology 302; Accounting; Anthropology; Business; Economics; English Literature; History; Political Science; Sociology
*Electives Group 3: Biochemistry 301, Analytical Chemistry
*Electives Group 4: Histology (Bio 369); Neurosciences (Bio 420)

Please note: Students may substitute Chem 240 for the Chem 341/342 sequence for some optometry schools. All optometry schools require some level of calculus—some require 1 semester (for those, Math 146 is sufficient), others require a full year (so Math 165, 166 is needed).
Pre-Veterinary Medicine

Most veterinary schools prefer or require the completion of an undergraduate degree. Although most require no specific major, the vast majority of students entering veterinary school complete degrees in Biology, Zoology or Agriculture. 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. For information on specific veterinary schools and their requirements, consult with the Health Sciences Adviser in the Dean’s Office of the College of Arts and Sciences and the web site above.

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>Biol 150, 150L, 151, 151L</td>
<td>(8)</td>
</tr>
<tr>
<td>Chem 121, 121L, 122, 122L</td>
<td>(8)</td>
</tr>
<tr>
<td>Math 103, 146 or 165/166</td>
<td>(6-8)</td>
</tr>
<tr>
<td>*Electives from Group 1</td>
<td>(8-10)</td>
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</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 341, 341L, 342, 342L</td>
<td>(10)</td>
</tr>
<tr>
<td>*Electives from Group 2</td>
<td>(22)</td>
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**Junior Year**

<table>
<thead>
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<th>Course</th>
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<tr>
<td>Physics 211, 211L, 212, 212L</td>
<td>(8)</td>
</tr>
<tr>
<td>Biochemistry 301</td>
<td>(3)</td>
</tr>
<tr>
<td>*Electives from Groups 2 or 3</td>
<td>(19)</td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Electives from Groups 2, 3 or 4</td>
<td>(32)</td>
</tr>
</tbody>
</table>

*Electives Group 1: Engl 110, 120 or 125; Psych 111; Comm 110; Foreign Language 101 and 102 (if required by major)

*Electives Group 2: Cell Biology (Bio 341); Genetics (Bio 315); Ecology (Bio 332); Evolution (Bio 312); Microbiology 302; Anthropology; Business; Economics; English Literature; History; Political Science; Psychology Statistics (Psych 241); Sociology

*Electives Group 3: Biochemistry 301, Analytical Chemistry; Animal Behavior (Bio 338/338L); Mammalogy (Bio 426); Parasitology (Bio 364/364L); Physiology of Organs and Systems (Bio 442/442L); Vertebrate Zoology (Bio 370, 371)

*Electives Group 4: Histology (Bio 369); Developmental Biology (Bio 378); Ichthyology (Bio 425); Ornithology (Bio 427)

HONORS AND INDEPENDENT STUDY

Students in the College are encouraged to take advantage of the educational opportunities offered by the Four-Year Honors Program and the Senior Departmental Honors Program. In these programs the student bears a greater responsibility for his/her own education than in the more formal programs of the College. Therefore the honor student must develop at once intellectual initiative and intellectual self-discipline; and usually the rewards are correspondingly greater.

Without entering either of the Honors Programs, both of which require better than average academic attainment, students will find within the College many opportunities for independent study and research for which they can receive academic credit. Most departments have “readings” or “special topics” courses in which the student can work with a faculty member in some area not covered by regular courses. Overseas study, especially for Language Majors (several of whom receive scholarships to finance their travel through the Arneberg and Larsen awards each year), is another way in which students can profitably extend the scope of their education. In a variety of circumstances, study or research done off campus can also be offered for academic credit.

Students in the College are also encouraged to plan and to propose to the Dean or to appropriate faculty members interdisciplinary courses which they believe would be educationally sound and interesting. Arts and Sciences 250 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.

SPECIAL FACILITIES AND SERVICES

Two research institutes, the Institute for Ecological Studies, and the Social Science Research Institute, are lodged in the college. In addition, through its various departments, the College of Arts and Sciences provides special services through the Psychological Services Center (Psychology Department) and the Speech, Language, and Hearing Clinic (Department of Communication Sciences and Disorders). In addition, all departments of the College engage in general and specialized research.

The College of Business and Public Administration

**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 had AACSB accreditation since 1990.

**MISSION**

The College of Business and Public Administration is committed to being the preeminent center of learning amongst regional universities, preparing and developing leaders of business, government and society in a global setting. Challenging learning environments provide quality undergraduate and graduate education programs that are interdisciplinary and employ appropriate technological tools. Through the complementary activities of teaching, research, and service, the faculty strives to enhance its position in the scholarly community while fostering the dissemination of a diverse body of knowledge to stakeholders.

Elements of distinction include: Instilling practical knowledge and skills through experiences that integrate theory and practice; encouraging a balanced mix of instructional, applied, and basic research; engaging in innovative teaching, research, and outreach activities that accentuate the complementary and converging aspects of business and government; and nurturing partnerships with a diverse set of entities, both internal and external to the College.
CURRICULA IN THE COLLEGE OF BUSINESS AND PUBLIC ADMINISTRATION

Ten groups of courses are offered in the College of Business and Public Administration, which lead to the degree of Bachelor of Business Administration. They include: Airport Management, Aviation Management, Banking and Financial Economics, Business Economics, Entrepreneurship, Information Systems, Investments, Managerial Finance and Corporate Accounting, and Marketing. Additionally, separate groups of courses lead to the degrees of Bachelor of Science in Public Administration, Bachelor of Accountancy, Bachelor of Science in Graphic Design Technology, Bachelor of Science in Industrial Technology, and Bachelor of Science in Occupational Safety and Environmental Health. 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 International Business and Chinese Studies: Culture and Business (see Business Administration). The College also offers a minor in Information Systems and a certificate in Entrepreneurship (see Entrepreneurship). For both business and non-business students, we offer a track program in Entrepreneurship. Minor programs in Industrial Technology emphasizing Energy and Electronics, Graphic Communication, and Manufacturing 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 degrees in cooperation with the College of Arts and Sciences. They include Economics and Political Science.

The College offers a course which provides an overview of the many areas of focus in business; the Introduction to Business course (BAmd 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 General Education 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.

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.
3. Earned at least a 2.50 overall UND GPA in all courses taken.
4. Completed the six Pre-Business Core courses (Acct 200 & 201; Isys 117; Econ 201, 202 & 210) with no grade lower than that of "C."

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).

Industrial Technology: A student pursuing a degree program in industrial technology is admitted to the College as a major in industrial technology.

Specified Pre-Business Courses. The freshman/sophomore Pre-Business courses, and special Pre-Business course requirements related to certain programs, are set forth below:

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 110</td>
<td>College Composition I</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 120</td>
<td>College Composition II</td>
<td>(3)</td>
</tr>
<tr>
<td>or</td>
<td>Engl 125 Technical &amp; Business Writing</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>Poli 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>
</tr>
<tr>
<td>Psyv 111</td>
<td>Introduction to Psychology</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 202</td>
<td>Principles of Macroeconomics</td>
<td>(3)</td>
</tr>
<tr>
<td>Acct 200</td>
<td>Elements of Accounting I</td>
<td>(3)</td>
</tr>
<tr>
<td>Acct 201</td>
<td>Elements of Accounting II</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 210</td>
<td>Intro to Business and Economic Statistics</td>
<td>(3)</td>
</tr>
<tr>
<td>Lab Science</td>
<td>(see notes)</td>
<td>(4)</td>
</tr>
<tr>
<td>Isys 117</td>
<td>Personal Productivity with Information Technology</td>
<td>(1)</td>
</tr>
<tr>
<td>Arts &amp; Humanities Electives</td>
<td>(3)</td>
<td></td>
</tr>
</tbody>
</table>

Notes

- Students pursuing a degree program in industrial technology must take Ants 110 for laboratory science requirement, take two semesters of a foreign language for arts and humanities requirement.
- Students pursuing a degree in Information Systems must take Psychology 111 instead of Sociology 110 or Anthropology 171.
- Students pursuing a degree program in entrepreneurship must take Psychology 111. In addition, Sociology 110 or Anthropology 171 must be taken in place of the free elective.
- Students wishing to major in Airport Management or Aviation Management must take Atsc 110 for laboratory science requirement, take two semesters of a foreign language for arts and humanities requirement.
- Students wishing to major in Information Systems must take Psychology 111 instead of Sociology 110 or Anthropology 171.
- Students wishing to major in Management must take Psychology 111. In addition, Sociology 110 or Anthropology 171 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.
- All business administration programs offered in the College of Business and Public Administration at the University of North Dakota require students to complete a minimum of 50 percent of the four years’ work in non-business courses. 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
DEGREES AND REQUIREMENTS FOR GRADUATION

The degree of B.B.A., Bachelor of Business Administration; B.S.P.A., Bachelor of Science in Public Administration; B.Acc., Bachelor of Accountancy; B.S.G.D.T, Bachelor of Science in Graphic Design Technology; B.S.I.T., Bachelor of Science in Industrial Technology; or B.S.O.S.E.H., Bachelor of Science in Occupational Safety and Environmental Health, 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 or the Office of Academic Advisement 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 General Graduation Requirements (see General Education 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 in all courses that apply toward the degree. (Transfer students must also earn at least a 2.50 GPA in all work completed at the University of North Dakota that applies toward the degree.)
3. Earn a minimum 2.50 GPA in business administration courses that apply toward the degree and major.
4. Earn a minimum 2.50 GPA in all UND business administration courses that apply toward the degree and major.
5. Complete at least 50% of the semester hours required for the degree in non-business courses.
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. and B.S.G.D.T. 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.O.S.E.H. degree must earn a minimum 2.20 overall GPA and a minimum 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. (Transfer students must also earn at least a 2.50 GPA in all work completed at the University of North Dakota.)
3. Earn a minimum 2.50 GPA in public administration courses required for the major.
4. 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.

Cooperative Education. Cooperative Education opportunities are available to qualified BPA students in the following areas: Accounting, Airport Management, Aviation Management, Economics, Entrepreneurship, Finance, Industrial Technology, Information Systems, Management, Marketing and Public Administration. 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.), the Master of Public Administration (M.P.A.) and Master of science with majors in Industrial Technology and Applied Economics. The Master of Business Administration program is accredited by the AACSBI 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 including six networked microcomputer laboratories that provide students access to the internet and popular spreadsheet, database, and word processing software, as well as a wide variety of other software; and video display equipment for in-class computer aided instruction. 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 in 1998 with a grant from Cargill Inc. primarily for use by students enrolled in the capstone course. Our Lanterman 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 opened January 1, 2004 and 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 any of the three student break-out study/meeting rooms, each 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 completed in 2004. The EideBailly facility includes a computer for each group of four students equipped with dual monitors. The projection equipment and presenter’s station is also included.

College of Business and Public Administration
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 are the two newest additions to Gamble Hall, and 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.

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. Pit style classrooms in Gamble Hall are designed in amphitheater format to facilitate case study instruction. A study room, remodeled in 2002, is available within the building so that students may make profitable use of their time between classes. Two classrooms have been repurposed as interactive video studios and are 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 nonprofit 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. To date, 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.

JOB PLACEMENT

The College enjoys a strong relationship with Career Services in providing job placement services to business students. Students have the opportunity to interview with representatives from business, industry, and government who visit the campus each year for the purpose of hiring graduating seniors and graduate students who are completing advanced degrees. This procedure permits the student to examine and compare companies and positions. Career Services also assists students in preparing for and carrying out job searches through the provision of training in job search techniques, resume/letterwriting and interviewing skills. Business faculty members are available to students for career counseling within their respective fields of expertise. Additionally, the College maintains close contact with employer groups and graduates.

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, National Association of Industrial Technology, American Marketing Association, Distributive Education Clubs of America, Toastmasters, Association for Investment Management and Research, Information Systems Club, Management Club, MBA Student Association, American Indian Business Leaders, Students in Free Enterprise Club, Public Affairs Club, Society of Manufacturing Engineers.

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, Phi Beta Lambda, Pi Sigma Alpha, Pi Omega Pi, and Sigma Iota Epsilon.

University sees as necessary for a complete liberal education. These requirements include a minimum of nine credit hours in communication; twelve hours in mathematics, science and technology; nine hours in social sciences and nine hours in arts and humanities. See General Education Requirements listing for more information. Within each of these broad areas, students may select from a wide variety of courses. Many students who have not decided on a major find that their general education studies point out possible majors for them.

Students who have chosen a major field of study are advised to select courses from among those offered in the general education requirement areas that are especially recommended for the curriculum they expect to follow. Many of these recommendations are found in the departmental and program area listings.
The Division of CONTINUING EDUCATION
Joshua M. Riedy, Dean

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 Continuing Education Association. The Association promotes and upholds standards for extension services by imposing strict procedures for the admission of colleges and universities.

In 1968 the name of the General Extension Division was changed to the Division of Continuing Education. In order to more adequately describe the duties assigned to the Dean of Continuing Education, the title was changed to Dean of Outreach Programs in 1978, but the name of the Division remained unchanged. A restructuring in 1998 resulted in Continuing Education becoming a member of the newly formed Division of Student and Outreach Services.

The mission of the Division of Continuing Education is to promote life-long learning, economic development, and to offer quality educational opportunities, programming, and services by extending the resources of the University. The Division attempts to determine the educational and informational needs of the citizenry of North Dakota that cannot be provided through the regular on-campus programs. Once determined, the goal is to serve those needs whenever 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.

The manner in which “extension” is provided varies according to situation and need. The Division administers the following: credit correspondence and online studies, professional development for educator courses, conferences, workshops, certificate programs, summer events, University within the University, Workforce Development, evening and weekend courses, and off-campus Graduate degree programs at the UND Graduate Center at Bismarck and UND Fargo Outreach Office and to a national and international audience.

CERTIFICATE PROGRAMS, OFFICE OF

Certificate Programs provides distance education for non-academic credit or certification programs. Courses are offered in a wide variety of areas to people seeking career programs 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, by mail, or CD-ROM. Certificate Programs is an Eligible Training Provider for Job Service, ND, SD, MN, and MT. Active duty members of the U.S. Air Force and U.S. Navy are eligible to receive tuition assistance for one certification course during their career.

Review Courses:
- CPA Exam Review Course
- Dietary Managers Exam Review
- GMAT Preparation
- GRE Preparation
- LSAT Preparation
- Math Refresher Course
- SAT/ACT Preparation

Real Estate/Construction Technology:
- AutoCAD 2007
- Home Inspection
- HVAC Technician
- Nebraska Real Estate Pre-licensure Course
- North Dakota Real Estate Pre-licensure Course
- Agency
- Contracts
- Marketplace Ethics and Professionalism
- Risk Reduction

Business Programs:
- Administrative Dental Assistant
- Administrative Professional with Microsoft Office Specialist
- Administrative Medical Specialist with
  - Medical Billing and Coding
- Bookkeeping the Easy Way
- Certified Bookkeeper
- Certified Financial Planner
- Certified Global Business Professional
- Certified National Pharmaceutical Representative
- Conflict Resolution
eBusiness
- Global English
- Human Resources for Healthcare Professionals
- Lean Mastery
- Medical Transcription
- Microsoft Office Specialist
- Payroll Certification
- Project Management
- Records Management
- Six Sigma Blackbelt
- Six Sigma Greenbelt
- Web Database Developer
- Veterinary Assistant
- WebMaster

Healthcare:
- Administrative Dental Assistant
- Administrative Medical Specialist with
  - Medical Billing and Coding
- Advanced Coding for the Physician’s Office
- Advanced Hospital Coding and CCS Preparation
- Certified National Pharmaceutical Representative
- Coding, Reimbursement and Documentation for Physicians
- HIPPA Compliance
- Human Resources for Healthcare Professionals
- ICD-10 Medical Coding
- Legal Nurse Consultant
- Medical Terminology

Additional information can be obtained by calling (701) 777-4269 or toll-free 1-877-450-1841, e-mail to: courses@mail.und.edu, Web: www.conted.und.edu/certificates, or by mail: Certificate Programs, Division of Continuing Education, University of North Dakota, 3264 Campus Rd Stop 9021, Grand Forks, ND 58202-9021.
Medical Transcription
Pharmacy Technician
Records Management

Nutrition:
- Dietary Managers Certification Course
- Diabetes Nutrition Therapy
- Medical Terminology
- Menu Planning
- Nutrition and Aging
- Nutrition and Aging Part II: Alzheimer’s Disease
- Nutrition Assessment
- Nutrition Therapy
- Principles of Nutrition
- ServSafe
- ServSafe Recertification
- Sports Nutrition
- Sports Nutrition Handbook: High School
- Sports Nutrition Handbook: College and Adults

Legal:
- Conflict Resolution
- Forensic Computer Examiner
- HIPAA Compliance
- Legal Nurse Consultant
- Paralegal Certificate
- Principles of Private Investigation

Internet, Design and Technical Programs:
- ASP.NET
- AutoCAD 2007
- Forensic Computer Examiner
- Graphic Design
- Help Desk Analyst
- Web Database Developer
- WebMaster

Microsoft Certification Training:
- Microsoft Certified Database Administrator (MCDBA)
- Microsoft Certified Systems Administrator 2003 (MCSA)
- Microsoft Certified Systems Administrator Plus 2003 (MCSA+)
- Microsoft Certified System Engineer 2003 (MCSE)

Networking Training Programs:
- Cisco® CCNA® Certification Training
- CompTIA A+ Certification Training
- CompTIA Linux+/LPI Level One Certification Training
- CompTIA Network+/Server+ Certification Training
- CompTIA Security+ Certification Training
- Digital Arts Certificate
- Multimedia Design Certificate

Video Game Design:
- 3ds max
- Video Game Design and Development

Credit Courses

Accounting and Business Law
- 200 Elements of Accounting, 3 credits
- 201 Elements of Accounting, 3 credits

Anthropology
- 170 Introduction to Biological Anthropology, 3 credits
- 171 Introduction to Cultural Anthropology, 3 credits
- 340 Medical Anthropology, 3 credits
- 345 Forensic Science, 3 credits

Art
- 110 Introduction to Visual Arts, 3 credits
- 120 Introduction to Drawing and Color Materials, 3 credits

Business Administration
- 101 Introduction to Business, 3 credits
- 395 Grantwriting, 3 credits

Chemical Engineering
- 201 Stoichiometry, 3 credits

Communication
- 110 Fundamentals of Public Speaking, 3 credits
- 200 Introduction to Media Writing, 3 credits
- 201 Visual Communication, 3 credits
- 212 Interpersonal Communication, 3 credits
- 308 Argumentation, 3 credits
- 322 Editing, 3 credits
- 404 Organizational Communication, 3 credits
- 499F Film & TV Narratives as Public Communication, 3 cr.
- 499G Global Development Communication, 3 credits
- 499W Women Communication Across Cultures, 3 credits

Economics
- 105 Elements of Economics, 3 credits
- 201 Principles of Microeconomics, 3 credits
- 202 Principles of Macroeconomics, 3 credits
- 210 Introduction to Business & Economic Statistics, 3 credits
- 303 Money & Banking, 3 credits

Additional information can be obtained by calling (701) 777-2663 or toll-free 1-866-579-2663, by writing: Office of Conference Services, Division of Continuing Education, University of North Dakota, 4300 James Ray Drive, Stop 7131, Grand Forks ND 58202-7131 or by visiting our website at: http://www.conted.und.edu/conferences.

CONFERECE SERVICES, OFFICE OF

The Office of Conference Services assists clients in shaping their conferences and seminars into successful educational opportuni­ties, offering total conference coordination as well as access to the rich resources of the University of North Dakota. Services available include professional program development, financial management, promotion and marketing, registration, on-site coordination, instructional support, program management, evaluation and record keeping.

Additional information can be obtained by calling: (701) 777-2661 or toll-free 1-800-342-8230, by writing: Department of Conference & Online Studies, Division of Continuing Education, University of North Dakota, 3264 Campus Road Stop 9021, Grand Forks, ND 58202-9021 or by visiting our website at: http://www.conted.und.edu.
### English Language and Literature
- 110 College Composition I, 3 credits
- 120 College Composition II, 3 credits
- 125 Technical and Business Writing, 3 credits
- 224 Introduction to Fiction, 2 credits
- 225 Introduction to Film, 2 credits
- 306 Creative Writing, 3 credits
- 316 Shakespeare, 3 credits
- 365 Black American Writers, 3 credits

### Fine Arts
- 150 Introduction to Fine Arts, 3 credits

### Geography
- 134 Introduction to Global Climate, 3 credits
- 151 Human Geography, 3 credits
- 161 World Regional Geography, 3 credits
- 263 Geography of North Dakota, 3 credits
- 362 Geography of Canada, 3 credits

### History
- 101 Western Civilization I, 3 credits
- 102 Western Civilization II, 3 credits
- 103 United States to 1877, 3 credits
- 104 United States since 1877, 3 credits
- 106 Mid. Eastern Civ. from Islam to Present Time, 3 credits
- 269 World War II, 3 credits
- 350 Europe: The Reformation 1500-1648, 3 credits

### Humanities
- 101 Humanities I, 4 credits
- 101L Introduction to Geology Lab, 1 credit
- 111 View of Earth and Planets, 3 credits

### Industrial Technology
- 300 Technology & Society, 3 credits
- 302 Web Page Design, 3 credits

### Information Systems & Business Education
- 444 Philosophy of Vocational Education, 3 credits

### Languages: Modern and Classical
- French (Fren)
  - 101 First Year French I, 4 credits
  - 102 First Year French II, 4 credits
- Spanish (Span)
  - 101 First Year Spanish I, 4 credits
  - 102 First Year Spanish II, 4 credits

### Management
- 305 Managerial Concepts, 3 credits

### Mathematics
- 102 Intermediate Algebra, 3 credits
  (Does not count towards graduation at UND.)
- 103 College Algebra, 3 credits
- 105 Trigonometry, 2 credits
- 107 Pre-Calculus 107, 4 credits
- 146 Applied Calculus I, 3 credits
- 165 Calculus I, 4 credits
- 166 Calculus II, 4 credits
- 208 Discrete Mathematics, 3 credits
- 265 Calculus III, 4 credits
- 266 Elementary Differential Equations, 3 credits

### Music
- 100 Intro. to the Understanding of Music, 3 credits

### Nutrition and Dietetics
- 240 Fundamentals of Nutrition, 3 credits
- 335 World Food Patterns, 3 credits
- 348 Sports Nutrition, 1 credit

### Pharmacology, Physiology, & Therapeutics
- 301 Human Physiology, 4 credits
- 315 Introduction to Pharmacology, 3 credits

### Philosophy
- 101 Introduction to Philosophy, 3 credits

### Physical Education, Exercise Science and Wellness
- 401 Sport Sociology, 3 credits
- 440 Sport Psychology, 3 credits

### Psychology
- 111 Introduction to Psychology, 3 credits
- 241 Introduction to Statistics, 4 credits
- 250 Developmental Psychology, 4 credits
- 270 Abnormal Psychology, 3 credits
- 355 Adulthood and Aging, 3 credits
- 360 Introduction to Personality, 3 credits
- 361 Research in Social Psychology, 3 credits

### Religion
- 203 World Religions, 3 credits
- 345 Death and Dying, 3 credits

### Sociology
- 110 Introduction to Sociology, 3 credits
- 252 Criminology, 3 credits
- 253 Juvenile Delinquency, 3 credits
- 335 The Family, 3 credits

### Teaching & Learning
- 252 Child Development, 3 credits
- 345 Curriculum Develop. & Instruction, 3 credits
- 350 Develop. & Educ. of the Adolescent, 3 credits
- 433 Multicultural Education, 3 credits

All matters pertaining to registration and credit are handled through the Division of Continuing Education.

### Admission

A Correspondence & Online Studies student is initially admitted with non-degree status to the University. Enrollment in courses beyond fifteen semester credits will be contingent upon meeting the entrance requirements for a regular degree seeking student.

Upon completion of a course, a grade is forwarded to the Registrar’s Office. Students who fail to finish or withdraw from their course prior to their completion date will earn a failing grade. Transcripts may be requested from the Registrar’s Office and may be sent to another institution upon written request.

### DEGREES AFTER HOURS

In 2001, the University of North Dakota created Degrees After Hours, a program that allows students to obtain a degree through evening and weekend classes and non-classroom alternatives. Since its inception in 2001, Degrees After Hours has been offering alternatives to traditional education. Students are able to take courses or earn degrees with options that fit their schedule, even if they have a full-time career. Degrees After Hours offers undergraduate, and graduate degrees and courses in Education, Arts and Sciences, Business and Public Administration, Nursing, Engineering, and Aerospace.

Additional information can be obtained by calling (701) 777-2661 or toll-free 1-877-450-1842, by writing: Degrees After Hours, Division of Continuing Education, University of North Dakota, 3264 Campus Road Stop 9021, Grand Forks, ND 58202-9021 or by visiting our website at: www.dah.und.edu.
DISTANCE DEGREE PROGRAMS AND COURSES

Distance Degree Programs coordinates courses and program offerings with the academic colleges and departments with courses scheduled 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 videoconferencing, online, and/or on-site in North Dakota.

Programs include: the Bachelor of Business Administration with a major in Information Systems, the Master of Public Administration and Master of Business Administration from the College of Business and Public Administration; RN to BSN, the Master of Science in Nursing with an Education Specialization from the College of Nursing; the Master of Education in Special Education, Master of Education in Educational Leadership, Master of Science in General Studies in Education, Master of Science in Elementary Education, Master of Science in Early Childhood Education, Master of Education or Master of Science in Instructional Design and Technology, Master of Arts in Counseling, Master of Social Work, Ph.D. of Teaching and Learning: Higher Education, Ph.D. or Ed.D. in Educational Leadership, and coursework leading to an endorsement in Teaching English Language Learners, a graduate certificate program in Autistic Spectrum Disorders from the College of Education and Human Development; a Graduate Certificate in Geographic Information Science and a Master of Arts in Forensic Psychology through the College of Arts and Sciences; and a Bachelor of Science in Chemical, Civil, Electrical or Mechanical Engineering from the School of Engineering and Mines.

Additional information can be obtained by calling: (701) 777-4884 or toll-free 1-877-450-1842, by writing: Distance Degree Programs, Division of Continuing Education, University of North Dakota, 3264 Campus Road Stop 9021, Grand Forks, ND 58202-9021 or by visiting our web site at: http://www.conted.und.edu/ddp.

PROFESSIONAL DEVELOPMENT FOR EDUCATORS

Professional Development for Educators (PDE) provides continuing education opportunities for K-12 professional staff to increase their knowledge and develop new skills. Graduate credit earned through these opportunities, which include courses, workshops, conferences and online studies, can count toward licensing renewal and school district salary lane changes. The appropriate academic departments and colleges approve all PDE continuing education offerings and instructors. These professional development opportunities are not designed for the purpose of being a part of a graduate program, therefore, the graduate credit approved for these opportunities may not be applied toward a graduate degree.

Additional information can be obtained by calling (701) 777-4225, toll free 1-866-261-3677, by writing: Professional Development for Educators, Division of Continuing Education, University of North Dakota, 3264 Campus Road Stop 9021, Grand Forks, ND 58202-9021, or by visiting our web site at: http://www.conted.und.edu/pde/.

SUMMER EVENTS OFFICE

The Summer Events Office coordinates the centralization of non-credit summer event information at UND. The Office gathers non-credit event information from across campus, provides registration services to campus clientele, and works to promote and market summer events to the Greater Grand Forks community and beyond.

Additional information can be obtained by calling: (701) 777-0841, or by writing: Summer Events, Division of Continuing Education, University of North Dakota, Skalicky Tech Incubator, 4300 James Ray Drive Stop 7131, Grand Forks, ND 58202-7131, or by visiting our web site at: http://www.conted.und.edu/summer.

UND OUTREACH OFFICES

UND Bismarck Center

The University of North Dakota offers graduate degree programs through the UND Bismarck Center. The Center has served the Bismarck-Mandan area since 1976. Hundreds of students have taken courses and received degrees through off campus programs.

These programs are designed in flexible formats for working adults who find it necessary to earn a graduate degree during evening and weekend hours. The UND Bismarck Center is located on the Bismarck State College campus and has a long history of providing courses and graduate degree programs to the Bismarck-Mandan area. Programs offered through the UND Bismarck Center include Masters degrees in Business Administration, Public Administration, Educational Leadership, Special Education, General Studies in Education, Early Childhood Education, Elementary Education, Forensic Psychology, Instructional Design and Technology, Nursing with Specialization in Education, Social Work, and Ph.D. in Teaching and Learning with a Higher Education Focus.

The higher education courses are delivered to Bismarck via on-site instruction, the North Dakota Interactive Video Network (ND-IVN), or Online. The ND-IVN system provides students an opportunity to take coursework without leaving their vicinity. ND-IVN allows an expansion of University of North Dakota offerings because faculty members can teach students on campus while reaching those at a distance at the same time. Faculty also may teach from “remote receiving sites” in order to enhance and build positive student-faculty relationships. The students and faculty members can see and interact simultaneously in multiple classroom locations.

For more information please call 701-224-5437 or toll-free 1-800-445-5073 or: undbismark@mail.und.nodak.edu. Or call the UND Division of Continuing Education at 701-777-4884 or toll-free at 1-877-450-1842. We are located at 1309 Schafer Street, PO Box 5587, Bismarck, ND, 58506.

UND Fargo Outreach Office

The purpose of the UND Fargo Outreach Office is to promote lifelong learning, economic development and offer quality educational opportunities, programming and services by extending the resources of the University to the Fargo/Moorhead area. The UND Fargo Outreach Office strives to identify unmet needs and work through the Division of Continuing Education to develop new programming designed to address the needs.

The existing array of educational offerings and services are designed to meet the educational needs not currently being addressed by other providers. The programs are designed in flexible formats for working adults who find it necessary to earn an undergraduate or graduate degree during the evening, weekends, or online.

Programs offered through the UND Fargo Outreach Office include: Graduate degrees in Forensic Psychology, Special Education, Instructional Design and Technology, a Ph.D. in Educational Leadership, a Graduate Certificate in Autistic Spectrum Disorders, and graduate courses leading to Endorsement in Teaching English Language Learners.

Undergraduate degrees offered include: a Bachelor of General Studies (B.G.S.), Bachelor of Arts in Social Science (B.A.), Online Completion Program for a Bachelor of Business Administration degree in Information Systems, RN to Bachelor of Science in Nursing Degree Completion (RN/BSN), and Degree Completion programs for Bachelor Degrees in Electrical, Mechanical, Chemical and Civil Engineering.
The UND Fargo Outreach Office serves as the focal point for the University’s response to the Higher Education Roundtable call for NDUS institutions to become more responsive, flexible, accessible, entrepreneurial, and accountable. It is anticipated that expanded programming in the Fargo/Moorhead market will help UND achieve its strategic mission to serve the entire State of North Dakota.

The UND Fargo Outreach Office is located on the School of Medicine’s Southeast Campus at 1919 N Elm Street, Fargo, ND 58102. UND staff located at the UND Fargo Outreach Office can be reached from an on campus extension at 2-4186 and from off campus at 701-293-4186. The Division of Continuing Education’s web site: http://www.conted.und.edu/index.html, provides information on the variety of undergraduate, graduate, certificate and other outreach programs available to students and businesses in the Fargo/Moorhead region.

UNIVERSITY WITHIN THE UNIVERSITY

The University Within the University is designed to coordinate the planning and delivery of campus professional development and training activities for UND employees through an integrated approach to needs assessment, planning, marketing and program delivery.

Additional information can be obtained by calling (701) 777-2313 or toll-free 1-800-342-8230, by writing: University Within the University, Division of Continuing Education, University of North Dakota, 4300 James Ray Drive Stop 7131, Grand Forks ND 58202-7131 or by visiting our web site at: http://www.conted.und.edu/ Workforce.

WORKFORCE DEVELOPMENT

The Office of Workforce Development is the “gateway” for business and industry, to the talents, expertise and technologies that are available through the University of North Dakota. UND’s Workforce Development professionals work closely with business and industry to diagnose the workforce needs of their organization and, when appropriate, recommend innovative, practical solutions for the recruitment, development, retention and advancement of their employees. In addition, Workforce Development offers strategic services such as: facilitation leaders, strategic planning, business and industry research, human resources consulting, and grant writing.

Additional information can be obtained by calling (701) 777-2313 or toll-free 1-800-342-8230, by writing: Workforce Development, Division of Continuing Education, University of North Dakota, 4300 James Ray Drive Stop 7131, Grand Forks ND 58202-7131 or by visiting our web site at: http://www.conted.und.edu/ Workforce.

The College of

EDUCATION AND HUMAN DEVELOPMENT

Dan Rice, 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 six academic departments: Counseling (which also includes Recreation and Leisure Services and Rehabilitation and Human Services); Educational Foundations and Research; Educational Leadership; Physical Education and Exercise Science; Social Work; and Teaching and Learning. Also affiliated with the College are the Bureau for Educational Services and Applied Research, the University Children’s Center; and bureaus of the Department of Social Work: Child Welfare Research Bureau; and the Children and Family Services Training Center.

MISSION

The College of Education and Human Development has the unique mission within the University of fostering healthy human development and learning across the lifespan, beginning in early childhood. In support of this mission, the College actively embraces human and cultural diversity as an asset and seeks to weave it throughout all of our activities. At both the graduate and undergraduate level, students in EHD develop the skills and self-awareness to become effective professionals and leaders in schools, higher education, human service and wellness organizations. In these roles, graduates of EHD empower individuals, families, groups, organizations, and communities to make healthy decisions and lead full and productive lives. Through these efforts, graduates serve a vital function in recreating and maintaining a healthy economy and enhanced quality of life.

The six 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. We especially seek to develop mutually supportive partnerships with historically under-served populations.

HISTORY

Although the College of Education and Human Development is new, its disciplines have a long history at the University of North Dakota.

The University of North Dakota has offered teacher education programs since its founding in 1883. The preparation of teachers at UND was coordinated by the Normal Department from 1883 to 1900; by the Normal College from 1900 to 1905; by Teachers College from 1905 to 1911; by the School of Education from 1911 to 1953; and by the College of Education until 1972, when programs of that college merged with the New School for Behavioral Studies to form the Center for Teaching and Learning. The present education faculty continue the UND traditions of leadership to the schools, colleges, and communities of North Dakota and the Upper Midwest; of promoting a broader view of education; and of providing teachers, administrators, and other educational personnel with intensive, intellectually challenging, integrated programs of study. 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 Health, Physical Education and Exercise Science 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, and exercise science in many settings.

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 Leisure Services and Rehabilitation and Human Services joined the Counseling department.

The first social work courses were offered at UND by Dr. John Gillette, a member of the Department of Sociology. A social work program was started in 1911. By 1967, when the Department of Social Work was founded, UND students and faculty had invested much effort and creativity in the promotion of social welfare. In 1972, the department moved from the College of Arts and Sciences to the College for Human Resources Development.

**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. Programs in social work are accredited by the Council on Social Work Education. 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.

**Physical Education and Exercise Science**
- B.S. in Physical Education

**Social Work**
- B.S. in Recreation and Leisure Services
- B.S. in Rehabilitation and Human Services
- B.S. in Social Work

**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 a combined major in Elementary Education/Mathematics
- B.S.Ed. with double major in Elementary/Middle Level Education
- B.S.Ed. with major in Middle Level Education
- B.S.Ed. with major in Science Education (secondary)
- B.S.Ed. with major in Social Studies Education (secondary)

Students preparing to teach in the secondary schools may fulfill teacher education requirements by completing the following degree programs and the professional education program in the Department of Teaching and Learning.
- B.A. with major in Communication
- B.A. with major in English
- B.A. with major in French
- B.A. with major in German
- B.A. with major in History
- B.S. with major in Spanish
- B.S. with major in Industrial Technology
- B.S. with major in Biology
- B.S. with major in Chemistry
- B.S. with major in Geology
- B.S. with major in Geography
- B.S. with major in Mathematics
- B.S. with major in Physics

Candidates preparing to teach music, art or physical education in the schools may fulfill requirements to teach grades K through 12 by completing the following degree programs and the professional education program in the Department of Teaching and Learning.
- B.S. in Physical Education
- Bachelor of Music
- B.F.A. with major in Visual Arts

Minors may be taken in a wide variety of fields including athletic coaching, chemical use/abuse awareness, gerontology, health education, recreation and leisure services, rehabilitation services, 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 105 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, Room 105 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 semester 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
- PPST scores – must meet the minimum of 172 Math; 173 Reading; 173 Writing or composite score of 518 with two of three scores passing and a third score not more than 2 points below the cut score
- Quality of letter of application – consider clarity of expression and seriousness about becoming a teacher
- 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 obtain teacher licensure, you will be required to submit to a full background check and FBI fingerprint check. 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 teachers 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 teachers 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 can envision resolution to the dilemmas of teaching which contribute to a democratic, humane, and just society. 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, group learning, and portfolio assessment.

The goals of the basic programs in teacher education are to support the development of teachers who are learners, active agents of learners and articulate visionaries. 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 2.5; 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 candidate’s work and disposition, as well as portfolios assembled by candidates. Candidates are asked to save and file all work completed in courses of their teacher education programs. At several points in each program, candidates review their work with faculty and other candidates. Portfolio assessment offers opportunities to discuss individual growth as a teacher and learner and to assess progress in addressing program themes. Effective use of writing in many situations is essential for completion of teacher education programs and is considered in the portfolio assessment process.

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 which include Early Childhood, Elementary Education and in Middle Level Education complete each course in Teacher Education with a minimum grade of C, satisfactorily complete a field experience, present a minimum overall GPA of 2.75 based on at least 76 hours of work, and are recommended by the faculty in their area(s) of student teaching. 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).

Although student teacher placement is usually made in greater Grand Forks and the surrounding area, more distant placements can often be arranged for candidates whose performance in the program is strong and who are recommended by the faculty. Opportunities are available to teach abroad through the Global Student Teaching program.

The College of Education and Human Development also offers undergraduate majors in the following fields:
• Physical Education and Exercise Science
• Recreational and Leisure Services
• Rehabilitation and Human Services
• Social Work
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 counselors, counseling psychologists, social workers, physical education professionals, teachers, school administrators, and other educational personnel for schools and institutions of higher education.

The Department of Social Work offers a graduate program leading to the Master of Social Work (MSW) degree. The M.S. with a major in Physical Education is offered by the faculty in the Department of Kinesiology, and Exercise Science. The Department of Counseling 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 Leadership offers programs leading to the M.Ed. and M.S., the Educational Specialist (Ed.S.), and the Ed.D. and Ph.D. with a major in Educational Leadership. The Department of Teaching and Learning offers programs leading to the M.S. with majors in Early Childhood Education, and to the M.Ed. and M.S. with majors in Elementary Education, Reading Education, Special Education, Instructional Design and Technology and, with faculty in the Department of Educational Foundations and Research, programs leading to the M.S. in General Studies in Education and to the Ed.D. and Ph.D. with major in Teaching and Learning.

### The School of ENGINEERING AND MINES

**John Watson, 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 School of Engineering and Mines offers programs in Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Environmental Geosciences, Geological Engineering, Geology, and Mechanical Engineering. All programs are housed in a central campus location with lecture rooms and laboratories in Upson I and II, Harrington Hall, and Leonard Hall.

**MISSION**

The primary mission of SEM 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. SEM’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 School 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 on-going 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 School of Engineering and Mines. The mission of the School includes engineering programs being accredited by the Accreditation Board for Engineering and Technology (ABET).

**ACCREDITATION OF ENGINEERING PROGRAMS**

The Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) has accredited the following University of North Dakota curricula: Chemical Engineering, Civil Engineering, Electrical Engineering, Geological Engineering, and Mechanical Engineering. Accreditation identifies professional engineering curricula that provide a solid education upon which to base engineering practice. ABET serves the public through the promotion and advancement of engineering, technology and applied science education.

ABET represents 19 engineering societies, including the American Institute of Chemical Engineers, the American Institute of Mining, Metallurgical & Petroleum Engineers, the American Society of Civil Engineers, the American Society of Mechanical Engineers, the Institute of Electrical and Electronics Engineers, Inc., and the National Society of Professional Engineers.

State Boards of Registration governing the practice of professional engineering allow a student who is completing an ABET-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 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 General Education 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 Geographical Engineering, and Bachelor of Science in Mechanical Engineering. The School of Engineering and Mines also offers a Bachelor of Science in Environmental Geosciences. Bachelor of Science and Bachelor of Arts degrees in Geology are taught in the School, but the degrees are awarded through the College of Arts and Sciences.

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.

**Graduate Study.** Graduate work, offered by departments in the School of Engineering and Mines lead to the degrees of Master of Engineering with majors in chemical engineering, civil engineering,
electrical engineering, environmental engineering and mechanical engineering; Master of Science with majors in chemical engineering, electrical engineering, environmental engineering, geological engineering, geology, and mechanical engineering; and Doctor of Philosophy with majors in engineering and geology. Admission to graduate work in the various departments may be granted to a student upon the recommendation of the Dean of the Graduate School and the chair of the department in which the study will be undertaken. For admission to the Doctor of Philosophy with a major in engineering, the recommendation of the Director of the Engineering Graduate Program Committee is required. Prospective graduate students should familiarize themselves with the material listed in the Graduate School 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
<th>UND Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engr 201 Statics</td>
<td></td>
<td>Chem 121 and 121L</td>
</tr>
<tr>
<td>EE 206 Circuit Analysis</td>
<td></td>
<td>Engl 110 and 125 or 120</td>
</tr>
<tr>
<td>Engr 202 Dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engr 203 Mechanics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 306 Fluid Mechanics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 341 Thermodynamics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Any regularly offered course at the 200 or higher level with the prefix Engr, ChE, CE, EE, GE or ME may be used as an elective.

ADMISSION POLICY

Admission to the University and the School of Engineering and Mines. Students planning to receive a baccalaureate degree in engineering must be enrolled in the School of Engineering and Mines. They will be admitted to the University and to the School 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 School 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.

A student is admitted to a professional engineering degree program through a formal admission process conducted when the student is completing the second year of engineering study and prior to being allowed to take upper division engineering courses. Only students admitted to a professional engineering degree program will be eligible to receive engineering degrees.

Engineering Degree Program Admission Standards. All of the professional engineering degree programs require that the following conditions be met prior to admission:

1. A minimum grade of C must be earned in each of the following foundation courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
<th>UND Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Chemistry</td>
<td>4</td>
<td>Chem 121 and 121L</td>
</tr>
<tr>
<td>English Composition</td>
<td>6</td>
<td>Engl 110 and 125 or 120</td>
</tr>
<tr>
<td>Calculus</td>
<td>12</td>
<td>Math 165 and 166 and 265</td>
</tr>
<tr>
<td>General Physics</td>
<td>8</td>
<td>Phys 251 and 252</td>
</tr>
</tbody>
</table>

An additional science course which may be prescribed by each admitting department.

At least four engineering science courses or acceptable equivalents prescribed by each admitting department.

2. A GPA of at least 2.00 must be maintained in all engineering courses taken to date.

Engineering Degree Program Application Procedures. Application forms may be obtained directly from the program/department of interest or the Office of Admissions or the Dean’s Office in the School of Engineering and Mines. Application for admission may be made to only one degree program at a time.

Transfer students may apply for admission to an engineering degree program concurrently with application to the University. Any admission to an engineering degree program in such a case will be contingent upon admission to the University. It is advisable for transfer students to contact the engineering department of interest for an evaluation of the comparable and approved coursework from other institutions that will meet the School of Engineering and Mines’ requirements.

Engineering Degree Program Application Deadlines. Students will apply for admission to a professional degree program during the term in which they are completing the foundation coursework (normally the fourth semester). Applications should normally be received by March 1. Applications are usually reviewed once per year, but may be reviewed at other times as positions are available.

Notice of admission status will normally be mailed by April 1.

Selection and Admission Process for Engineering Degree Programs. If the number of applications for admission 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

Two types of admission will be granted. Those students who are enrolled in the remainder of their foundation courses at the time of application will receive conditional admission. Final admission for those students depends on earning a minimum grade of C in those foundation courses completed during the semester of application. Final admission may be granted directly if the student has completed all the foundation courses satisfactorily and met the degree program’s admission criteria.

Additional students may be admitted to an engineering degree program at other times if positions become available and interim admissions are allowed. Except under special circumstances, these additional students must be enrolled at the University of North Dakota. Only those students who have received final or conditional admission status will be allowed to preregister for upper division engineering courses. Final admission status must be granted for actual enrollment in upper division engineering courses to occur.

Reapplication Procedure. Non-admission to any degree program may be appealed through the School of Engineering and Mines Program Appeals Committee. Reapplication may be made during the next application session.

ACADEMIC AND ENROLLMENT POLICY

General. Students will not be allowed to re-enroll in an engineering course which they have unsuccessfully completed until the second time the course is offered following their first enrollment, unless space is available. Unsuccessful completion is defined as either withdrawal after the last day to add (typically the tenth day of classes) or failure to achieve an acceptable grade.

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 School of Engineering and Mines will result if the conditions of probation are not met. For a student wishing to return to the School 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 School 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 School’s Program Appeals Committee, which is composed of one faculty member from each department and three student representatives.

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 School of Engineering and Mines to satisfy graduation requirements for a degree from the School 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 core requirements for transfer students.

COOPERATIVE EDUCATION
The programs offered by the School 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.

FRESHMAN YEAR

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 121, 122</td>
<td>General Chemistry I, II</td>
<td>(4)</td>
<td>(4)</td>
</tr>
<tr>
<td>Engr 101</td>
<td>Graphical Communications</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Math 165, 166</td>
<td>Calculus I, II</td>
<td>(4)</td>
<td>(4)</td>
</tr>
<tr>
<td>Phys 251, 251L</td>
<td>University Physics I</td>
<td>(4)</td>
<td></td>
</tr>
</tbody>
</table>

SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engr 201</td>
<td>Statics</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Engr 202</td>
<td>Dynamics</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Engr 203</td>
<td>Mechanics of Materials</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Econ 201</td>
<td>Principles of Economics</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>EE 206</td>
<td>Electrical Circuits</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Engl 125</td>
<td>Technical and Business Writing</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>(or Engl 120)</td>
<td>College Composition II</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Engr 200</td>
<td>Computer Applications in Engineering</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Math 265</td>
<td>Calculus III</td>
<td>(4)</td>
<td></td>
</tr>
<tr>
<td>Math 266</td>
<td>Elementary Differential Equations</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Phys 252/252L</td>
<td>University Physics II</td>
<td>(4)</td>
<td></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.

GENERAL EDUCATION REQUIREMENTS

The University requires completion of 39 credits of General Education Requirements (see General Education Requirements listing). Students enrolled in all Engineering programs must complete Philosophy 370, Ethics in Engineering and Sciences, or an approved alternative, and Economics 201, Microeconomics. All Engineering students should plan carefully the fulfillment of their university GER’s 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 School 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 Graduate School by the deadline: One week after the start of classes. A complete application includes:
  - Graduate School 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 Graduate School 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 AND PROJECTS

Student Societies. There are student chapters of each of the following professional and technical societies: American Institute of Aeronautics and Astronautics, American Institute of Chemical Engineers (AIChE), American Society of Civil Engineers (ASCE), Association of Engineering Geologists (AEG); Society of Energy Alternatives (SEA); American Society of Mechanical Engineers (ASME), Association of Undergraduate Geologists, Institute of Electrical and Electronics Engineers (IEEE), IEEE Computer Society, the Society of Manufacturing Engineers (SME) and the Society of Women Engineers (SWE).

Honor Societies. Eta Kappa Nu, Sigma Gamma Epsilon, and Tau Beta Pi are engineering and geology honor societies whose purpose is to recognize excellence in the scholarship.

Engineers’ Student Council. The Engineers’ Council of the University of North Dakota, founded in 1920, is a student organization representing all departments of the School of Engineering and Mines. Engineers’ Council, as a student chapter of the National Society of Professional Engineers (NSPE), is open to all engineering students. Its membership includes the vice president and one member of the student chapters of AIChE, ASCE, ASME, IEEE and SWE; the
vice presidents of Eta Kappa Nu, Sigma Gamma Epsilon, and Tau Beta Pi; and the engineering student senator.

Projects. The School actively encourages students to participate in engineering projects to gain experience in team activities involving students from other disciplines. Examples of typical projects include the concrete canoe, AgCAM - remote sensing from the International Space Station, steel bridge, fuel cell car, remote sensing, and UAVs.

DISTANCE ENGINEERING DEGREE PROGRAM

The Distance Engineering Degree Program (DEDP) offers baccalaureate degrees in chemical, civil, electrical and mechanical engineering via the Internet and on-campus laboratories. This program is offered in cooperation with the Division of Continuing Education at the University of North Dakota.

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, fax and email. For further information please contact the Division of Continuing Education at 1-800-342-8230.

The GRADUATE SCHOOL

Joseph N. Benoit, Dean

THE GRADUATE SCHOOL MISSION

The Graduate School 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 Graduate School 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.

Each year approximately 650 new students enroll for degrees in the Graduate School, and approximately 500 students receive master’s degrees and 50 students receive doctoral degrees. In addition, the Graduate School offers extensive off-campus program offerings through the Division of Continuing Education.

THE GRADUATE SCHOOL: GENERAL INFORMATION

The Graduate School provides qualified post-baccalaureate students with the opportunity for advanced study toward a graduate degree. The Graduate School promotes excellence in scholarship and creativity, and encourages original research and competency in technical and professional fields. It is responsible for general supervision of all graduate activity in the departments, schools, and colleges of the University.

The majority of the graduate courses are offered on the Grand Forks campus; however, each semester some graduate courses are offered off campus through cooperative agreements between the Graduate School and the UND Division of Continuing Education. A number of distance degree programs are offered throughout the state of North Dakota. Students wishing to enroll in distance courses and programs must follow all graduate school policies and procedures.

The Graduate School is a member of the Midwest Association of Graduate Schools, the Western Association of Graduate Schools, the American Indian Professional Association, and the Center for Academic Integrity. The Graduate School 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 Graduate School. Graduate School policy is set by the Graduate Faculty which is made up of the President, the Vice President for Academic Affairs, the Dean of the Graduate School, and members of the University faculty who have been approved for membership on the Graduate Faculty. Approximately 525 faculty are members of the Graduate Faculty.

The Graduate Committee is the executive body of the Graduate Faculty. It is composed of the Graduate Dean, the Associate Dean, thirteen faculty members that are elected by the Graduate Faculty to represent each of the academic areas, and one student member. The Committee formulates Graduate School policy, monitors program development on behalf of the Graduate Faculty, and serves as an appeal board for student petitions. Only members of the Graduate Faculty normally may serve on Faculty Advisory Committees and serve as advisors for graduate students.

GRADUATE SCHOOL ACADEMIC AREAS

The Graduate School is organized into thirteen academic areas. These areas and the programs or departments that comprise them are listed below.

Aerospace Sciences: Atmospheric Sciences, Aviation, Earth Systems Science & Policy, Space Studies
Basic Medical Sciences: Anatomy & Cell Biology, Biochemistry & Molecular Biology, Microbiology & Immunology, Pharmacology, Physiology & Therapeutics
Education: Educational Foundations & Research, Educational Leadership, Instructional Design & Technology, Teaching & Learning
Engineering: Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering
Fine Arts: Art, Music, Theatre Arts
Health Professions: Clinical Laboratory Science, Occupational Therapy, Physical Therapy, Physician Assistant
Human Development: Communication Sciences & Disorders, Counseling, Physical Education, Exercise Science & Wellness, Social Work
Humanities: History, Indian Studies, Philosophy & Religion
Mathematics and Natural Sciences: Biology, Chemistry, Computer Science, Geology & Geological Engineering, Mathematics, Physics
Nursing: Family & Community Nursing, Nutrition & Dietetics, Practice & Role Development (Nursing)
Social Sciences: Anthropology, Criminal Justice, Geography, Political Science, Public Administration, Psychology, Sociology

Speech and Language: Communication, English, Languages, Linguistics

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 Graduate School and serves as the Graduate School Curriculum Committee. The Graduate Committee is responsible for hearing appeals of decisions on student academic matters rendered by the Dean of the Graduate School. 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 Graduate School, any Associate Dean(s), and the appointed graduate student member. The graduate student member must be enrolled in the Graduate School and will serve a one-year term. The membership roster of the Graduate Committee is available from the Graduate School and is posted on the Graduate School web site.

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.

The Graduate School 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 University operates a variety of research centers such as the Bureau of Business and Economic Research, the Bureau of Governmental Affairs, the Bureau of Educational Services, the Center for Health Promotion and Prevention Research, the Center for Innovation, the Center for Rural Health, the Energy and Environmental Research Center the Institute for Ecological Studies, the Institute for Remote Sensing, and the Social Science Research Institute. The University also works closely with the North Dakota State Geological Survey and with the U.S. Department of Agriculture Human Nutrition Research Center, located adjacent to the campus.

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 Graduate School reports directly to the Dean and is primarily responsible for all aspects of Graduate School 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 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.

GRADUATE PROGRAMS

The University offers programs of study leading to the doctorate in 24 fields. Fifty-eight 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.

For information on graduate courses, prospective students should refer to the departmental statements in other parts of this Catalog, the Graduate School Section of this Catalog. Updates may also be available on the Graduate School WEB site. Courses with 500 series numbers are graduate courses and are normally open only to graduate students. Certain 400 level courses are approved for graduate credit. All courses listed in the Graduate School 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.

ADDITIONAL INFORMATION

For detailed information students should consult the Graduate School Section of this Catalog or go to the Graduate School website at: http://graduateschool.und.edu. Address inquiries to the Dean of the Graduate School, 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.nodak.edu.

GRADUATE PROGRAMS AND DEGREES

The following degree and certificate programs are offered through the UND Graduate School. Updates to this list may be found on the UND Graduate School web site.

<table>
<thead>
<tr>
<th>Program</th>
<th>Degrees Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy and Cell Biology</td>
<td>M.S., Ph.D.</td>
</tr>
<tr>
<td>Applied Economics</td>
<td>M.S.A.E.,</td>
</tr>
<tr>
<td>Art (See Visual Arts)</td>
<td></td>
</tr>
<tr>
<td>Atmospheric Sciences</td>
<td>M.S.</td>
</tr>
<tr>
<td>Aviation</td>
<td>M.S.</td>
</tr>
<tr>
<td>Biochemistry and Molecular Biology</td>
<td>M.S., Ph.D.</td>
</tr>
<tr>
<td>Biology</td>
<td>M.S., Ph.D.</td>
</tr>
<tr>
<td>Business Administration</td>
<td>M.B.A.</td>
</tr>
<tr>
<td>Career and Technical Education*</td>
<td>M.S.</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>M.S., M.Engr.,</td>
</tr>
<tr>
<td>Chemistry</td>
<td>M.S., Ph.D.</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>M.Engr., M.S.</td>
</tr>
<tr>
<td>Clinical Laboratory Science</td>
<td>M.S.</td>
</tr>
<tr>
<td>Communication</td>
<td>M.A.</td>
</tr>
<tr>
<td>Communication and Public Discourse</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Communication Sciences and Disorders</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Computer Science</td>
<td>M.S.</td>
</tr>
<tr>
<td>Counseling</td>
<td>M.A.,</td>
</tr>
<tr>
<td>Counseling Psychology</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Criminal Justice</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Early Childhood Education</td>
<td>M.S.</td>
</tr>
<tr>
<td>Early Childhood/Special Education</td>
<td>M.S., M.Ed.</td>
</tr>
<tr>
<td>Earth System Science and Policy</td>
<td>M.S., M.E.M., Ph.D.</td>
</tr>
<tr>
<td>Education-General Studies</td>
<td>M.S.</td>
</tr>
</tbody>
</table>
The School of LAW
Paul A. LeBel, Dean

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 mission of the School of Law is: 1) to educate students for professional service in the law and related professions; 2) to explore legal issues of special significance to North Dakota and the region; 3) to attract a well-qualified and diverse student body and to assist students in making career decisions; 4) to promote improvements in the law and legal system, the legal profession, and the administration of justice; and 5) to further the overall goals and objectives of the University of North Dakota. 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 Admissions Test. Admission is competitive. Applicants accepted for the 2006-2007 entering class had a median undergraduate Grade Point Average (GPA) of 3.35 and a median LSAT score of 151.

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 applicants’ file is completed before 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.

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 request an application packet from the Office of the Dean, School of Law, University of North Dakota, P.O. Box 9003, Grand Forks, ND 58202-9003. The University of North Dakota School of Law is a participating law school in the Law School Data Assembly Service. In order for the admission process to be completed by April 1 of each year, the applicant is strongly urged to make application directly to the School of Law the preceding fall.

Applicants for advanced standing may be admitted and given credit for satisfactory work completed in other accredited law schools, provided they otherwise comply with the admission requirements of the School.
The School of Medicine and Health Sciences

H. David Wilson, M.D., Dean and Vice President for Health Affairs

HISTORY AND MISSION

The School of Medicine and Health Sciences consists of medical, biomedical research and other health-related academic components which work together to address our mission of educating and preparing North Dakota residents as physicians, medical scientists and other health professionals for service to the people of this region and the nation, and to advance medical and biomedical knowledge through research. These components include:

1. A statewide, four-year curriculum for medical students leading to the M.D. degree
2. Postgraduate medical education (residency) programs of three to five years in duration leading to eligibility for board certification in family medicine, internal medicine, general surgery and psychiatry; a one-year transitional program is also offered
3. A continuing medical education program to address the career-long need of physicians and other health care personnel for continued learning
4. Graduate programs in the biomedical sciences leading to the M.S. degree, Ph.D. degree, and the combined M.D./Ph.D. degree in anatomy and cell biology; biochemistry and molecular biology; microbiology and immunology; and pharmacology, physiology and therapeutics
5. Postdoctoral research training programs in the disciplines noted above
6. Graduate programs leading to M.S. degrees in clinical laboratory science, occupational therapy and physician assistant programs
7. Undergraduate programs leading to the following degrees: B.S. in athletic training, B.S. in cytotechnology, and B.S. in clinical laboratory science
8. Undergraduate and graduate coursework in anatomy and cell biology; biochemistry and molecular biology; microbiology and immunology, and pharmacology, physiology and therapeutics

Each program noted above is fully accredited by its accrediting 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, Alzheimer’s, ALS (Lou Gehrig’s disease) and multiple sclerosis; cancer; preventive medicine; osteoarthritis; drug addiction; alcoholism in women, and eating disorders.

The Physician Assistant Program, established as a certificate program in 1970, is administered by the Department of Family and Community Medicine. 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 clinical 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 (HRD) 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 M.S. degree in physical therapy was added in 1991. The doctoral program in physical therapy was initiated in 2002. The B.S. in Athletic Training degree was approved in September 1990 by the North Dakota Board of Higher Education and is administered under the Department of Family Medicine through its Division of Sports Medicine.

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 mission. Departments included are anatomy and cell biology; biochemistry and molecular
biology; community medicine; family medicine; internal medicine; microbiology and immunology; neuroscience; obstetrics and gynecology; occupational therapy; pathology; pediatrics; pharmacology; physiology and therapeutics; physical therapy; radiology, and surgery. The statewide educational program of the school is coordinated through clinical campuses based at Bismarck, Fargo, Minot and Grand Forks.

The School of Medicine and Health Sciences issues a catalog biannually containing information on application to the medical school, including registration, fees, admissions, standards of scholarship, and courses. Interested students may write for the catalog or for other information to the Office of Student Affairs and Admissions, School of Medicine and Health Sciences, University of North Dakota, P.O. Box 9037, Grand Forks, North Dakota 58202-9037. Information is also available concerning all components of the School of Medicine and Health Sciences at: http://www.med.und.nodak.edu.

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>
<thead>
<tr>
<th>Minimum Semester Hours</th>
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<tbody>
<tr>
<td>Chemistry, including laboratory ..................................</td>
</tr>
<tr>
<td>Inorganic and Qualitative ........................................</td>
</tr>
<tr>
<td>Organic* ..........................................................</td>
</tr>
<tr>
<td>Biology, including laboratory ........................................</td>
</tr>
<tr>
<td>Physics, including laboratory ........................................</td>
</tr>
<tr>
<td>Psychology/Sociology ..............................................</td>
</tr>
<tr>
<td>Language Arts (English, Speech, etc.) ..........................</td>
</tr>
<tr>
<td>College Algebra or higher math ....................................</td>
</tr>
<tr>
<td>A student may substitute a semester or quarter of biochemistry for the final semester/quarter of organic chemistry.</td>
</tr>
</tbody>
</table>

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, psychology and sociology 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 available on July 1 and must be received no later than November 1 of the year preceding desired admission.

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 Division of Sports Medicine, Department of Family Medicine. This four-year degree is designed to prepare entry-level athletic training professionals. The academic program is currently accredited by CAATE. Graduates are eligible to take the national certification test administered by the NATA 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 Division of Sports Medicine.

Clinical Laboratory Science (CLS)

The Department of Pathology offers a four-year academic program leading to the degree of Bachelor of Science in Clinical Laboratory Science (formerly medical technology). The degree includes two years of pre-clinical 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 clinical laboratory science by completing a 4 + 1 curriculum option. Students may take much of the professional curriculum on-line through distance learning. Advancement from pre-clinical laboratory science to the clinical laboratory professional curriculum is based on a competitive application process. Application for advancement to the professional education component must be made. The CLS 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.

Clinical Laboratory Science Categorical Certificate

The Department of Pathology offers a CLS Categorical Training Certificate which provides advanced skills to baccalaureate-prepared students to become eligible to work in a high-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 36 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, Chemistry/Uroanalysis, Microbiology, or Hematology/Coagulation. 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.

Cytotechnology

The Department of Pathology offers a four-year, degree-granting program leading to the Bachelor of Science in Cytotechnology. A Certificate in Cytology is available to students who possess a baccalaureate degree with at least 20 semester hours of biosciences and 8 hours of chemistry prior to admission. The program has been fully approved by the AMA Board of Schools since 1967 and became a degree-granting program in 1975. Applications are available from the cytotechnology program director (or online at: http:// pathology.med.und.nodak.edu/gytotech/index.cfm) in the Department of Pathology and must be submitted by January 1 for the senior-year program beginning the following Fall semester.

Histotechnician Certificate Program

The Department of Pathology 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 the clinical affiliation site. The Histotechnician Certificate Program is actively seeking accreditation from the National Accrediting Agency for Clinical Laboratory Science (NAACLS). The program has achieved “serious applicant status,” which gives eligibility for the students to complete the national certification exam.

GRADUATE PROGRAMS

The Ph.D., M.S. and joint M.D./Ph.D. programs are offered in each of the biomedical science departments. Professional graduate programs are offered in physical therapy, physician assistant studies, and clinical laboratory science. All of these programs are described in the graduate school section of this bulletin.

Clinical Laboratory Science

The Department of Pathology offers a Master of Science degree program in Clinical Laboratory Science. The degree is a non-thesis
option that is offered both on campus and through on-line distance learning. It provides a broad medical science background as well as experiences in quality management and laboratory finance. This curriculum is designed to prepare students for careers as administrative laboratory directors, clinical laboratory consultants, technical supervisors or laboratory educators.

**Clinical Laboratory Science Management Certificate**

The Department of Pathology offers a Clinical Laboratory Science (CLS) Management Certificate at the graduate level. It provides advanced skills to practicing laboratory professionals in health administration, leadership, conflict management, quality assurance, and health informatics. The program is offered by distance learning over the Internet.

**Occupational Therapy**

The Occupational Therapy Department offers a five-and-a-half-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 web site at: http://www.med.und.nodak.edu/depts/o/home.htm.

The Occupational Therapy program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE). For information regarding accreditation, contact the ACOTE at (301) 652-2682, or 4720 Montgomery Lane, PO Box 31220, Bethesda, Maryland 20824-1220. All basic professional programs must comply with the Standards for an Accredited Educational Program for the Occupational Therapist, 1998. 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). Many states require licensure in order to practice; however, 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 is available by contacting the Occupational Therapy Department at Casper College, Casper, WY; telephone 307-268-2613. Wyoming residents may call 1-888-699-0006.

**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.

Applications for admission to the professional program may be obtained from the Department of Physical Therapy after December 1 and must be returned by March 1 of the calendar year the student wishes to gain entrance into the professional program.

**Physician Assistant Program**

The Department of Family and Community Medicine offers a Master of Physician Assistant Studies. This 22-month graduate program is accredited by the Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA). Enrollment is limited to registered nurses with a minimum of two years professional nursing experience. The program has also initiated a “Pilot Program” for other clinically practicing health care professionals who have a minimum of three years of clinical experience in their field of certification/licensure. 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 complete an application form, visit our website at: http://www.med.und.nodak.edu/depts/pa.

**OTHER ACTIVITIES**

**Laboratory Education from North Dakota**

Laboratory Education from North Dakota (LEND) is a program within the Department of Pathology. The LEND Program 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. Students earning undergraduate and graduate credit can apply the credits earned toward degrees in clinical laboratory science.

**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 junior high 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 class to qualified American Indian students.

**SCHOOL OF MEDICINE AND HEALTH SCIENCES 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 what was formerly known as 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 was dedicated and opened at Sixth Avenue North and Hamline. It houses the Clinical Education Center and the Evan Lips Auditorium. In the fall of 2004, the Neuroscience Research Facility was completed and 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.

**NORTH DAKOTA MEDICAL CENTER**

The Medical Center, created by an act of the North Dakota Legislature in 1945, is an administrative unit of the university. Its purpose is to provide facilities for the “coordination, improvement, expansion, and unification of health and welfare activities of the State, its agencies, its political subdivisions and its private practitioners.” The center is “concerned with the training of physicians, nurses and all other personnel concerned with the improvement and preservation of the health of the people of North Dakota.”

The Medical Center includes the School of Medicine and Health Sciences and the USDA Human Nutrition Research Center.
The College of Nursing
Chandice Y. Covington, Dean

MISSION AND ORGANIZATION

The mission of the College of Nursing is to educate individuals for professional roles in nursing and nutrition. The College strives to enhance the health of people in the region by preparing leaders in nursing and nutrition through innovative, accessible programs, and significant faculty and student scholarship and service.

The College is committed to fostering critical thinking and intellectual inquiry in a caring environment that assumes a positive regard for others and that affirmatively supports and promotes diversity. Students are encouraged to be self-directed and participatory learners and to commit themselves to learning as a life-long process that is essential to meeting the needs of society in a constantly changing environment.

The College of Nursing offers professional programs with a foundation in the liberal arts leading to undergraduate degrees in nursing, community nutrition, and dietetics. Graduates of the nursing program are prepared in all areas of basic clinical nursing practice, have a solid foundation for graduate school, and are eligible to sit for the national licensing examination for registered nurses (NCLEX-RN). The 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. The major in community nutrition is designed to enable students to develop a thorough understanding of nutrition and the ability to communicate those principles to the public. Graduates are prepared to work cooperatively with other professionals in improving the overall health of individuals and communities.

Graduate specialties within the masters program in nursing include: Anesthesia Nursing, Psychiatric and Mental Health Nursing, Clinical Nurse Specialist in Nursing Therapeutics, Nursing Education, Health Administration and Family Nurse Practitioner preparation. Admissions to the Health Administration and Clinical Nurse Specialist in Nursing Therapeutics Specializations are on hold at the time of this printing. The Ph.D. in nursing focuses on research with vulnerable and diverse populations.

The College of Nursing includes two nursing departments: Family and Community Nursing and Practice and Role Development and the Department of Nutrition and Dietetics. The two departments in nursing jointly administer the undergraduate and graduate nursing programs, while the Department of Nutrition and Dietetics oversees the undergraduate programs in community nutrition and dietetics and a minor in nutrition.

ACCREDITATION

The Coordinated Program in Dietetics is accredited by the Commission on Accreditation for Dietetics Education of the American Dietetic Association.

The graduate and undergraduate nursing programs are approved by the North Dakota Board of Nursing and accredited by the Commission on Collegiate Nursing Education. The nurse anesthesia program is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs.

DEGREES AND REQUIREMENTS FOR GRADUATION

The College of Nursing offers the following degrees to students who successfully complete the prescribed courses 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.)

All programs within the College of Nursing 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 in this regard are encouraged to consult with the regulatory board in the appropriate state prior to applying for admission to a program. Additionally, many field work and clinical facilities are currently requiring proof of immunizations, drug testing, fingerprints, and/or criminal background checks. Students are responsible for any associated costs.

NURSING PROGRAM

Admission and Progression Requirements

Students who wish to pursue an undergraduate degree in Nursing should first apply to the University to be admitted as pre-nursing majors in the College of Nursing. Once a pre-nursing major has been declared, a nursing advisor will be assigned. Students must complete a formal application to the College of Nursing and be approved for admission by the College before enrolling in the nursing curriculum. See nursing major listing for specific requirements for admission and progression. 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. Since the College of Nursing strives to reflect current trends in the nursing profession, there may be on-going changes in the curriculum.

Students with Disabilities

The UND College of Nursing is committed to providing equal access to qualified students who experience a disability in compliance with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act (ADA). Qualified students with disabilities have the right to request accommodations and will be provided with those accommodations which meet their needs and are appropriate.

Disabilities Covered by the ADA

Students with disabilities who may receive accommodations under the ADA experience learning, physical, sensory, vision, health, or psychological disabilities which substantially affect a major life activity (such as reading, writing, walking, communicating, seeing, hearing.) Some students have “non-apparent” disabilities such as learning, depression, Attention Deficit Disorder, HIV/AIDS, diabetes, arthritis, etc and may also be covered under ADA.
Student Disclosure

Students who seek reasonable accommodation for a disability should register with UND’s Disability Support Services. This is the office that determines a student’s eligibility for accommodations and recommends appropriate accommodations. DSS is located in McCannel Hall #190, 701-777-3425, dss@und.nodak.edu. If students are not sure they have a disability, but question the functional abilities (common tasks) that may be required to be successful in the nursing program, they should talk with the Director of Student and Alumni Affairs. The director also assists the students with disabilities who have registered with DSS in considering and arranging any recommended accommodations.

Additional information on requesting accommodations in nursing can be accessed on the College of Nursing web site at: http://www.nursing.und.edu under “Nursing Undergraduate” or is available on request.

Scholarships and Financial Aid

Each year, nursing majors may apply for College of Nursing scholarships. Awards and criteria are listed in the College of Nursing Undergraduate Student Handbook, also available on the Nursing Undergraduate web pages. Selection is based on a variety of factors including GPA, financial need, disadvantaged background, interest, and potential nursing ability. Additional information is available from the Undergraduate Nursing Student Handbook. 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. A listing of selected web sites which feature scholarships and loans for nursing education is available from the College of Nursing web site.

Cooperative Education

Elective Cooperative education experiences are offered through the College to students who have completed two semesters in the nursing program. Students have the opportunity to perform skills learned in prior and concurrent nursing courses while under the guidance of agency staff. Students can increase their understanding of specialty areas within nursing. Each learning/working experience is individualized according to the student’s prior academic and work experiences and the needs of the employing agency.

Student Organizations

College of Nursing Student Council. The College of Nursing supports a student council that represents the students within the university student governance.

Nursing Student Association. NSA is the nursing student’s preprofessional organization. UND-NSA is affiliated with the North Dakota Student Nurses Association and the National NSA.

Nursing Honor Society. Eta Upsilon is the UND chapter of Sigma Theta Tau, the international honor society for nursing. Sigma Theta Tau fosters excellence, scholarship, and leadership in nursing to improve health care worldwide.

Graduate Studies

The College of Nursing offers graduate coursework leading to a Master of Science degree with a major in nursing and a Doctor of Philosophy in nursing. Students interested in graduate study may contact the Director of Graduate Studies in the College of Nursing. Consult the Graduate School section of this catalog for further information or visit our web site at http://www.nursing.und.edu/.

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 the last class day on the academic calendar prior to the break for spring semester recess. 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 (see department listing). 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.

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-acceptance application. Re-acceptance into the program will be on the basis of space available.

Additional expenses. The professional phase of the program has additional expenses due to supervised practice experiences, travel, and professional activities. Additionally, the schedule of classes and supervised practice experiences must have precedence in planning other time commitments, thus limiting employment opportunities. Definite plans for financing the costs of the two years of the professional phase should be arranged prior to application. An estimate of expenses is available from the Department of Nutrition and Dietetics. Financial aid and scholarships are available from various sources. The UND Financial Aid Office can assist in determining which resources are available to individual students.
Community Nutrition

The community nutrition curriculum is designed to allow students to develop an in-depth understanding of nutrition based on the biological and social sciences; the ability to communicate nutrition principles effectively and accurately to the public; and the ability to participate as a team member with other community and health care professionals. Through coursework and supervised practice 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.

Students majoring in community nutrition select from two options. A graduate who completes N&D 441, Advanced Nutrition, 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.

Cooperative Education

The opportunity to develop individualized cooperative education experiences is offered to students in the Department of Nutrition and Dietetics. This experience allows students to integrate learning from courses with professional work experiences in nutrition and dietetics.

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 Student Council. The College of Nursing supports a student council that represents the students within the UND student government, including students with majors in the Department of Nutrition and Dietetics.

The Office of

STUDENT ACADEMIC SERVICES

HISTORY AND SCOPE

The Office of Student Academic Services was originally founded in 1955 as University College, an academic unit which enrolled all freshman students, whether or not they had decided upon a specific major. Today, the Office of Student Academic Services provides students who have not decided on a major the opportunity to adjust to their environment, to measure their abilities, and to discover their special interests. After deciding on a major students will advance to one of the University’s seven colleges and schools which offer undergraduate degrees. These include the John D. Odegard School of Aerospace Sciences, College of Arts and Sciences, the College of Business and Public Administration, the College of Education and Human Development, the School of Engineering and Mines, the School of Medicine and Health Sciences, and the College of Nursing.

ADMISSION AND ACADEMIC ADVISING

As soon as new students who have not decided on a major have been admitted to the University, their information is forwarded to the Office of Student Academic Services. The Office of Student Academic Services has the responsibility for housing the records of all undecided students and for assigning each to an appropriate academic adviser. All students who have not decided on a major should meet with their adviser on a regular basis and should consult with their adviser preceding enrollment in classes each term.

TRANSFER TO A DEGREE COLLEGE

When a student decides upon an academic major, the records of the student are advanced to the appropriate degree-granting college.

To declare a major, a student must call or go to the office of the college which grants the degree the student wishes to pursue. The new college will request the student’s records from Student Academic Services.

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.

"GETTING STARTED" FRESHMAN REGISTRATION PROGRAM

The Office of Student Academic Services conducts a special summer registration program each year to allow incoming freshmen the opportunity to arrange their fall semester class schedules and learn about the University. This program allows each student to obtain individual attention from academic advisers, along with the opportunity to receive information to aid in a smooth transition to the University. Students accepted for admission to the University are invited to participate in the Getting Started Program.

"GETTING STARTED" TRANSFER REGISTRATION PROGRAM

Scheduled in early spring, Student Academic Services facilitates a one-day registration and orientation program for admitted transfer students who will be entering UND for the fall semester. Transfer students are able to meet with an advisor, learn more about UND programs and services, and acclimate to the campus environment.

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

Summer course offerings are for everyone, from juniors in high school to senior citizens. During the Summer Session, courses are offered for students who have completed their junior year in high school and wish to get an early start toward earning college credit. Other typical groups of students found on campus during the summer include: teachers and administrators working toward advanced degrees, students from other colleges, freshmen 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.summer.und.edu, or contact the Summer Sessions Office, University of North Dakota, P.O. Box 8375, Grand Forks, ND 58202-8375.
Undergraduate Departmental Courses, Programs

This section of the catalog includes, in alphabetical order, department and program area requirements and course descriptions.

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

All academic units are expressed in terms of semester credit, which represents one class period of lecture or two hours of laboratory for each of the weeks that constitute a semester.

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

(Account)

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

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.

Program Learning Goals

As a result of active participation in the Department’s program(s) of study, accounting graduates will:

1. Understand and be familiar with fundamental business knowledge to include accounting and business terminology, concepts, principles, methods, and procedures.
2. Possess computer skills relevant to entry level accounting professionals.
3. Demonstrate critical thinking skills applicable to accounting and business decisions.
4. Understand the need to continually acquire knowledge and skills to effectively address emerging issues and complex business problems.
5. Be able to work effectively individually and in teams, and possess good oral and written communication skills.
6. Be aware of the ethical issues related to business and their chosen profession and career path.

In achieving this mission, faculty place the highest emphasis on teaching and learning. In addition, the importance of scholarly activities and service is recognized by faculty.
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. is a joint program in finance and accounting, provides some flexibility for students to tailor their programs of study. As such, it is designed primarily for individuals interested in becoming a Certified Management Accountant (CMA) 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.

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. General Education Requirements (see University GER listing).

II. College of Business and Public Administration Requirements, see College listing and including:

<table>
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<td>(3)</td>
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<td>Personal Productivity with Information Technology</td>
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<td>Introduction to Psychology</td>
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<tr>
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<td>Accounting Information Systems</td>
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<td>Business Law</td>
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</tr>
<tr>
<td>Acct 320</td>
<td>Accounting for Production</td>
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</tr>
<tr>
<td>Acct 401</td>
<td>Advanced Accounting</td>
<td>(3)</td>
</tr>
<tr>
<td>Acct 405</td>
<td>Assurance Services</td>
<td>(3)</td>
</tr>
<tr>
<td>Acct 411</td>
<td>Business Income Taxation</td>
<td>(3)</td>
</tr>
<tr>
<td>Acct 450</td>
<td>Contemporary Issues in Accounting</td>
<td>(2)</td>
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Two courses selected from the following:

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<td>Fund Accounting</td>
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<tr>
<td>Acct 403</td>
<td>Contemporary Accounting Theory</td>
<td>(3)</td>
</tr>
<tr>
<td>Acct 406</td>
<td>Independent Assurance</td>
<td>(3)</td>
</tr>
<tr>
<td>Acct 410</td>
<td>Federal Individual Income Tax</td>
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</tr>
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<td>Acct 412</td>
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<td>Acct 416</td>
<td>Advanced Business Law</td>
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IV. Students must complete all 120 semester hours minimum of accounting courses.

B.B.A. WITH MAJOR IN MANAGERIAL FINANCE AND ACCOUNTING

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. General Education Requirements (see University GER 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>Fin 350</td>
<td>Financial Statement Analysis</td>
<td>(3)</td>
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<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>
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At least three above-division courses from Accountancy or Finance.

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 and 24 hours of business courses and at least 150 semester hours of college courses.

The B.B.A. program meets the current requirements for accounting and business courses, however, the B.B.A. 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. At this time, the most likely graduate alternative would be 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.

THE CERTIFIED FINANCIAL MANAGER (CFM) EXAMINATION

The Institute of Management Accountants (IMA) establishes the standards and criteria for achieving the CFM designation. The CFM examination is very similar to the CMA examination except that the CFM examination is more focused on finance issues.
For more information regarding any of the above certifications, please visit the website of the sponsoring organization.

As a result of changing work conditions, both programs of study should be considered as minimums necessary for future success in the chosen designation.

Courses

200. Elements of Accounting I. 3 credits. Basic principles of the complete accounting cycle. F, S

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

218. Advanced Spreadsheet Applications. 3 credits. Prerequisites: Acct 201 and ISys 117. Corequisite: Acct 201. Advanced techniques in computer spreadsheet applications. F, S

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

301. Intermediate Accounting I. 4 credits. Prerequisite: Acct 201 and prerequisite or corequisite: Acct 218; Sophomore, Junior or Senior Standing; declared and pre-CoBPA majors only. Concepts, time value of money, current assets, current liabilities, plant and equipment, and intangibles. F, S

302. Intermediate Accounting II. 3 credits. Prerequisites: Acct 301; Junior or Senior Standing; declared CoBPA majors only. Corporations, long-term liabilities, investments, statement analysis, and cash flow statement. F, S

309. Accounting Information Systems. 3 credits. Prerequisites: Acct 301; Junior or Senior Standing; declared CoBPA majors only. 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. F, S

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

320. Accounting for Production. 3 credits. Prerequisites: Acct 201 and prerequisites or corequisites Acct 218; Sophomore, Junior or Senior Standing; declared and pre-CoBPA majors only. Principles and techniques used to account for and analyze costs incurred to produce products or services. F, S

360. International Accounting. 3 credits. Prerequisites: Acct 201; Junior or Senior Standing; declared CoBPA majors only. 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. S

397. Cooperative Education. 1-12 credits; may be repeated to a total of 12 credits. Prerequisites: Acct 301, 320; minimum 2.70 GPA overall; approval of the Director of Accounting Cooperative Education. On the job compensated work experience in various areas of Accounting. S-U grading only. F, S, SS

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

403. Advanced Accounting Theory. 3 credits. Prerequisites: Acct 401 or consent of instructor; declared CoBPA majors only. 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. F, S

405. Assurance Services. 3 credits. Prerequisites: Acct 302, 309; Econ 210; Junior or Senior Standing; declared CoBPA majors only. Explores methods of improving the quality of information or its context for decision makers. Examples include assurance services 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. F, S

406. Independent Assurance. 3 credits. Prerequisites: Acct 405 or consent of instructor; declared CoBPA majors only. Auditing and assurance theory as applied by independent accountants. F, S

410. Federal Individual Income Tax. 3 credits. Prerequisites: Acct 201; Junior or Senior Standing; declared CoBPA majors only. 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. F, S

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

412. Advanced Tax. 3 credits. Prerequisites: consent of instructor; declared CoBPA majors only. Unified transfer tax, trusts and estates, other contemporary topics as appropriate, and techniques of tax research. S

450. Contemporary Issues in Accounting. 2 credits. Prerequisites: Acct 302, 405; Senior Standing; declared CoBPA majors only. Corequisite: Acct 405. A critical analysis of contemporary issues in accounting. Writing and oral presentations are required. F

494. The Literature of Accounting. 1-3 credits, repeatable to 6 credits. Prerequisite: consent of instructor; declared CoBPA majors only. Directed studies in the recognized journals, periodicals, and professional publications of the field.

Business Law

315. Business in the Legal Environment. 3 credits. Prerequisite: Sophomore, Junior or Senior Standing. Prerequisite or corequisite: Acct 201 and Econ 202; minimum total of 50 credit hours; declared and pre-CoBPA majors only. The legal environment of business, governmental regulation, contracts, and property. F, S

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

416. Advanced Business Law. 3 credits. Prerequisites: Acct 316 and Senior Standing; declared CoBPA majors only. Advanced topics and contemporary issues in business law including ethics, legal representation in business, and the impact of selected governmental regulations on businesses. F, S

Anatomy and Cell Biology

(Anat)

Atkinson, Carlson (Chair), Carr, Dunlevy, Grove, Hunt, Jackson, Liu, Pyle, Rieke, Ruit, Smyser and Watt

Courses

204. Anatomy for Paramedical Personnel. 3 credits. Two lectures per week presenting a system-based study of human gross anatomy. F, S

204L. Anatomy for Paramedical Personnel Laboratory. 2 credits. Laboratory exploration of human gross anatomy to complement Anatomy 204. Prerequisite or Co-requisite: Anat 204. F, S

490. Directed Studies in Anatomy. 1-3 credits (repeatable to a maximum of 6 credits). Supervised studies and/or laboratory experiences in morphology. F, S, SS

498. Internship in Anatomy. 1-15 credits (repeatable to a maximum of 15 credits). Prerequisite: Junior or Senior standing and instructor consent. In-depth study and/or laboratory experiences in morphology in fields of faculty specialization. F, S, SS

Anthropology

(Anth)

Cuozzo, Leach (Chair), Mikulak, Reed, Scharf and Stubblefield

College of Arts and Sciences

An undergraduate major in anthropology can serve as the nucleus for a general liberal arts education, or as the prerequisite for a graduate education that will qualify a person for positions in (1) college and university teaching, (2) research, and (3) administrative and applied positions in government, non-governmental organizations, and museums. American anthropology is divided into four main sub-areas—archaeology, cultural anthropology, linguistic anthropology, and physical anthropology. Undergraduate training includes work in all four areas. Anthropology at UND is especially strong in archaeology and most students have an opportunity to work on archaeological excavations or in the laboratory. Both a major and a minor are offered in anthropology.

B.A. WITH 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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

33 Major Credits including:

Anth 170 ........ Introduction to Biological Anthropology ..................(3)
Anth 171 ........ Introduction to Cultural Anthropology ..................(3)
Anth 172 ........ Introduction to Archaeology .................................(3)
Anth 480 ........ Senior Capstone Seminar .................................(3)

Method and Theory .................................................................(9)

3 hours from (Cultural):

Anth 350 ........ Ethnographic Methods .................................(3)
Anth 371 ........ Cultural Dynamics ...........................................(3)
Anth 372 ........ Culture Theory .................................................(3)

3 hours from (Archaeology):

Anth 300 ........ Archaeological Laboratory Methods ...................(3)
Anth 375 ........ Women in Prehistory ...........................................(3)

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University of North Dakota

Courses

171. Introduction to Anthropology. 3 credits. An introduction to the breadth of enquiry 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.

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. FS

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; intercultural and international relationships; 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. FS

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 they formulate research problems and conduct field work; 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. FS

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 emergence of early humans, the prehistoric development of world cultures, and the interplay of biological, social, and cultural factors in present day societies. On demand.

209. Special Topics. 1-4 credits. Repeatable when topics vary. FS

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 relevances to death investigation in the United States, and the theories and techniques applied to skeletal identification. On demand.

300. Archaeological Laboratory Methods. 3 credits. Prerequisites: Anth 172 and permission of instructor. 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. S

309. Special Topics. 1-4 credits. Repeatable when topics vary. FS

325. Human Origins. 3 credits. Prerequisites: Anth 170 or consent of instructor. 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. On demand.

330. Human Variation. 3 credits. Prerequisite: Anth 170 or consent of instructor. An examination of the range of human physical variation, with a special emphasis on its adaptive nature. On demand.

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.

340. Medical Anthropology. 3 credits. An examination of the human biological and cultural responses to health and disease as seen from an anthropological perspective. FS

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. FS

346. Analysis of Forensic Evidence. 3 credits. Pre- or Corequisites: Anth 345; Forensic Science majors, Criminal Justice majors and minors, and Anthropology majors only, or instructor’s consent. Emphasis on the practical applications of the forensic sciences. Whenever possible and practical, hands-on exercises will reinforce course topics. FS

350. Ethnographic Methods. 3 credits. Prerequisite: Anth 171 or by special permission. 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. On demand.

370. Language and Culture. 3 credits. Prerequisites: Anth 171 or consent of instructor. Fundamentals of modern linguistics; utility of linguistic concepts of culture; interaction of language with other cultural subsystems. FS

371. Cultural Dynamics. 3 credits. Prerequisite: Anth 171. 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, ethnography and anthropology’s roles with respect to social policy. FS

372. Culture Theory. 3 credits. Prerequisite: Anth 171. 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. Once every 3 semesters.

373. Indi ans of Latin America. 3 credits. Prerequisites: Anth 171. 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. Every third semester.

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.

376. The Aztec, Maya and Inca. 3 credits. Prerequisite: Anth 172. An examination of the high civilizations of Latin America with focus on the Aztec, Maya and Inca. Every third semester.

377. North American Archaeology. 3 credits. Prerequisites: Anth 172 or consent of instructor. 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, ethnography and anthropology’s roles with respect to social policy. FS

378. Physical Anthropology Method and Theory. 3 credits. Prerequisite: Anth 170. A discussion of current theoretical arguments within the field of physical anthropology and the techniques used to examine them. FS

379. Culture Area Studies. 3 credits. May be repeated to maximum of 6 credits. A survey of peoples and cultures of selected areas. Selections based upon staff and student interest. FS

380. Field Techniques in Archaeology. 1-6 credits. Prerequisites: Anth 172 or consent of instructor. SS

388. Method and Theory in Archaeology. 3 credits. Prerequisites: Anth 172 or consent of instructor. This course explores how archaeologists reconstruct the past: how they formulate research problems and conduct field work; what field and laboratory analytical tools they employ; and how they use data, models, and theory to explain culture change. Techniques, methods, and theoretical frameworks used in modern prehistoric archaeology are examined. Readings in the professional literature, case studies, and guest lectures provide vivid examples of archaeologists in thought and action. FS

389. Archaeological Origins of Plant & Animal Use. 3 credits. Prerequisite: Anth 170. 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 interactions between humans and their environment. The course includes an introduction to basic principles of quantitative and descriptive methods, both in field and in the laboratory. SS
439. Human Osteology. 4 credits. Prerequisites: Anth 170 or Anth 270 or Anat 204 or consent of instructor. 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 palaeoanthropology, palaeopathology, forensic anthropology, and vertebrate anatomy. F.

441. Forensic Anthropology Field School. 1-6 credits. Prerequisite: consent of instructor. This course is a hands-on exposure to the field and laboratory methods of forensic anthropology. SS

465. Culture, Illness and Health. 3 credits. Prerequisites: Anth 171 or consent of instructor. Examination of culturally-based beliefs and practices involved in maintenance of health and the handling of illness in non-Western and modern societies. S.

480. Senior Capstone Seminar. 3 credits. Prerequisites: Senior major status and completion of two of the three method and theory requirements (cultural, archaeology, physical); or departmental permission. 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. S.


492. Independent Studies. 1-4 credits. Consent of instructor. Independent research conducted under advisement with department faculty. Research is student-originated and developed. F.S.

494. Readings in Anthropology. 1-5 credits. Prerequisites: consent of instructor. 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. F.S.

497. Forensic Science Internship. 1-12 credits. Prerequisites: Junior or senior status, satisfactory completion of Chem 122 and Biol 151, and instructor consent. Students must enroll in this course after they have secured an internship at a law enforcement agency, crime laboratory or other institution providing procedural and/or analytic processing of evidence from criminal or civil proceedings. Credits obtained will be determined based on length and content of the internship and course responsibilities. S/U grading. F.S.SS

Art
Fink, Fundingsland, Ganje, Jones (Chair), Luber, Miller, Monsebroten, Paulsen, Smith and Widmer

The Art 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 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 Department is an accredited institutional member of the National Association of Schools of Art and Design.

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
- Fibers
- Painting
- Photography
- Printmaking
- Sculpture
- Mixed Media
- Time-based Media

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 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 (15 credits):
    - Art 112 Basic Design ................................................................. (3)
    - Art 114 Visual Persuasion .......................................................... (3)
    - Art 130 Drawing I ................................................................. (3)
    - Art 160 History of Art I .......................................................... (3)
    - Art 211 History of Art II .......................................................... (3)
    - Additional supportive courses (9 credits):
      - Art 212 Concepts of Art .......................................................... (3)
      - Art 230 Drawing II ............................................................. (3)
      - Any 200-level graphic design or new media course .................. (3)

- Studies in Studio Art outside emphasis area (12 credits):
  - 200-level two-dimensional studio art courses ................................ (3-6)
  - 300-level three-dimensional studio art courses ............................ (3-6)
  - 300-level two-dimensional studio art courses ............................ (3-6)
  - 300-level three-dimensional studio art courses ............................ (0-3)

- Studies in Art History (6 credits):
  - Any 400-level art history course ................................................. (3)
  - Any 400-level art history course ................................................. (3)

- Studies in Studio Art Emphasis Area (24 credits):
  - 200-level studio art courses ...................................................... (3-6)
  - 300-level studio art courses ...................................................... (0-12)
  - 400-level studio art courses ...................................................... (6-18)
  - 494 Professional Exhibition ....................................................... (3)

- Art Electives (12 credits):
  - Any 300/400-level studio art or art history course ...................... (3)
  - Any 300/400-level studio art or art history course ...................... (3)
  - Any 300/400-level studio art or art history course ...................... (3)

- Exhibition Requirement: 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 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 325. (See College of Education and Human Development for admission and licensing requirements.)

III. The program in Secondary Education, to include:

- T&L 325 Exploring Teaching in Secondary Schools ....................... (3)
- T&L 345 Curriculum Development and Instruction ........................... (3)
- T&L 350 Development and Education of Adolescents ..................... (3)
- T&L 386 Field Experience (Optional) ............................................. (1)
- T&L 390 Special Topic ................................................................. (1-3)
- ART 461 Methods and Materials of Teaching Middle and Secondary School Art .................................................. (3)
- T&L 433 Multicultural Education .................................................... (3)
- T&L 460 Microteaching ............................................................... (2)
- T&L 486 Field Experience ............................................................. (1)
- T&L 487 A full semester of student teaching, normally taken during the semester of graduation ................................................. (16)
T&L 488 .......... Senior Seminar .................................................................(1)

Art majors seeking secondary licensure must have an advisor in both the Art Department and the Department of Teaching and Learning.

B.F.A. WITH MAJOR IN GRAPHIC DESIGN AND NEW ART MEDIA

Candidates seeking admission to the BFA program in Graphic Design and New Art Media must submit an application to the chairperson who will then schedule a portfolio presentation and personal interview for the candidate with a committee consisting of three departmental faculty members. Candidates accepted for the program will be expected to maintain a high standard of excellence, demonstrate significant artistic growth, and a 3.00 grade point average in all art courses. Before advancement to upper-division status, all B.F.A. candidates must participate in review and evaluation by the departmental faculty.

Each student’s portfolio will be reviewed annually by departmental faculty, which will make a recommendation concerning the student’s status in the program. If probation is recommended, students may apply for readmission at the completion of a full semester. Readmission in the B.F.A. program in Graphic Design and New Art Media will be contingent upon faculty evaluation.

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

I. General Education Requirements (see University GER 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 (15 credits):

Art 112 .......... Basic Design .................................................................(3)
Art 114 .......... Visual Persuasion ..........................................................(3)
Art 130 .......... Drawing I .................................................................(3)
Art 210 .......... History of Art I .............................................................(3)
Art 211 .......... History of Art II .............................................................(3)

Additional supportive courses (12 credits):

Art 240 .......... Printmaking I ...............................................................(3)
Art 245 .......... Black and White Photography I ....................................(3)
Art 260 .......... Color Photography .......................................................(3)
Art 272 .......... Timebased Media I: Time design and Digital Media .......(3)

Studies in Studio Art outside emphasis area (9 credits from courses in drawing, painting, printmaking, photography, timebased media, sculpture, ceramics, fibers, or jewelry and metalsmithing):

Art 230 .......... Drawing II .................................................................(3)
200/300-level studio art courses ..........................................................(3)
200/300-level studio art courses ..........................................................(3)

Studies in Art History (9 credits):

Art 413 .......... History of Graphic Design ..........................................(3)
Any 400-level art history courses ..........................................................(3)
Any 400-level art history courses ..........................................................(3)

Studies in Graphic Design and New Art Media (24 credits):

Art 273 .......... Graphic Design Foundations ......................................(3)
Art 382 .......... Typography ...............................................................(3)
Art 480 .......... Advanced Graphic Design .........................................(3)
Art 481 .......... Graphic Design Internship .........................................(3)
Any additional graphic design courses .................................................(9)
494 Professional Exhibition ...............................................................(3)

Art Electives ....... (9 credits selected from courses in graphic design, timebased media, printmaking, photography, drawing, painting, sculpture, ceramics, fibers, jewelry and metalsmithing, or art history):

300/400-level studio art or art history course ......................................(3)
300/400-level studio art or art history course ......................................(3)
300/400-level studio art or art history course ......................................(3)

Exhibition Requirement:

All B.F.A. candidates are also required to produce a BFA Exhibition with the approval of their faculty advisor and in conjunction with the Art 494 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. General Education Requirements (see University GER 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 (15 credits):

Art 112 .......... Basic Design .................................................................(3)
Art 114 .......... Visual Persuasion ..........................................................(3)
Art 130 .......... Drawing I .................................................................(3)
Art 210 .......... History of Art I .............................................................(3)
Art 211 .......... History of Art II .............................................................(3)

Studies in Studio Art (18 credits):

Any 200-level two-dimensional studio art course ................................(3)
Any 200-level three-dimensional studio art course ................................(3)
Any 200-level studio art course ...........................................................(3)
Any 300/400-level studio art course ....................................................(3)
Any 300/400-level studio art course ....................................................(3)
Any 300/400-level studio art course ....................................................(3)

Studies in Art History (3 credits):

Any 400-level art history course ..........................................................(3)

Art Electives (6 credits):

Any 300/400-level studio art or art history course ................................(3)
Any 300/400-level studio art or art history course ................................(3)

MINOR IN VISUAL ARTS (Studio)

Required 21 credits including:

Art 110 .......... Introduction to the Visual Arts ......................................(3)
Art 112 .......... Basic Design .................................................................(3)
Art 130 .......... Drawing I .................................................................(3)
Art 230 .......... Drawing II .................................................................(3)
Additional studio art or art history courses ..........................................(9)

MINOR IN ART HISTORY

Required 24 credits including:

Art 112 .......... Basic Design .................................................................(3)
Art 120 .......... Introduction to Drawing and Color Materials ..............(3)
Art 211 .......... History of Art I .............................................................(3)
Art 211 .......... History of Art II .............................................................(3)
Additional 400-level art history courses .................................................(12)

College of Education and Human Development

MINOR IN VISUAL ARTS EDUCATION (Middle or Secondary) See Minor in Art above.

Courses

100. Introduction to Sculpture. 3 credits. Introduction for non-majors to sculpture materials, processes, and concepts. Appropriate art safety instruction will be included. FS

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. FS

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. FS

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. FS

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. FS

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. FS

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. FS

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. FS

201. Sculpture II. 3 credits. Prerequisite: Art 200. Continuation of Sculpture I. Appropriate art safety instruction will be included. FS

204. Jewelry and Metalsmithing I. 3 credits. This studio course is an investigation into the tools, techniques, and processes fundamental to the design and fabrication of contemporary wearable and non-wearable art executed predominantly in precious/semi-precious metals. The principles will be practiced and studied through individual projects, leading to proficiency for the making of body adornments, halloware, and similar fabricated objects. Appropriate art safety instruction will be included. FS

205. Jewelry and Metalsmithing II. 3 credits. Prerequisite: Art 204. A continuation and expansion of Jewelry and Metalsmithing I. Specialized techniques and pro-
cesses utilized in metal fabrication will produce works ranging from body adornment to 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. F, S

371. Fibers II. 3 credits. Coursework will consist of sample making and sustained projects woven on the loom. Techniques will include yarn dying. Appropriate art safety instruction will be included. F

380. Time-based Media II - Digital Video. 3 credits. Repeatable to 6. Prerequisites: ART 112, ART 272. Exploration of creative processes in digital video production. Students will acquire intermediate level knowledge of digital video and audio recording, sampling, sequencing, editing, manipulation and a basic level knowledge of digital motion graphic. Selected readings on the historical, critical, and technical development of video art will be included for in-class discussions. Appropriate art safety instruction will be included. F

381. Time-based Media III- Digital Compositing. 3 credits. Repeatable to 6. Prerequisites: ART 112, ART 272, ART 380. Exploration of digitally manipulated synthesis and integration of multiple two-dimensional and video source images into a single, seamless work. Focus on image processing tools in color, size, position, concept of matte, analysis and duplication of motion. Selected readings on technical development of digital compositing art will be included for in-class discussions. F

382. Typography. 3 credits. Prerequisites: ART 112 Basic Design, ART 114 Visual Persuasion, ART 130 Drawing I, or instructor consent. The theory 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. F

383. Time-based Media IV - Digital Effects. 3 credits. Repeatable to 6. Prerequisites: ART 112, ART 272, ART 380, ART 381. Exploration in computer-generated effects in video and motion graphic. Selected topics from mask editing, spatial filters, 3d filters, digital lighting, advanced scene integration, temporal manipulation, image tracking, and organic shape blending video rendering techniques will be explored. Selected readings on technical development of digital effects in art will be included for in-class discussions. Appropriate art safety instruction will be included. S/I or On Demand

397. Cooperative Education. Part-time, fall and spring, 1-3 credits, repeatable to 3 credits only. Full-time, fall, spring, and summer, 6 credits, not repeatable or interchangeable with part-time. Arranged with an employer prior to enrollment. Special permission is required. Regular grading only. F, S, S, S

400. Advanced Sculpture. 3 credits, repeatable. Prerequisites: ART 112, 114, 130, and 201. 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. F

401. Advanced Jewelry and Metalsmithing. 3 credits. Repeatable. Prerequisites: ART 112, 114, 130, and 205. 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. F

402. Advanced Painting. 3 credits. Repeatable. Prerequisites: ART 112, 114, 130, and 221. 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. F

403. Advanced Printmaking. 3 credits. Repeatable. Prerequisites: ART 112, 114, 130, and 340. Advanced work in all traditional and experimental print media, including photo-based printing, non-toxic printing processes, computer-generated printmaking and expansion of collaborative printing and construction of non-traditional multiples. Appropriate art safety instruction will be included. May be repeated for credit without limitation. F

404. Advanced Ceramics. 3 credits. Repeatable. Prerequisites: ART 112, 114, 130, 151, or 250, and 253 or consent of the instructor. Ceramic Sculpture, Raku, and Clay & Glazes will be offered on a rotation schedule once every two years. These courses have specific technical ceramic applications, which will be explored both on the beginning and advanced level within the respective course structure. Appropriate art safety instruction will be included. May be repeated for credit without limitation. F

405. Advanced Photography. 3 credits. Repeatable. Prerequisites: ART 112, 114, 130, 260, and 261. 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. F

406. Advanced Fibers. 3 credits. Repeatable. Prerequisites: ART 112, 114, 130, and 277. This course will involve the creation of fiber works in a range of media and techniques. Appropriate art safety instruction will be included. May be repeated for credit without limitation. F

407. Advanced Ceramics: Throwing. 3 credits. Repeatable. Prerequisites: ART 112, 114, 130, 151, or 250, and 253 or consent of the instructor. Ceramic Sculpture, Raku, and Clay & Glazes will be offered on a rotation schedule once every two years. These courses have specific technical ceramic applications, which will be explored both on the beginning and advanced level within the respective course structure. Appropriate art safety instruction will be included. May be repeated for credit without limitation. F

410. History of Art: Selected Topics. 3 credits. Study of varied topics in the history of art and architecture. May be repeated as title changes. F, S, S, S

413. History of Graphic Design. 3 credits. Prerequisites or co-requisites: ART 210, ART 281, Junior or Senior, cultural, aesthetic and technological influences of graphic design including the creative innovators who established graphic design as a profession. F
416. History of Art: Renaissance and Baroque. 3 credits. Prerequisites: Art 210 and 211. Study of European art and architecture from the fourteenth to the eighteenth century. F/S

417. History of Art: Museum Studies Practicum. 3 credits. Prerequisites: Art 210 and 211. Experience working in an art exhibition setting involving practical experience, research, a written paper and presentation. F/S

419. History of Art: Late 18th through the 19th Century Art. 3 credits. Prerequisites: Art 210 and 211. Study of the major artists and artistic movements from the French Revolution to Impressionism. F/S

423. History of Art: 20th and 21st Century. 3 credits. Prerequisites: Art 210 and 211. Study of art outside European traditions. Course topics will rotate to include the art of Asia, Africa, Oceania, and Native arts of the Americas. F/S

430. Advanced Drawing. 3 credits. Repeatable. Prerequisites: ART 112, 114, 130, 230. Further development of drawing concepts, comprehension, and search of various media, and styles. The course stresses the focus of one’s attitude towards developing a more personal visual statement in areas of personal interest. Appropriate art safety instruction will be included. May be repeated for credit without limitation. F/S

460. Methods, Materials and Philosophy: Art in the Elementary Classroom. 3 credits. Prerequisites: Sophomore standing in T&L or Art. 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-dimen- sional, and 3-dimensional projects, featuring multi-cultural and disciplined-based education. Appropriate art safety instruction will be included. F/S


480. Advanced Graphic Design. 3 credits. Repeatable. Prerequisites: Art 112, Art 114, Art 130, Art 273, or instructor consent. 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. S


483. Advanced Timebased Media: Alternative Presentation of Media. 3 cred- its, repeatable. Prerequisites: Art 112, Art 114, Art 130, Art 272, Art 380. Exploration of contemporary presentation methods and concepts in two-dimensional and time-based digital media through active consideration of space, time, audience and interactivity. Emphasis on the development of personal aesthetic and conceptual development. Histori- cal, critical, and technical readings will be included for in-class discussions. Appropriate art safety instruction will be included. S/2 or On Demand

490. Special Projects/Independent Research. 1-6 credits, no more than 6 in each discipline area. Pre- or corequisite: Senior standing and permission of instructor; formal contract must be signed with professor of record. 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. F/S,SS

491. Special Topics. 3 credits. Prerequisite: upper division status. 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. Letter grade only. F,S

494. Professional Exhibition. 3 credits Prerequisite: Permission of adviser. 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. F/S,SS

Arts and Sciences (A & S)

The College of Arts and Sciences offers a limited number of non- departmental courses. Among these are Arts and Sciences 294 (Directed Studies), 299 (Special Topics) and 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 Arts and Sciences 294, 299, and 499 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.

Courses

200. Introduction to the Nonprofit Sector. 2 credits. An introduction to manage- ment 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 lectures, workshops, and student presentations. F, S

225. Introduction to the Study of Women. 3 credits. An introduction to the study of women as subjects of scholarly enquiry, 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

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 re- quired 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. F, S, SS

252. Introduction to Canadian Studies. 3 credits. An interdisciplinary-team- taught course focusing on the historical, geographical, socio-cultural, literary, politi- cal, economic, and international qualities that make Canada and its communities both vibrant and unique. F

294. Directed Studies. 1-4 credits. Specially arranged individual tutorials, projects, or reading programs on a variety of subjects not covered by regular departmental offerings. May be initiated by students with approval of dean and departments involved, provided appropriate faculty members are willing. Repeatable as topics vary to 8 credits.

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. On demand

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.

450. Capstone Experience and Development. 1 credit. Prerequisite: A&S 200. Students will be asked to develop an integrative paper and complete a competency portfolio conveying what they have learned from the certificate program. Students are required to attend the American Humancins Management Institute. The American Humancins Management Institute is a 3-4 day, intensive national management institute, organized by students from across the country affiliated with American Humancins, Inc., featuring workshops, seminars and presentations. 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. $600-800), or pay their own expenses. Fund raising efforts provide a hands-on learning experience prior to the Institute. F

480. Feminist Theory. 3 credits. Prerequisite: A&S 225. Feminist theory examines the foundations of American feminism from enlightenment liberal to postmodern and standpoint theories. The course first develops then critiques these fundamental ap- proaches. Opportunities are provided to integrate mainstream and marginal experiences of feminist theory and its practice.

492. Senior Study, Women Studies. 1-4 credits. Prerequisite: A&S 225. Supervised independent study involving a theory paper, practicum experience, or a combina- tion of the two.

497. Internship. 1-6 credits (repeatable to 6 credits). Prerequisite: Permission of instructor and dean. 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 incor- porate education and professional development in a nonprofit agency. Studio One in- terno produce television news, weather, sports and entertainment segments and inter- views. Prospective Studio One interns must apply one semester in advance. Studio One internships are closed to pre-communication and communication majors. F, S, SS

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.

Athletic Training (See Family Medicine listing)
Atmospheric Sciences
(AtSc)

Askelson, Borho, Dong, Grainger, 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 graduate school listing). The degree is awarded in the John D. Odgeard School of Aerospace Sciences. A minimum of a 2.50 GPA is required for admittance into the program and for graduation.

Facilities

The Department of Atmospheric Sciences has several unique research and teaching facilities. The Regional Weather Information Center supports operational weather analyses and forecasting. Several teaching laboratories for use in cloud physics, air chemistry and radar meteorology are also available. Three primary research facilities are used in national and international research programs: a 5-cm wavelength, dual-polarization Doppler weather radar; a surface transportation weather test site; and an atmospheric and hydrologic observations ground site. Students are provided opportunities to participate in the research at the undergraduate level. Current research areas include clouds and climate change, ground/satellite remote sensing, atmospheric aerosols, radar meteorology, tropical meteorology, numerical modeling, data assimilation and surface transportation weather. Students also have the opportunity to produce and present broadcast weather segments.

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. General Education Requirements (see University GER listing).
II. Center for Aerospace Sciences requirements, see Aerospace Sciences listing.
III. The Following Curriculum:

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<tr>
<th>Freshman</th>
<th>First Semester</th>
<th>Second Semester</th>
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<tr>
<td>Engl 110, 125 College Composition I, Technical &amp; Business Writing</td>
<td>3</td>
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<tr>
<td>Math 165, 166 Calculus I, II</td>
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<td>CSci 120 Computer Programming I</td>
<td>4</td>
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<td>AtSc 110 Meteorology I</td>
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<td>Social Science</td>
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<td>Arts and Humanities</td>
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<tr>
<td>Free Electives</td>
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<tr>
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<tr>
<td>Math 265 Calculus III</td>
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<tr>
<td>Phys 251/251L University Physics I and Laboratory</td>
<td>4</td>
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<tr>
<td>Chem 121/121L General Chemistry I and Laboratory</td>
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<tr>
<td>AtSc 210 Introduction to Synoptic Meteorology</td>
<td>4</td>
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<td>AtSc 240 Meteorological Instrumentation</td>
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<tr>
<td>AtSc 270 Computer Concepts in Meteorology</td>
<td>3</td>
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<tr>
<td>Communications</td>
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<tr>
<th>Junior</th>
<th>First Semester</th>
<th>Second Semester</th>
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<tr>
<td>Math 266 Elementary Differential Equations</td>
<td>3</td>
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<tr>
<td>AtSc 350 Atmospheric Thermodynamics</td>
<td>3</td>
<td>(3)</td>
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<tr>
<td>Math 321 or Applied Statistical Methods or Econ 210 Intro. to Business &amp; Economics Statistics</td>
<td>3</td>
<td>(3)</td>
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<tr>
<td>AtSc 353 Physical Meteorology</td>
<td>3</td>
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<tr>
<td>AtSc 360 Dynamic Meteorology</td>
<td>3</td>
<td>(3)</td>
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<tr>
<td>Social Sciences</td>
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<td>Arts &amp; Humanities</td>
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<tr>
<td>#Atmospheric Sciences Elective</td>
<td>16</td>
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MINOR IN ATMOSPHERIC SCIENCES

Requires 20 credits including:

AtSc 110 Meteorology I .............................................. (4)
AtSc 210 Introduction to Synoptic Meteorology .......... (4)
AtSc 310 Introduction to Weather Forecasting .......... (3)

All other Atmospheric Sciences courses will satisfy the minor excluding the following:

AtSc 251, Advanced Weather Modification
AtSc 331, Aviation Meteorology II
AtSc 397, Cooperative Education
AtSc 494, Special Studies
AtSc 497, Internship

Courses

110. Meteorology I. 4 credits. Elements of the atmosphere with emphasis on those processes that affect the global atmospheric circulation. Includes laboratory. F/S
210. Introduction to Synoptic Meteorology. 6 credits. Prerequisites: AtSc 110, Math 146 or Math 165. 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. F
231. Aviation Meteorology I. 4 credits. Prerequisite: AtSc 110. A study of weather hazards, meteorological flight planning, aviation weather equipment and human factors in weather flying safety. F/S
240. Meteorological Instrumentation. 4 credits. Prerequisites: AtSc 110 and Math 103. 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. S/F
250. Introduction to Weather Modification. 3 credits. Prerequisite: AtSc 110. Provides a comprehensive introduction to basic concepts of weather modification currently undertaken and researched around the world. It includes application of fundamental meteorological processes to weather modification, a study of cloud physics and seeding theory, an introduction to the principles of weather radar, a review of past and current programs, and a discussion of related legal, societal, economical and environmental issues. F
251. Advanced Weather Modification. 3 credits. Prerequisites: AtSc 250. Provides students exposure to the practical aspects of weather modification operations. Introduction is given in the following areas: program design and evaluation, care and use of seeding materials and equipment, identification of seeding opportunities, and airborne delivery of seeding materials. Emphasis is given to safety, both on the ground and in the air. S
270. Computer Concepts in Meteorology. 3 credits. Prerequisite: AtSc 110 and an approved computer language course. Examines the need for and use of computers in atmospheric science. Topics will include the application of various computer concepts, such as numerical solution of linear differential equations and numerical integration, and numerical modeling techniques. S
310. Introduction to Weather Forecasting. 3 credits. Prerequisite: AtSc 210. 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. S
315. Broadcast Meteorology. 3 credits. Prerequisites: AtSc 310 and Communication or Atmospheric Sciences major. 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. F/S
331. Aviation Meteorology II. 3 credits. Prerequisite: AtSc 231. A study of aviation weather topics related to flight in high performance and air transport category aircraft. Includes a treatment of high altitude weather features, airborne weather radar, international weather, ground de-icing procedures and other topics. On demand.
340. Introduction to Radar Meteorology. 4 credits. Prerequisite: Phys 252. Introduction to principles and theory of microwave radar and its uses as a meteorological observation or research tool. Includes laboratory. F/S
350. Atmospheric Thermodynamics. 3 credits. Prerequisites: AtSc 270, Math 166, and Phys 251. 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. F

353. Physical Meteorology. 3 credits. Prerequisites: AtSc 110 and Phys 252. A study of atmospheric processes and properties from a physical standpoint. Includes boundary layer and upper atmosphere processes, cloud microphysics and electrodynamics, and atmospheric radiation. S

355. Surface Transportation Weather I. 3 credits. Pre- or corequisite: AtSc 310. An introduction to the concepts, practices and methodologies used in the surface transportation weather industry. Includes configuration, siting, and data management/quality control of environmental sensor stations, fundamentals of surface transportation weather forecasting, overview of winter road maintenance methods, and applications of geographical information systems technologies in a weather and road maintenance environment. S

360. Dynamic Meteorology. 4 credits. Prerequisites: AtSc 350 and Math 266. Corequisite: Math 266. Basic equations of motion, atmospheric thermodynamics, balanced motions, and atmospheric disturbances are examined on an introductory level. S

411. Synoptic Meteorology. 4 credits. Prerequisites: AtSc 210 and 360. 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. F

441. Radar Meteorology. 4 credits. Prerequisite: AtSc 340. Advanced radar theory, including basic radar principles, digital processing of radar signals, Doppler radar principles, displays, polarization techniques, and characteristic returns. Includes laboratory. S/2

450. Introduction to Cloud Physics Meteorology. 4 credits. Prerequisites: AtSc 350 and 353. A study of the physics of clouds with emphasis on micro-physical weather processes involved in cloud formation, precipitation production, and dissipation. Includes laboratory. F/2

455. Surface Transportation Weather II. 3 credits. Prerequisites: AtSc 355 or consent of instructor. Corequisite: AtSc 420. 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 surface transportation environment, introduction to pavement condition modeling, forecast verification methods, and an introduction to methods of maintenance decision-making. S

460. Mesoscale Dynamics. 3 credits. Prerequisite: AtSc 360. An introduction to mesoscale dynamics and forecasting. Topics include mesoscale circulations, warm and cold season weather systems, terrain induced weather systems and mesoscale models. F

492. Senior Project. 1 credit. must be repeated for a total of 2 credits. Senior status in meteorology, consent of adviser required. A capstone program demonstrating competency of undergraduate general atmospheric sciences and original student investigation of field or laboratory problems, after conference with a supervising faculty member of the department. S/U grading only. F,S,SS

493. Special Studies in Meteorology. 1-4 credits. Prerequisites: Upper division status and consent of instructor. May be repeated with change of subject matter to a maximum of four credit hours. Designed for those students who wish to pursue advanced topics in meteorology on an individual basis. F,S,SS

497. Internship. 1-4 credits. Prerequisites: Upper division status and consent of instructor. Field experiences in several areas of meteorology including weather modification, radar operations, and cloud physics will be offered as available. S/U grading only. S

499. Topics in Meteorology. 2-4 credits. Consent of instructor. 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. F,S

Aviation

(Avit)


The Department of Aviation offers six 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 Control, Flight Education or Aviation Systems Management, and is granted by the John D. Odegard School of Aerospace Sciences.

The Business degree is fully accredited by the American Assembly of Colleges and Schools of Business (AACSB). The Commercial Aviation and Air Traffic Control majors are fully accredited by the Aviation Accreditation Board International.

A Rotocraft-Helicopter option is available in the Commercial Aviation degree. This option is supported by a full scholarship for both tuition and flying costs, and is available through the U.S. Army Reserve Officer Training Corps (ROTC). Students interested in this Army program should contact the Military Science Department located at the UND Armory Building or the UND Aerospace Student Services office located at Odegard Hall, Room 259.

Cooperative Education and Internship programs are offered by the Department of Aviation, which encourages students to obtain on-the-job experience while continuing their academic education. Opportunities for semester-long cooperative internships are available at major airports, general aviation manufacturers, airlines, and weather modification research operations. Students can apply four elective credits through the cooperative internship program toward their graduation requirements. At the same time, students can obtain valuable on-the-job experience to supplement their formal education.

Career services include the UND Career Planning and Placement Center, the John D. Odegard School of Aerospace Science’s Student Services Center, and an industry and alumni career database, which is maintained by JDOSAS. In addition, representatives from the aviation industry, including major airlines, the Federal Aviation Administration, and Transport Canada come to UND for career fairs and interviewing sessions.

AVIATION DEPARTMENTAL POLICIES

Declaring a Major or Minor

All aviation students are encouraged to declare an aviation major or minor as soon as practicable. In order to declare an aviation major or minor, students must have completed 24 college credits and have earned minimum grade point averages (GPAs), cumulative and institutional, of 2.50 on a 4.00 scale. 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)

Each non-transfer student enrolling in Aviation 101, Survey of Flight, or Aviation 102, Introduction to Aviation, must have a minimum ACT composite score of 21, or a combined SAT score of 990, or must have completed 12 credits of university level coursework with a minimum GPA of 2.50. Each transfer student enrolling in Aviation 101, Survey of Flight, or Aviation 102, Introduction to Aviation, must have a minimum GPA of 2.50. All students must maintain minimum grade point averages (GPAs), cumulative and institutional, of 2.50 in order to enroll in 200-level and above aviation courses. All students, who have enrolled in aviation courses and who fail below the minimum required GPA, are subject to withdrawal from the courses by the Aviation department.

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 as established by 14 CFR Part 141, Appendix B - paragraph 3, Appendix D - paragraph 3, Appendix F - paragraph 3, and Appendix G - para-
graph 3. Failure to meet these attendance requirements will disqualify a student for FAA pilot or flight instructor certification. The following courses are 14 CFR Part 141 approved: Avit 102, 221, 222, 323, 324, 325, 414, and 415.

**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, stated in an applicable course syllabus or Training Course Outline (TCO), will result in an unsatisfactory grade.

**TRANSFER OF COLLEGE CREDIT/ CERTIFICATES AND/OR RATINGS**

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 contained within the aviation major that they are pursuing at the University of North Dakota. All aviation courses subject to 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 process 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, P.O. Box 9007, Grand Forks, North Dakota 58202-9007. Students may e-mail UND Aerospace at: flyund@aero.und.edu. Please refer to http://www.aero.und.edu/student-services/992000flightcoursepolicy.php3 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, which is required under a specific curriculum, will not be granted credit for the corresponding UND course, and the student will be subject to dismissal from the program. The Aviation Department does not allow concurrent enrollment in any flight courses.

**MEDICAL CERTIFICATES**

A current medical certificate is required for all students prior to beginning flight training. The physical examination must be performed by an M.D. who is a designated FAA medical examiner.

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 random drug testing program. This program runs continuously throughout the year for all flight students. Please refer to http://www.aero.und.edu/student-services/medicalcertdrugpro.php3 for more information on medical certificates and the drug 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.

Students enrolling in flight courses are required to deposit money into their flight accounts on a regular basis to cover their flight costs. Depots should be in at least $500 increments. 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.

A Laptop Computer Fee of $400 per semester ($800 per academic year) will be charged to all aviation students. An Altitude Chamber Fee of $150 will be charged to aviation students who use the altitude chamber as part of Aviation 309, Flight Physiology.

An Air Traffic Control program fee or course fee will be charged to aviation students who declare Air Traffic Control as their major or enroll in certain classes.

Additional John D. Odegard School of Aerospace Sciences program fees or course fees may be charged to aviation students enrolled in any of the aviation degree programs.

Students are cautioned to note that costs are subject to change, and that they should consult with their academic advisor, student services advisors, or the applicable program cost sheets for the latest information. Please refer to http://www.aero.und.edu/student-services/projprocost.php3 for more information on program fees.

**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. Forms are available at the beginning of each fall semester from the Aviation Department. Applications for scholarships are due early during the fall semester; therefore, students are encouraged to pick up their applications as soon as they arrive for fall classes.

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 Aviation 101, Survey of Flight, or Aviation 102, Introduction to Aviation, is required.

The Commercial Aviation curriculum is designed for a variety of flight-related careers. Commercial Aviation combines a solid background in aviation with a Certified Flight Instructor Certificate, including appropriate ratings. This major provides a student with the educational foundation necessary for entry-level pilot positions within the aviation industry. A Commercial Pilot Certificate, with instrument and multi-engine ratings, plus a Certified Flight Instructor Certificate, with airplane and instrument ratings, are both required. In addition, Regional Jet (RJ) training or Advanced Transport Category aircraft training is required to graduate with this major.

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 discipline. A Commercial Pilot Certificate, with instrument and multi-engine ratings, plus a Certified Flight Instructor Certificate, with airplane, instrument, and multi-engine ratings, are both required.

The Air Traffic Control curriculum is designed to place students directly into the exciting career field of Air Traffic Control. In addition to the primary curriculum, this program requires a second field of study. Completion of either Aviation 101, Survey of Flight, or Aviation 102, Introduction to Aviation, is required.

The Aviation Systems Management curriculum is designed to be the concluding half of a two-plus-two degree. The objective is to allow students with two-year degrees in aviation maintenance, avionics, electronics, dispatch or other aerospace support services to complete a bachelor’s degree with an emphasis in management. Completion of either Aviation 101, Survey of Flight, or Aviation 102, Introduction to Aviation, is required.

Note: The Aviation faculty members highly recommend that Aviation students use the elective credits to pursue a minor or a second major in another discipline.

College of Business and Public Administration

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 from a 4-year institution) including:

I. General Education Requirements (see University GER 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>
</thead>
<tbody>
<tr>
<td>Accnt 200</td>
<td>Elements of Accounting I</td>
<td>(3)</td>
</tr>
<tr>
<td>Accnt 201</td>
<td>Elements of Accounting II</td>
<td>(3)</td>
</tr>
<tr>
<td>AtSc 110</td>
<td>Metrology I (Lab Science)</td>
<td>(4)</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>
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<td>Econ 202</td>
<td>Principles of Macroeconomics</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 210</td>
<td>Intro to Business and Economic Statistics</td>
<td>(3)</td>
</tr>
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<td>Engl 110</td>
<td>College Composition I</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 120</td>
<td>College Composition II</td>
<td>(3)</td>
</tr>
<tr>
<td>OR</td>
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<td></td>
</tr>
<tr>
<td>Engl 125</td>
<td>Technical and Business Writing</td>
<td>(3)</td>
</tr>
<tr>
<td>Geol 103</td>
<td>Intro to Environmental Issues</td>
<td>(3)</td>
</tr>
<tr>
<td>Isys 117</td>
<td>Personal Productivity with Information Technology</td>
<td>(1)</td>
</tr>
<tr>
<td>Isys 317</td>
<td>Information Systems in Enterprise</td>
<td>(3)</td>
</tr>
<tr>
<td>Lang 101</td>
<td>Foreign Language</td>
<td>(4)</td>
</tr>
<tr>
<td>Lang 102</td>
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<td>(3)</td>
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<td>Pols 115</td>
<td>American Government I</td>
<td>(3)</td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>Electives</td>
<td>(1)</td>
</tr>
</tbody>
</table>

One of the following:

- Anth 171 | Cultural Anthropology | (3) |
- Psyc 111 | Introduction to Psychology | (3) |
- Soc 110 | Introduction to Sociology | (3) |

AVIATION COURSES

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Avit 100</td>
<td>Aviation Orientation</td>
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</tr>
<tr>
<td>Avit 101</td>
<td>Survey of Flight</td>
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<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avit 102</td>
<td>Introduction to Aviation</td>
<td>(5)</td>
</tr>
<tr>
<td>Avit 103</td>
<td>Introduction to Air Traffic Control</td>
<td>(2)</td>
</tr>
<tr>
<td>Avit 208</td>
<td>Aviation Safety</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 250</td>
<td>Human Factors</td>
<td>(2)</td>
</tr>
<tr>
<td>Avit 302</td>
<td>Air Transportation</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 402</td>
<td>Airport Planning and Administration</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 403</td>
<td>Aerospace Law</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 442</td>
<td>Airport Operations and Administration</td>
<td>(3)</td>
</tr>
</tbody>
</table>

One of the following:

- Avit 405 | Airline Operations and Management | (3) |
- Avit 407 | General Aviation Operations and Management | (3) |

ADVANCED BUSINESS COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>Acct 315</td>
<td>Business in the Legal Environment</td>
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</tr>
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<td>Econ 303</td>
<td>Money and Banking</td>
<td>(3)</td>
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<td>Econ 324</td>
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<td>Fin 310</td>
<td>Principles of Finance</td>
<td>(3)</td>
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<td>Isys 305</td>
<td>End-user Applications</td>
<td>(3)</td>
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<tr>
<td>Mgmt 300</td>
<td>Principles of Management</td>
<td>(3)</td>
</tr>
<tr>
<td>Mgmt 301</td>
<td>Operations Management</td>
<td>(3)</td>
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<td>Mgmt 302</td>
<td>Human Resource Management</td>
<td>(3)</td>
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<tr>
<td>Mgmt 310</td>
<td>Organizational Behavior</td>
<td>(3)</td>
</tr>
<tr>
<td>Mgmt 475</td>
<td>Management Strategy</td>
<td>(3)</td>
</tr>
<tr>
<td>Mkt 305</td>
<td>Marketing Foundations</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 404</td>
<td>Urban Politics and Administration</td>
<td>(3)</td>
</tr>
</tbody>
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Plus electives to total 125 credits.

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 from a 4-year institution) including:

I. General Education Requirements (see University GER listing).

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<tr>
<td>Isys 117</td>
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</tr>
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<td>Isys 317</td>
<td>Information Systems in Enterprise</td>
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<tr>
<td>Phys 150/150L</td>
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One of the following:

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- Psyc 111 | Introduction to Psychology | (3) |
- Soc 110 | Introduction to Sociology | (3) |

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<td>Aviation Meteorology I</td>
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<tr>
<td>Avit 100</td>
<td>Aviation Orientation</td>
<td>(1)</td>
</tr>
<tr>
<td>Avit 102</td>
<td>Introduction to Aviation</td>
<td>(5)</td>
</tr>
</tbody>
</table>
Avit 103 ........ Introduction to Air Traffic Control ........................................ (2)
Avit 208 ........ Aviation Safety ................................................................. (3)
Avit 221 ........ Basic Attitude Instrument Flying ........................................ (3)
Avit 222 ........ IFR Regulations and Procedures .......................................... (3)
Avit 250 ........ Human Factors ............................................................... (2)
Avit 302 ........ Air Transportation ............................................................ (3)
Avit 323 ........ Aerodynamics—Airplanes .................................................. (3)
Avit 324 ........ Aircraft Systems ............................................................... (3)
Avit 325 ........ Multi-Engine Systems and Procedures ................................ (2)
Avit 403 ........ Aerospace Law ................................................................. (3)

One of the following:
Avit 402 ........ Airport Planning and Administration .................................. (3)
Avit 405 ........ Airline Operations and Management ................................... (3)
Avit 407 ........ General Aviation Operations and Management ................... (3)

**ADVANCED BUSINESS COURSES**

**Acct 315** .... Business in the Legal Environment ....................................... (3)
**Econ 303** .... Money and Banking ......................................................... (3)
**Fin 310** .... Principles of Finance ............................................................ (3)
**Mgmt 300** .... Principles of Management ................................................ (3)
**Mgmt 301** .... Operations Management .................................................. (3)
**Mgmt 302** .... Human Resource Management .......................................... (3)
**Mgmt 475** .... Strategic Management ...................................................... (3)
**Mrkt 305** .... Marketing Foundations ....................................................... (3)

Plus electives to total 125 credits

**John D. Odegard School of Aerospace Sciences**

**B.S. IN AERONAUTICS WITH A MAJOR IN AIR TRAFFIC CONTROL**

**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. General Education Requirements (see University GER listing).
II. School of Aerospace Sciences Requirements (see College section).
III. The following curriculum:

**GENERAL EDUCATION COURSES**

AtSc 110 ........ Meteorology I ................................................................. (4)
Comm 110 ........ Fundamentals of Public Speaking ...................................... (3)
**Econ 201** .... Principles of Microeconomics .......................................... (3)
Engl 110 ........ College Composition I ..................................................... (3)
**Engl 120** .... College Composition II .................................................... (3)
**Or**
Engl 125 ........ Technical and Business Writing ....................................... (3)
**Lang 101** .... Foreign Language .............................................................. (4)
Lang 102 ........ Foreign Language .............................................................. (4)
**Math 146** .... Applied Calculus I ............................................................. (3)
**Phys 150/150L** Physics for Aerospace Sciences ...................................... (3)
**Arts & Humanities General Education Requirements** ................................ (9)

**AVIATION COURSES**

Avit 100 ........ Aviation Orientation .......................................................... (1)
Avit 101 ........ Survey of Flight ................................................................. (5)
**Or**
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 260 ........ ATC: Tower Operations ..................................................... (4)
Avit 302 ........ Air Transportation ............................................................. (3)
Avit 363 ........ ATC: Radar Operations ..................................................... (4)
Avit 402 ........ Airport Planning and Administration .................................. (3)
Avit 403 ........ Aerospace Law ................................................................. (3)
Avit 464 ........ ATC: Tower Operations III ............................................... (4)
Avit 465 ........ ATC: Tower and Tower Operations IV ................................ (4)
Avit 468 ........ ATC: Non-radar Environment ............................................ (2)

**OTHER REQUIREMENTS**

ISBE 320 ........ Business Communication ............................................... (3)
Comm 212 ........ Interpersonal Communication ........................................ (3)
**Mgmt 305** .... Managerial Concepts .................................................... (3)
**ISYS 117** .... Personal Productivity with Information Technology .............. (1)

Plus electives to total 125 credits*

*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 SYSTEMS MANAGEMENT**

Admission to this program requires the successful completion of an approved two-year program in aviation maintenance, avionics or electronics, dispatcher, simulator repair or other aviation technical support program. Students seeking a profession in Aviation Maintenance are required to have a FAA Mechanic Certificate with airframe and powerplant ratings. Students in avionics/electronics are required to pass the FCC General Class Radio and Telephone license examination. Students in dispatch are required to possess a FAA Dispatcher’s rating.

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. School of Aerospace Sciences Requirements (see College section).
III. The following curriculum:

**GENERAL EDUCATION COURSES**

AtSc 110 ........ Meteorology I ................................................................. (4)
Comm 110 ........ Fundamentals of Public Speaking ...................................... (3)
**Econ 201** .... Principles of Microeconomics .......................................... (3)
**Econ 310** .... Intro to Business & Econ. Statistics .................................... (5)
Engl 110 ........ College Composition I ..................................................... (3)
Engl 120 ........ College Composition II .................................................... (3)
**Or**
Engl 125 ........ Technical and Business Writing ....................................... (3)
Math 146 ........ Applied Calculus I ............................................................. (3)
**Phys 150/150L** Physics for Aerospace Sciences ...................................... (5)
**Arts & Humanities General Education Requirements** ................................ (9)
**Social Science General Education Requirements** .................................. (6)
**BLANKET CREDITS ALLOWED FOR TECHNICAL COURSEWORK.** ............... (40)

**AVIATION REQUIREMENTS**

Avit 100 ........ Aviation Orientation .......................................................... (1)
Avit 101 ........ Survey of Flight ................................................................. (5)
**Or**
Avit 102 ........ Introduction to Aviation .................................................... (5)
Avit 208 ........ Aviation Safety ................................................................. (3)
Avit 302 ........ Air Transportation ............................................................. (3)
Avit 403 ........ Aerospace Law ................................................................. (3)

One of the following:
Avit 402 ........ Airport Planning & Administration ...................................... (3)
Avit 405 ........ Airline Operations & Management ...................................... (3)
Avit 407 ........ General Aviation Operations & Management ...................... (3)

**MANAGEMENT COMPONENT**

Select 15 credits from:

**Acct 200** .... Elements of Accounting I ................................................. (3)
**Acct 315** .... Business Law ................................................................. (3)
**ISBE 320** .... Professional Communication for Business ...................... (3)
**ISYS 117** .... Personal Productivity with Information Technology ............ (1)
**ISYS 317** .... Information Systems in Enterprise .................................... (3)
**ISYS 305** .... End-User Applications .................................................... (3)
**ISYS 308** .... Information Resource Administration ................................ (3)
**ISYS 315** .... Records and Information Management ............................ (3)
**ISYS 420** .... System Analysis and Design ............................................. (3)
**Mgmt 300** .... Principles of Management .............................................. (3)
**Mgmt 301** .... Operations Management ............................................... (3)
**Mgmt 302** .... Human Resource Management ....................................... (3)
**Mgmt 310** .... Organizational Behavior ............................................... (3)
**Mgmt 409** .... Union-Management Relations ........................................ (3)
**Psy 301** .... Industrial & Organizational Psychology* ......................... (3)
**Soc 361** .... Social Psychology** ......................................................... (3)

**Imply that Psy 111 is one of the Social Science GER courses**

**Imply that Soc 110 is one of the Social Science GER courses**

Plus Electives to total 125 credits (to include remaining upper division credits)

**B.S. IN AERONAUTICS WITH A MAJOR IN COMMERCIAL AVIATION**

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

I. General Education Requirements (see University GER listing).
II. School of Aerospace Sciences Requirements (see College section).
III. The following curriculum:
GENERAL EDUCATION COURSES

AtSc 110 .......................... Meteorology I .................................................. (4)
Comm 110 .......................... Fundamentals of Public Speaking .................. (3)
Econ 201 .......................... Principles of Microeconomics ....................... (3)
Engl 110 .......................... College Composition I ................................. (3)
Engl 120 .......................... College Composition II ................................. (3)
OR
Engl 125 .......................... Technical and Business Writing ...................... (3)
Lang 101 .......................... Foreign Language ............................................. (4)
Lang 102 .......................... Foreign Language ............................................. (4)
Math 146 .......................... Applied Calculus I ............................................ (3)
Phys 150/150L ........................ Physics for Aerospace Sciences ............... (5)
Arts and Humanities (other than Language) Electives ............................. (1)
Social Science Electives .......................... ........................................ (6)

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 221 .......................... Basic Attitude Instrument Flying ......................... (3)
Avit 222 .......................... IFR Regulations and Procedures ....................... (3)
Avit 250 .......................... Human Factors .................................................... (2)
Avit 302 .......................... Air Transportation .............................................. (3)
Avit 309 .......................... Flight Physiology ............................................... (3)
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 403 .......................... Aerospace Law .................................................... (3)
Avit 411 .......................... International and Long-Range Navigation ........... (3)
Avit 414 .......................... Certified Flight Instructor ................................. (5)
Avit 415 .......................... Instrument Flight Instructor ............................... (4)
Avit 421 .......................... Advanced Aerodynamics ................................. (3)
Avit 428 .......................... Transport Category Aircraft Systems ............... (4)
Avit 430 .......................... Crew Resource Management ............................ (3)
Avit 480 .......................... Advanced Aircraft Operations ............................ (3)

Two of the following:
Avit 402 .......................... Airport Planning and Administration ................... (3)
Avit 405 .......................... Airline Operations and Management .................... (3)
Avit 407 .......................... General Aviation Operations and Management .... (3)

OTHER REQUIREMENTS

Comm 212 .......................... Interpersonal Communication ....................... (3)
AtSc 231 .......................... Aviation Meteorology .................................... (4)
ISBE 320 .......................... Business Communication ............................... (3)
ISYS 117 .......................... Personal Productivity with Information Technology ...... (1)
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. General Education Requirements (see University GER listing).
II. School of Aerospace Sciences Requirements (see College section).
III. The following curriculum:

GENERAL EDUCATION COURSES

AtSc 110 .......................... Meteorology I ................................................. (4)
Comm 110 .......................... Fundamentals of Public Speaking .................. (3)
Econ 201 .......................... Principles of Microeconomics ....................... (3)
Engl 110 .......................... College Composition I .................................... (3)
Engl 120 .......................... College Composition II .................................. (3)
OR
Engl 125 .......................... Technical and Business Writing ...................... (3)
Lang 101 .......................... Foreign Language ............................................. (4)
Lang 102 .......................... Foreign Language ............................................. (4)
Math 146 .......................... Applied Calculus I ............................................ (3)
Phys 150/150L ........................ Physics for Aerospace Sciences ............... (5)
Arts and Humanities (other than Language) Electives ............................. (1)
Social Science Elective .......................... ........................................ (3)

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 221 .......................... Basic Attitude Instrument Flying ......................... (3)
Avit 222 .......................... IFR Regulations and Procedures ....................... (3)
Avit 302 .......................... Air Transportation .............................................. (3)
Avit 323 .......................... Aerodynamics—Airplanes ............................... (3)
Avit 324 .......................... Aircraft Systems ............................................... (3)
Avit 325 .......................... Multi-Engine Systems and Procedures ............... (2)
Avit 403 .......................... Aviation Law ...................................................... (3)
Avit 405 .......................... Airline Operations and Management ..................... (3)
Avit 407 .......................... General Aviation Operations and Management .... (3)
Avit 414 .......................... Certified Flight Instructor ................................. (5)
Avit 415 .......................... Instrument Flight Instructor ............................... (4)
Avit 416 .......................... Multi-engine Flight Instructor ........................... (2)
Avit 490 .......................... Methods and Materials in Teaching Aviation ........ (2)
Avit 491 .......................... Methods and Materials in Teaching Aviation II .... (2)

OTHER REQUIREMENTS

AtSc 231 .......................... Aviation Meteorology .................................... (4)
Comm 212 .......................... Interpersonal Communication ....................... (3)
Enter 302 .......................... Marketing and Management Concepts for Entrepreneurs .... (3)
ISBE 320 .......................... Business Communication ............................... (3)
Psy 213 .......................... Educational Psychology ..................................... (3)
ISYS 117 .......................... Personal Productivity with Information Technology ...... (1)
Plus electives to total 125 credits

MINORS IN AVIATION

NOTE: Students who are majoring in an aviation field are not eligible to declare either of these minors.

MINOR IN PROFESSIONAL FLIGHT

Required: 30 credits including:
AtSc 110 .......................... Meteorology I .................................................. (4)
AtSc 231 .......................... Aviation Meteorology I .................................... (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)

MINOR IN AVIATION MANAGEMENT

Required: 24 credits including:
AtSc 110 .......................... Meteorology I .................................................. (4)
Avit 101 .......................... Survey of Flight ............................................... (5)
OR
Avit 102 .......................... Introduction to Aviation ....................................... (5)
Avit 208 .......................... Aviation Safety ................................................... (3)
Avit 302 .......................... Air Transportation .............................................. (3)
Avit 402 .......................... Airport Planning and Administration ..................... (3)
Avit 403 .......................... Aviation Law ...................................................... (3)
Avit 405 .......................... Airline Operations and Management ..................... (3)
Avit 407 .......................... General Aviation Operations and Management .... (3)

Courses

All 300 and 400 level courses are restricted to Aviation majors, minors, or to students with instructor/departamental permission. All 400 level courses are restricted to junior/ senior status.

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

101. Survey of Flight. 5 credits. Prerequisite or corequisite: AtSc 110. This course is designed for Airport Management, Air Traffic Control, or Aviation Systems Management majors, and Aviation Management minors, who do not intend to obtain a Private Pilot Certificate. However, there is still a flight component to the course. The flight lessons are designed to provide a broad array of flight experiences and practical knowledge concerning the nature of flight, the operation of airports, and the air traffic control system. Students will meet the aeronautical knowledge requirements of a Private Pilot. Course content includes instruction in aerodynamics, aircraft systems, FAA regulations, U.S. airspace system design and function, weight and balance, aircraft performance, navigation, radio navigation, cross-country planning and navigation, basic flight physiology, and flight safety. Students must complete the appropriate flight lessons to satisfactorily complete the course. Students who desire to obtain a Private Pilot Certificate after completing this course may do so upon taking Aviation 102 and completing the associated flight lessons for that course. This course does not lead to a Private Pilot Certificate. F, S, SS

102. Introduction to Aviation. 5 credits. Prerequisite or corequisite: AtSc 110. 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

103. Introduction to Air Traffic Control. 2 credits. This course covers the following areas that will help the student understand the basics of air traffic control (ATC) in order to make decisions in the future. At the conclusion of the course, the student will be armed with the skills necessary to analyze and question the decisions made by industry leaders. The course will provide students with basic radar training and knowledge of separation requirements. The course also provides instruction in helicopter aerodynamics, flight attitudes, control systems, FAA regulations, U.S. airspace system, weight and balance, helicopter performance, aviation weather, and enroute procedures. The student must complete the appropriate flight lessons in the Private Helicopter course to satisfactorily complete the course. F, S, SS

221. Basic Attitude Instrument Fying. 3 credits. Prerequisite: Avit 102. Corequisite: Avit 208. This course begins with an introduction to basic principles of instrument flight. Students will be introduced to the basic knowledge necessary to navigate a flight under instrument conditions. Terminal and enroute procedures will be studied in detail. The student must complete the appropriate flight lessons to satisfactorily complete the course. F, S, SS

223. Aircraft Systems—Helicopter. 3 credits. Prerequisite: Avit 121. This course provides students with advanced radar training and knowledge of separation requirements. The course 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. F, S, SS

346. Aerodynamics and Performance—Helicopter. 3 credits. Prerequisites: Avit 142, Phys 150/150L. 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. F, S, SS

347. Gas Turbine Engines. 2 credits. Prerequisite: Avit 324. This course will provide an introduction to the design and operation of gas turbine engines. The student must complete the appropriate flight lessons to satisfactorily complete the course. F, S, SS

244. IFR Regulations and Procedures—Helicopter. 3 credits. Prerequisite: Avit 243. This course begins 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. F, S, SS

245. IFR Regulations and Procedures—Helicopter. 3 credits. Prerequisite: Avit 244. 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. On demand.

250. Human Factors. 2 credits. This course introduces students to issues relating to human performance in the complex operational environment. Theory and practical applications of cognitive processing, decision-making, interpersonal interaction and communication will be presented. This course also introduces design elements intended to optimize man-machine interaction. F, S, SS

303. Air Transportation. 3 credits. The objective of this course is to provide the student with a general knowledge of the various elements of air transportation. Students will develop their critical thinking and writing skills, and will learn how to apply these skills to the decisions made by industry leaders. Students will examine how the aviation industry has evolved, and the possible paths it is likely to chart into the future. At the conclusion of the course, the student will be armed with the skills and information necessary to become a more productive participant in the air transportation industry. F, S, SS

309. Flight Physiology. 3 credits. Prerequisite: Avit 250. In this course, human physiological responses to the stresses of flight environment will be examined in depth. Topics include decongestion, hypoxia, spatial disorientation, altered pressure environments, and fatigue. The student will experience different environments during laboratory flights in the UND Aerospace altitude chamber. F, S, SS

322. Radar Approach Control. 3 credits. Prerequisite: Avit 221 or 224. Corequisite: Avit 323. This course provides an in-depth study of radar arrivals/departure procedures. To complete this course, students must, in addition to normal academic requirements, successfully complete required control tower operations through written and performance examinations. An ATC lab is required. F, S, SS

323. Radar Approach Control. 3 credits. Prerequisite: Avit 221 or 224. Corequisite: Avit 323. This course provides an in-depth study of radar arrivals/departure procedures. To complete this course, students must, in addition to normal academic requirements, successfully complete required control tower operations through written and performance examinations. An ATC lab is required. F, S, SS

385. Flight Physiology. 3 credits. Prerequisite: Avit 250. In this course, human physiological responses to the stresses of flight environment will be examined in depth.
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. F, SS

399. Special Aerospace Topics. 1-4 credits. F, S

402. Airport Planning and Administration. 3 credits. Prerequisite: Avit 302. 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 in its role 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 air- ports within the United States. F, S, SS

403. Aerospace Law. 3 credits. Prerequisite: Avit 302. This course is designed to introduce the student to the United States legal system and the development of aviation law. The course will cover a broad range of topics including FAA enforcement actions and their effect on aircraft operations, products liability law, criminal law, insurance law, airline law, and a discussion of legal issues facing airports. F, S, SS

405. Airline Operations and Management. 3 credits. Prerequisite: Avit 302. This course will cover 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 emphasis on ethical decision making. F, S, SS

407. General Aviation Operations and Management. 3 credits. Prerequisite: Avit 302. 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 FARs 91 and 135 will be studied. Aircraft and equipment evaluations will be conducted. F, S, SS

411. International and Long Range Navigation. 3 credits. Prerequisites: Avit 325 and Math 146. 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). F,S

414. CFI Certification. 5 credits. Prerequisite: Avit 325. Provides the student with a detailed study of the fundamentals of teaching in a multi-engine airplane. The course is divided into two major sections: fundamentals of teaching and learning, including effective teaching methods, learning process, consideration of flight training syllabi, effective evaluations, and flight instructor responsibilities; the second section is concerned with the analysis of the flight maneuvers involved with Private Pilot, Commercial Pilot and Flight Instructor Certificates. The course will also provide practical teaching experiences. The student must complete the associated flight lessons in the CFI Flight Course to satisfactorily complete the course. F, S, SS

419. Flight Instructor. 4 credits. Prerequisite: Avit 414. 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, fundamentals of flight and navigation as a part of the student’s development of practical teaching experience. The student must complete the associated flight lessons in the Instrument Flight Instructor course to satisfactorily complete the course. F, S, SS

416. Multi-engine Flight Instructor. 2 credits. Prerequisite: Avit 415. 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 multi-engine operations, single-engine operations and procedures, flight instructor responsibilities, flight safety concerns and instrument flight maneuvers in multi-engine air- planes. The student must complete the associated flight lessons in the Multi-engine CFI course to satisfactorily complete the course. No concurrent enrollment allowed with other aviation flight courses. F, S, SS

421. Advanced Aerodynamics. 3 credits. Prerequisite: Avit 325 or consent of the instructor. Beginning with a brief review of low speed aerodynamics, the course pro- vides a study of the terminology and aerodynamics fundamentals associated with transonic and supersonic flight. F, S, SS

426. Transport Category Aircraft Systems. 4 credits. Prerequisite: Avit 325 or consent of the instructor. This course will provide an in-depth study of the complex systems of today’s air transport jet aircraft with an emphasis on Regional Jet aircraft. It provides a review of all primary systems, to include both normal and abnormal opera- tions. The course also provides an introduction to the instructors background for Regional Jet simulator training to be presented in a later course. F, S, SS

429. Turboprop Operations. 4 credits. Prerequisite: Avit 325 or consent of the instructor. This course will provide an introduction to turboprop aircraft systems and procedures. Emphasis will be placed on the systems and operational procedures for a specific model of turboprop aircraft utilized by the student. Course presentation will be similar to air carrier initial training. The course will provide a synopsis of the turboprop industry including any recent developments. F, S

430. Crew Resource Management. 3 credits. Prerequisite: Avit 250 and 325. This course will provide an in-depth study of Crew Resource Management which in- volves having a thorough understanding of crew communications, teamwork, leader- ship, “followship,” decision-making, and situational awareness. In addition, the student will have the ability to identify available means in order to ensure a safe and efficient flight. This course will also examine the benefits of diversity, and the role diversity plays in the modern aerospace industry. F, S, SS

442. Airport Operations and Administration. 3 credits. Prerequisite: Avit 402. This course will provide advanced instruction on the operation and management of commercial service airports of all sizes. The content focuses on the practical application of airport manager skills and includes educational material on the function of operating airports. This program stresses the airport manager’s role in handling managerial issues, interpersonal relationships with tenants, public officials, and patrons through the hiring of individual writing and public speaking skills. F

464. ATC: Tower Operations III. 4 credits. Prerequisite: Avit 362 and Avit 363. This course teaches advanced ATC control operations and procedures. Students will learn about and practice Land and Hold Short Operations (LAHSO), below Basic VFR minima operations, IFR operations, nighttime operations, non-radar departure proce- dures, 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. F, S, SS

465. ATC: Radar and Tower Operations IV. 4 credits. Prerequisite: Avit 464. 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 Regu- lations separation standards, airspace utility, aircraft types and characteristics, funda- mентals 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. F, S, SS

468. ATC: Non-Radar Procedures. 2 credits. Comprehensive knowledge of all ATC non-radar procedures, airspace utilization, flight plans, general control, board management, initial departure separation, IFR clearances to departing aircraft, communication requirements, and separation standards are stressed. Scenarios will in- clude both the enroute and terminal structures. To complete this course, the student shall be required to demonstrate and apply the skills and knowledge required to successfully complete a non-radar performance exercise with no guidance.

480. Advanced Aircraft Operations. 3 credits. Prerequisites: Avit 415, 421 and 428. The topics of study include high speed and high altitude aerodynamics, physi- ological 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. F, S, SS

481. Airline Transport Pilot Certification Lab. 2 credits. Prerequisites: Avit 308 and 325. Provides a comprehensive background of flight experience in two engine aircraft and the proficiency level of the FAA Airline Transport Pilot oral and practical flight examinations. Students enrolling in the course must hold a valid FAA Commercial Pilot Certificate with an airplane category and multi-engine class rating; in addition, they must hold a valid Instrument/Airplane Rating. Flight instruction in the course includes basic instrument flying, concentrated practice on instrument approach procedures, emergency procedures, and cross-country flying. S/U grading only. On Demand.

490. Methods and Materials in Teaching Aviation. 2 credits. Prerequisite: Avit 414. This course will acquaint the student with resources and software utilized in class- room teaching specific to aviation. Topics covered include use of presentation software, writing a syllabus, composing lesson plans, delivering a lecture/presentation and writ- ing tests. Discussion of teaching methods and critiques of peers will also be included. F

491. Methods and Materials in Teaching Aviation II. 2 credits. Prerequisite: Avit 414. This course will be a continuation of the work started in Aviation 490. It provides 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 and evaluation of student performance. Participation in the tutoring lab will be a requirement for completion of this course. S

492. Internship. 2 credits. Prerequisites: will vary depending on the area of the internship. 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 manage- ment, airport planning, fixed-base operation management and 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. F, S, SS

493. Readings in Aviation. 1-3 credits. Prerequisite: senior standing. Repeat- able to 8 credits. The course is designed for seminar and project assignments. Both the seminar and project assignments are to be concerned with in-depth studies of aviation related subjects including airport traffic counts, student flight activities, airport manage- ment problems, and statistical reports. F, S, SS
Banking and Financial Economics  
(See Economics listing)

Biochemistry and Molecular Biology  
(BMB)

Detke, Foster, Gao, Homandberg (Chair), Lambeth, Milavetz, Shabb, Singh, Sukalski, Vaughan and Wu

Courses

301. Biochemistry Lecture. 3 credits. Three lectures per week. Prerequisites: Chemistry 240 or 342 or equivalent. Topics including enzymology; biochemical mechanisms; metabolism and its regulation; nucleic acid metabolism; recombinant DNA technology; structure and function of macromolecules. S

401. Biochemistry of Proteins and Information Flow. 3 credits. Prerequisite: BMB 301. This course will build upon the overview of biochemistry and molecular biology as presented in BMB 301. Lectures will emphasize advanced topics in protein structure and function, enzymology, and the expression and transmission of genetic information. An independent project in proteomics or computational biochemistry will be required. F

403. Advanced Biochemistry Laboratory. 2 credits. Prerequisites: BMB 401 (may be taken the same semester) and permission of instructor. Students will demonstrate competency in understanding and performing physical and molecular techniques commonly used in biomedical research. F

494. Directed Studies. 1 to 4 credits, repeatable to 12 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. Open to all students, with consent of the instructor required. F, S, SS

Biology  
(Biol)

Carmichael, Crossley, Darland, Goodwin, Kelsch, Kupchella, La Duke, Meberg, Mehl, Newman, Potvin, Pyle, Ralph, Rhen, Schlosser (Chair), Sheridan, Simmons, Sweitzer, Tkach and Vaughan

The Department of Biology offers a B.S. in Biology, B.S. in Biology with Pre-Health Science Emphasis, and a B.S. in Fisheries and Wildlife Biology. In addition, there are three options associated with the B.S. in Biology degree: General Biology; Molecular, Cellular, and Developmental Biology; and Ecology and Evolutionary Biology. Specific department requirements for the degrees and options are listed below.

FACILITIES

The Department of Biology is housed in Starcher Hall. In addition to classrooms, three 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, a darkroom, and isotope and tissue culture facilities. The Department also maintains two natural areas (virgin prairie and wooded stream valley) and a biology core molecular facility for teaching and research.

INDEPENDENT STUDY

Well qualified majors are urged to participate in independent studies, honors work, or undergraduate research. Normally, studies of this nature 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

B.S. WITH MAJOR IN BIOLOGY

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. Minimum 39 total credits.) The following courses must be taken as part of the General Education Requirement:

   English 110 College Composition I (3)
   Comm 110 Fundamentals of Public Speaking (3)

II. 43 major hours including:

A. Core requirements for all options (23 hours):

   Biol 150 & Biol 151 General Biology I & II (6)
   Biol 150L & 151L General Biology Lab I & II (2)
   Biol 312 Evolution (3)
   Biol 315 Genetics (3)
   Biol 332 Ecology (3)
   Biol 341 Cell Biology (3)
   Biol 480 Senior Capstone Seminar** (3)

**Students who take Biol 111 and Biol 111L (Concepts of Biology and Lab) prior to becoming a Biology major are required to take Biol 150 and Biol 150L to complete the General Biology sequence.

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.

1. 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):

1. Required courses (8 credit hours):

   Biol 341L Cell Biology Lab (1)
   Biol 410 Molecular Biology Techniques (4)
   Biol 378 Developmental Biology (5)

   Totals: 22
3. Biology electives (7 additional credit hours)

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.

Option 3. Ecology and Evolutionary Biology

This program is designed for students interested in ecology, evolutionary biology, and related areas. Students will explore animal behavior, biodiversity, evolutionary history and interactions of organisms and their environments. The coursework outlined here will familiarize students with the conceptual framework of ecology and evolutionary biology and provide necessary analytical skills and familiarity with groups of living organisms. The program will help prepare students for careers in ecological, evolutionary, and related fields, including those in conservation, the environment, and graduate study. Students should consult with their adviser to develop an appropriate course of study.

Advanced requirements (minimum 20 credit hours):

1. Required courses (4-5 credit hours):
   - Biol 332L .... Ecology Lab ................................................................. (1)
   - Biol 376 ..... Animal Biology & Biol 376L Animal Biology Lab ...... (4)
   - or Biol 350 ..... Plant Biology ............................................................... (3)

2. Option courses (minimum 5 credit hours from the list below):
   - Biol 333 .... Population Biology ...................................................... (3)
   - Biol 338 ...... Animal Behavior .......................................................... (2)
   - Biol 433 ..... Aquatic Ecology ............................................................. (3)
   - Biol 439 ..... Conservation Biology .................................................. (3)

3. Biology electives (minimum 8 additional credit hours)

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.

Although not required, all students in the Ecology and Evolutionary Biology emphasis are strongly encouraged to take both plant (Biol 350) and animal (Biol 376) biology.

Depending on the student’s area of interest, any, or several of the following courses that were not already identified are potentially recommended: Biol 336 (Systematic Botany), Biol 363 (Entomology), Biol 364, 364L (Parasitology and lab), Biol 425 (Ichthyology), Biol 427 (Ornithology), Biol 428 (Mammalogy).

Biol 410 (Molecular Techniques) is strongly recommended as one elective course for students interested in Ecology and Evolutionary Biology.

4. Physical Sciences requirement (3-4 credit hours taken from the list below):
   - Geog 134, 134L. Introduction to Global Climate and Lab ............... (4)
   - Geog 474, 474L. Cartography and Computer Assisted Mapping & lab ...(3)
   - Geol 101, 101L. Physical Geology with lab ...................................... (4)
   - Geol 102, 102L. The Earth Through Time and Lab ............................ (4)

III. Cognate requirements in other departments for all three options (30-33 credit hours):

A. Mathematics (3-4 credit hours):
   - Math 146 ....... Applied Calculus ......................................................... (3)
   - or Math 166 ......... Calculus II .............................................................. (4)

Pre-requisites for either course are the responsibility of the student.

B. Chemistry (16-18 credit hours):
   - Chem 121/121L. General Chemistry I & Lab .................................... (4)
   - Chem 222/222L. General Chemistry II & Lab .................................. (4)
   - Chem 240 and BMB 301 Survey of Organic Chemistry & Biochemistry Lecture ..... (8)
   - or Chem 341, 341L, 342, 342L Organic Chemistry I and II with labs ................................ (10)

C. Physical sciences (8 credit hours):
   - Phys 211/212 .... College Physics I and II ......................................... (8)
   - or Phys 251/252 .... University Physics I and II ................................. (8)

D. Other - Statistical Methods and Data Interpretation (3 credit hours from the list below):
   - Biol 470 ......... Biometry ................................................................. (3)
   - Soc 320 ......... Sociological Research Methods ...................................... (3)
   - Math 321 ......... Applied Statistical Methods ....................................... (3)

Note: Biol 470 (Biometry) is required in the Ecology and Evolutionary Biology option.

Teacher Certification

Students seeking secondary teacher certification in Biology must complete the Department of Teaching and Learning requirements in Secondary Education (see Secondary Education listing).

These students must complete the B.S. with Major in Biology or 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)
   - BMB 302 ......... General Microbiology ............................................. (4)

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

   - Geol 101, 101L. Physical Geology with lab .................................. (4)
   - Geog 134, 134L. Introduction to Global Climate with lab .............. (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 Chem 240 Organic Chemistry (5) and BMB Biochemistry Lecture (3) option.

Formal admission to Teacher Education is required and is normally sought while enrolled in T&L 325 (see Department of Teaching and Learning). 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 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. General Education Requirements (see University GER listing. Minimum 39 total credits).

   The following courses must be taken as part of the General Education requirement:

   - Engl 110 ------- College Composition I ........................................... (3)
   - Comm 110 ------ Fundamentals of Public Speaking ........................... (3)

II. 43 major hours including:

   A. Core Requirements (23 credit hours; all courses below):

      - Biol 150/151 .... General Biology I & II* ...................................... (6)
      - Biol 150L/151L General Biology Lab I & II .................................... (2)
      - Biol 312 .......... Evolution ............................................................ (3)
      - Biol 315 ......... Genetics .............................................................. (3)
      - Biol 332 ......... Ecology ............................................................... (3)
      - Biol 341 .......... Cell Biology .......................................................... (3)
      - Biol 480 ...... Senior Capstone Seminar** .................................... (3)
      - TOTAL ................................................................................. (23)

*Students who take Biol 111 and Biol 111L (Concepts of Biology and Lab) prior to becoming a Biology major are required to take Biol 150 and Biol 150L to complete the General Biology sequence.

**Appropriate Senior Honors Thesis (Biol 489) credits can be substituted for Biol 480 if approved by both the Biology faculty adviser and the Biology Department Chairperson.

We strongly advise mastery of materials in all core courses except Biol 480 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 43 hour major.

Up to two life-sciences related courses from other departments at the University of North Dakota may be counted toward the 43 hour major, provided they do not overlap extensively with subject matter included in Biology Department courses also being used for credit.
At least four upper division Biology courses with laboratories must be included in the 43 hour major. Two upper division life sciences-related laboratory course from other departments at the University of North Dakota 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.

A Biol 494 Directed Studies or Biol 492 Research Experience may be counted as one upper division laboratory requirement with appropriate documentation of the laboratory experience and approval by the supervising faculty member, the faculty adviser, and the Biology Department Chairperson.

Students may include no more than 10 combined credit hours from Biol 494 (Directed Studies), Biol 492 (Research), and Biol 489 (Senior Honors) towards the total 43 credit hours required for this Biology Major.

B. Advanced requirements (minimum 20 credit hours):

1. Upper-level courses (minimum 12 credit hours taken from the list below):
   - Biol 341L . . . . Cell Biology Lab ................................................................. (1)
   - Biol 364 ...... Parasitology ................................................................. (2)
   - Biol 364L . . . . Parasitology Lab ........................................................ (2)
   - Biol 367 ...... Cytology ................................................................ (3)
   - Biol 369 ...... Histology ................................................................ (2)
   - Biol 369L . . . . Histology Lab .......................................................... (2)
   - Biol 420 ...... Neuroscience ............................................................... (3)
   - Biol 442 ...... Physiology of Organs and Systems ................................ (3)
   - Biol 442L ... Physiology of Organs and Systems Lab ........................ (1)
   - MBIO 328 ... Introduction to Immunology ........................................... (3)
   - Biol 376 ...... Animal Biology .......................................................... (3)
   - Biol 376L . . . . Animal Biology Lab ................................................ (1)
   - Biol 378 ...... Developmental Biology .................................................. (3)

2. Biology electives (8 additional credit hours)
   - 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):

A. Mathematics (3-4 credit hours)
   - Math 146 ...... Applied Calculus ......................................................... (3)
   - or
   - Math 166 ...... Calculus II ................................................................... (4)

Pre-requisites for either course are the responsibility of the student.

B. Chemistry (16-18 credit hours):
   - Chem 121/121L . . . General Chemistry I & Lab ...................................... (4)
   - Chem 122/122L . . . General Chemistry II & Lab .................................... (4)
   - Chem 240 and MBMB 301
     - Survey of Organic Chemistry &Biochemistry Lecture .................. (8)
   - or
   - Chem 341/341L, 342/342L
     - Organic Chemistry I and II with labs ............................................. (10)

Note: the sequence of Chem 341 and Chem 342 AND MBMB 301 is highly recommended for pre-medical students because some medical schools require or prefer this combination.

C. Physical sciences (8 credit hours):
   - Phys 212/212 . . . College Physics I and II ........................................... (8)
   - or
   - Phys 251/252 . . . University Physics I and II ...................................... (8)

D. Other - Statistical Methods and Data Interpretation (3 credit hours from the list below):
   - Biol 470 . . . . Biometry .................................................................. (3)
   - Soc 320 . . . . Sociological Research Methods ..................................... (3)
   - Math 321 . . . . Applied Statistical Methods ........................................... (3)

B.S. 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. General Education Requirements (see University GER listing).

II. The Following Curricular:
   - 52.54 major hours, including:
     - Biol 150, 151 . . . General Biology I & II .......................................... (6)
     - Biol 150L, 151L . . . General Biology I & II Lab ................................ (2)
     - Biol 315 . . . . Genetics .................................................................. (3)
     - Biol 332, 332L . . . General Ecology and Lab ..................................... (4)

     - Biol 338 . . . . Animal Behavior ..................................................... (2)
     - Biol 431 . . . . Wildlife Management................................................ (4)
     - Biol 438 . . . . Fisheries Management ............................................... (3)
     - Biol 442 . . . . Physiology of Organs and Systems ............................ (4)
     - Biol 470 . . . . Biometry ................................................................ (3)

2 hours from:
   - Biol 338L . . . . Animal Behavior Lab ............................................. (2)
   - Biol 371 . . . . Anatomy and Adapations Lab .................................... (2)

3 hours from:
   - Biol 312 . . . . Evolution ................................................................ (3)
   - Biol 333 . . . . Population Biology ................................................... (3)
   - Biol 370 . . . . Vertebrate Zoology ..................................................... (3)

4 hours from:
   - Biol 363 . . . . Entomology ............................................................... (4)
   - Biol 364, 364L . . . Parasitology and Lab ........................................... (4)

3 hours from:
   - Biol 365 . . . . Ichthyology ............................................................... (3)
   - Biol 433 . . . . Aquatic Ecology .......................................................... (3)

Wildlife Option
   - Biol 427 . . . . Ornithology ................................................................. (3)
   - Biol 428 . . . . Mammalogy ................................................................. (3)

- Biological Station or Field Work ......................................................... (No Credit)

One summer of field experience or study at a recognized biological station is required.

III. Required in other departments:

Chem 121/121L . . . General Chemistry I and Lab .................................... (4)
Chem 122/122L . . . General Chemistry II and Lab ................................ (4)
Chem 240/240L . . . Organic Chemistry .................................................. (5)
Comm 110 . . . . Fundamentals of Public Speaking .................................. (3)

4 hours from:
   - Phys 101/101L . . . Introduction to Geology ........................................ (4)
   - Phys 211 . . . . College Physics I ....................................................... (4)

3-4 hours of math from either Math 146 (Applied Calculus) or Math 166 (Calculus II). The prerequisites for each of these courses are the responsibility of the student.

MINOR IN BIOLOGY (minimum 20 hours required)

Required 20 hours, including:
   - Biol 150/151 . . . General Biology I & II ........................................... (6)
   - Biol 150L/151L . General Biology I & II Lab ..................................... (2)
   - Biol 315 . . . . Genetics .................................................................. (3)

   or
   - Biol 341 . . . . Cell Biology ............................................................... (3)

   AND

   - Biol 312 . . . . Evolution ................................................................. (3)
   - Biol 332 . . . . Ecology ................................................................. (3)

Electives ......................................................................................... (6)

All other 300 or 400 level biology courses, including those listed above that have not already been taken to meet the minor requirements, will count toward the 20 hour minor.

No more than one UND life science course from outside the Biology Department may be counted toward completion of the minor.

Courses

Note: all biology courses that count as upper-division labs are marked with asterisk.*

111. Concepts of Biology. 3 credits. Intended for non-science majors seeking general knowledge and cultural appreciation of contemporary biology. Does not serve as a prerequisite for 150 or any other biology course. Students may not normally receive credit for both 111 and 150-151. F, S

111L. Concepts of Biology Laboratory. 1 credit. Prerequisite or co-requisite: Biol 111. A basic biology laboratory to complement Biol 111. F, S

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

150, 151. General Biology I & II. 6 credits. Basic concepts of biology with emphasis on life’s diversity, processes, and man’s place in nature. Broadly designed to satisfy the needs of those pursuing biological and preprofessional curricula. F, S

150L, 151L. Introduction to Biology Laboratory. 2 credits. Prerequisite or co-requisite: Biol 150, 151. A contemporary biology laboratory to complement Biol 150, 151.

240. Wildlife Conservation. 2 credits. Basic principles and philosophies of wildlife conservation in North America. F

Advanced Courses

Biology 150, 150L, 151 and 151L or equivalent are prerequisites for all 300 and 400 level courses listed below.

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. S

315. Genetics. 3 credits. An introduction to genetics, with emphasis on classical genetic analysis and the biochemistry of gene transmission, expression and regulation. F

315R. Genetics Recitation. 1 credit. Prerequisites: Biol 150, 150L, 151 and 151L. Corequisite: Biol 315. 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. F

332. General Ecology. 3 credits. An introduction to ecology. Covers the relationships of individuals, populations, communities and ecosystems to their biotic and abiotic environments. F

332L. General Ecology Laboratory, 1 credit. Prerequisite or co-requisite: Biol 332. Field projects and laboratory exercises to complement Biol 332 F

335. Population Biology. 3 credits. Principles of population genetics, population ecology, and evolution in plants and animals. S

336. Systematic Botany. 4 credits. Structure and classification of vascular plants with emphasis on field studies. F

338. Animal Behavior. 2 credits. Studies in animal social behavior. The influences of environmental factors on behavior is emphasized. S

338L. Animal Behavior Laboratory. 2 credits. Prerequisite or co-requisite: Biol 338. Laboratory studies of animal behavior including a student research project using live animals. S

341. Cell Biology. 3 credits. Prerequisite or Corequisite: Chem 122. 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. S

341L. Cell Biology Laboratory. 1 credit. Prerequisite or co-requisite: Biol 341. Chem 121 and 122. Recommended: Organic Chemistry. Laboratory investigation utilizing techniques to study life at the cellular level including chemical composition and characterization, enzyme kinetics, metabolism and microscopy. S

350. Plant Biology. 3 credits. Prerequisite: Biol 150/151 or permission of instructor. Structure and function of plants at the cellular, tissue, and whole plant levels. Topics also include ecological adaptations and plant-derived products. S/2

363. Entomology. 4 credits. Structure, functions, life history, classification, habits and distribution of insects. F

364. Parasitology. 2 credits. Classification, structure and function, and life cycles of parasites having importance to human, wildlife and veterinary health. F

364L. Parasitology Laboratory. 2 credits. Prerequisite or co-requisite: Biol 364. A basic parasitology laboratory to complement Biol 364. F

367. Cytology. 3 credits. Prerequisite: Biol 315. A study of the structure and organization of the cell with a special emphasis on the genetic regulation of the cell division cycle, the genetic basis of cancer, and the role of the genes in the immune system. F

369. Histology. 2 credits. Microscopical anatomy of vertebrate tissues and organs, with emphasis on man and other mammals. S

369L. Histology Laboratory. 2 credits. Prerequisite or co-requisite: Biol 369. A basic histology laboratory to complement Biol 369. S

370. Vertebrate Zoology. 3 credits. Vertebrate evolution and natural history stressing the relationships of anatomy, ecology, physiology and behavior to one another. F

371. Anatomy and Adaptations Laboratory. 2 credits. Prerequisite or co-requisite: Biol 371. 370. Dissections of representatives of various vertebrate classes; examination of morphological adaptations. F

376. Animal Biology. 3 credits. Prerequisites: Biol 150 and 151. Evolution, morpho-anatomy, development, reproduction and other aspects of the natural history of invertebrate and vertebrate animals. S

376L. Animal Biology Laboratory. 1 credit. Prerequisites: Biol 150, 150L, 151 and 151L. Corequisite: Biol 376. Observation of live or fixed animals belonging to various invertebrate and vertebrate groups with emphasis on their adaptations to environments/life styles. Laboratory projects will include some of the classical and modern techniques used in systematic studies. S

378. Developmental Biology. 3 credits. Prerequisites: Biol 150, 151L, 150L, 151L, 315 and 341. An overview of general stages and mechanisms of development, experimental approaches used to study developmental processes, and genetic and environmental influences that govern development. F

397. Cooperative Education. 1-8 credits, repeatable to 24 credits. Prerequisites: Sophomore standing and approval of the department chair and acceptance by a supervisory faculty member. 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. S/2 grading only. F, S, SS

410. Molecular Biology Techniques. 4 credits. Applications of DNA and RNA analysis and recombinant DNA technologies, emphasizing practical experience in the laboratory. This class will meet twice a week for 50 minutes in the classroom, and students will be expected to work approximately 4-6 hours a week in the lab during open lab times. F

420. Neurosciences. 3 credits. Prerequisites: Biol 150/150L and junior standing. 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. F

425. Ichthyology. 3 credits. Structure and function, anatomy, physiology, behavior, classification, distribution and ecological aspects of fishes. F

427. Ornithology. 3 credits. Classification, identification, morphology, distribution, ecology and life history of birds. S

428. Mammalogy. 3 credits. Classification, identification, morphology, distribution, ecology and life history of mammals. F/2

431. Wildlife Management. 4 credits. Theory and methods of management of game populations. F

433. Aquatic Ecology. 3 credits. Analysis of the relationships between organisms and their physical, chemical and biological environments in freshwater ecosystems. S/2

434. Large Mammal Ecology. 3 credits. Prerequisite: Biol 332. A course covering details of the population ecology, specialized management approaches and techniques, and conservation of large-bodied mammals in North America and worldwide. F/2

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. S

439. Conservation Biology. 3 credits. A course that integrates information from environmental policy, ecology, genetics, biogeography, economics and ethics towards preventing extinction and maintaining biological diversity. S/2

442. Physiology of Organs and Systems. 3 credits. Study of the physiology of organs and organ systems in vertebrates. S

442L. Physiology of Organs and Systems Laboratory. 1 credit. Prerequisite or co-requisite: Biol 442. A physiology laboratory to complement Biol 442. S

450. Molecular Genetics. 2 credits. Prerequisites: Biol 315. 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. S

470. Biometry. 3 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. S

477. Concepts of Biology. 2 credits. Prerequisite: Senior status in biological science or consent of instructor. Consideration of the unifying concepts in biology. On demand.

480. Senior Capstone Seminar. 3 credits. Prerequisite: Senior status in biological science or permission of instructor. Key aspects of scientific enquiry 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. F, S

489. Senior Honors Thesis. 1 to 15 credits; total not to exceed 15. Prerequisite: consent of the Department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F, S

491. Seminar. 1 credit. Prerequisite: Major or minor in biology. Discussion of selected topics in advanced biology, a different topic each semester. F, S

492. Research. 1 to 4 credits. Open to qualified majors. Prerequisite: Consent of instructor. Research conducted under the supervision of a faculty member. F, S

494. Directed Studies. 1 to 4 credits. May be repeated up to a total of 9 credits. Designed to meet the needs of individual students in the areas of faculty specialization. Consent of instructor. F, S

499. Special Topics. 1-4 credits. Prerequisites: Biol 150, Biol 151, or consent of instructor. Important and current topics in biology not covered by other courses. Repeatable when topics vary. On demand.

Business Administration (BAdm)

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 hours, including:

1. Completion of 9 hours from the following:
   - Acct 380* ................................ International Accounting (3)
   - Econ 338* ................................ International Economics (3)
   - Econ 380* ................................ Global Economic Development (3)
   - Econ 438* ................................ International Money and Finance (3)
   - Fin 430 ........................................ International Financial Management (3)
   - Mgmt 420 ..................................... Multinational Management (3)
   - Mkt 325 .................................... International Marketing (3)

2. Completion of 9 hours from the following:
   - Anth 171 .................................... Cultural Anthropology (3)

   S

   F

   S/2
MINOR IN CHINESE STUDIES: CULTURE AND BUSINESS

The minor in Chinese Studies: Culture and Business is offered through the College of Business and Public Administration and is open to all students across campus. The Chinese Studies minor provides a formal, structured, multidisciplinary approach to the study of modern China, its history, language, customs, culture and economy. The program targets students from all majors for in-depth examination of a region of growing global importance with special emphasis on the practical development of cross-cultural business skills. The minor requires a minimum of 23 credits in three different categories: Chinese language, area studies and business. It also requires fieldwork or an internship experience in China.

Program Requirements: a minimum of 23 credits distributed between Parts A, B and C as follows:

**Part A: Language** (8 credits)
- Chin 101 .... First Year Chinese I ................................................. (4)
- Chin 102 .... First Year Chinese II ................................................. (4)

**Part B: Area Studies** (6 credits selected from the following courses)
- Chin 305 .... Chinese Culture through Films .................................... (3)
- Chin 306 .... Introduction to Chinese Calligraphy ............................ (3)
- Hist 362 .... Modern Chinese History ............................................. (3)
- Rel 315 .... Religion and Philosophy in China and Tibet ................. (3)
- Geog 463 .... Regional Geography: China ...................................... (3)
- Engl 299 .... ST: Chinese Literature in Translation ........................... (3)

**Part C: Business Studies** (9 credits)
- BAdm 316 .... Introduction to Business in China .............................. (3)
- BAdm 318 .... China Then and Now (summer in China) ..................... (3)
- BAdm 319 .... Business Fieldwork in Shanghai (summer in China) .... (3)

**Courses**

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.

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.

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.

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.

Business Economics

(See Economics listing)
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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChE 102</td>
<td>Introduction to Chemical Engineering</td>
<td>(2)</td>
</tr>
<tr>
<td>Chem 221/221L.#</td>
<td>Fundamentals of Chemistry I* Analysis</td>
<td>(3/1)</td>
</tr>
<tr>
<td>Chem 222/222L.#</td>
<td>Fundamentals of Chemistry II* Concepts*</td>
<td>(3/1)</td>
</tr>
<tr>
<td>Engl 110</td>
<td>College Composition I*</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 165</td>
<td>Calculus I*</td>
<td>(4)</td>
</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>Arts /Humanities GER</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Social Science GER</td>
<td>(3)</td>
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</tbody>
</table>

| Sophomore Year | | |
| ChE 201       | Stoichiometry* | (3) |
| ChE 232       | Chemical Engineering Laboratory I | (2) |
| Chem 341/341L | Organic Chemistry I and Lab | (4/1) |
| Econ 201      | Principles of Microeconomics | (3) |
| Engl 125      | Introduction to Technical and Business Writing* | (3) |
| Engr 201      | Statics | (3) |
| Math 265      | Calculus III* | (4) |
| Math 266      | Elem. Differential Equations | (3) |
| Phys 252      | University Physics II* | (4) |
| ChE 206       | Unit Operations in Chemical Engineering | (3) |
| Advanced Chemical Science elective | (3) |

| Junior Year | | |
| ChE 301      | Transport Phenomena | (4) |
| ChE 305      | Separations | (3) |
| ChE 331/332  | Chemical Engineering Laboratory II and III | (2) |
| ChE 333      | Basic Experimental Strategies | (2) |
| Chem 465     | Physical Chemistry II | (3) |
| EE 206       | Electrical Engineering Fundamentals | (3) |
| ChE 303      | Chemical Engineering Thermodynamics | (4) |
| Engr 460     | Engineering Science elective | (3) |
| ChE 421      | Chemical Engineering Reactor Design | (3) |
| ChE 431      | Chemical Engineering Lab IV | (3) |
| Engr 408     | Chemical Engineering Economy | (3) |
| ChE 411      | Chemical Engineering Plant Design I | (3) |
| ChE 412      | Chemical Engineering Plant Design II | (5) |
| ChE 421      | Chemical Engineering Reactor Design | (3) |
| ChE 431      | Chemical Engineering Lab IV | (3) |
| Cultural Elective | (3) |
| Social Science (GER) | (3) |
| Technical Elective I | (3) |
| Technical Elective II | (3) |

* Must be completed with a grade of C or better prior to enrollment in Junior-level ChE courses.

1 Eng 120 — College Composition II may be substituted.

In addition to the normal transfer credit stipulations, transfer students and Distance Engineering Degree Program (DEDP) students in Chemical Engineering must complete the following courses from the UND Chemical Engineering Department: ChE 206, Unit Operations in Chemical Engineering; ChE 305, Separations; ChE 411, Chemical Engineering Plant Design I; ChE 412, Chemical Engineering Plant Design II; ChE 421, Chemical Engineering Reactor Design; and ChE 431, Chemical Engineering Laboratory IV.

**Courses**

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

201. Stoichiometry, 3 credits. Prerequisite: Chem 122 or 222. Introductory principles of stoichiometry with emphasis directed to material and energy balances involved in chemical processes. F

206. Unit Operations in Chemical Engineering, 3 credits. Prerequisites: ChE 201. Application of the principles of momentum and heat transfer from a unit operations perspective. S

232. Chemical Engineering Laboratory I, 2 credits. Prerequisite: ChE 201 or concurrent enrollment. The use and application of apparatus to measure the physical and chemical properties involved in chemical process material and energy balances. S

301. Introduction to Transport Phenomena, 4 credits. Prerequisite: Math 266 or concurrent enrollment, ChE 201 and Physics 252. An analytical study of the transport of momentum, energy and mass; derivation and utilization of the differential equations of change. F

303. Chemical Engineering Thermodynamics, 4 credits. Prerequisites: ChE 201* and Chem 465. Thermodynamics applied to chemical engineering with emphasis on computational work, including thermodynamic laws, chemical equilibrium and pressure-volume-temperature relationships. F

305. Separations, 3 credits. Prerequisite: ChE 201* and prerequisite or corequisite ChE 206. Theory and application of rate-based and equilibrium-staged separations. S

331. Chemical Engineering Laboratory II, 2 credits. Prerequisites: ChE 201 and ChE 206. Experiments illustrating physico-chemical principles and the application of fluid flow and heat transfer theory. F

332. Chemical Engineering Laboratory III, 3 credits. Prerequisites: ChE 331 and ChE 333 or concurrent enrollment in Chem 465. Experiments reinforcing physico-chemical principles, unit operations, and separations. Pre-design labs are also introduced. S

333. Basic Experimental Strategies, 1 credit. Corequisite: ChE 331. Basic experimental strategies for the empirical study of relationships between variables. Analysis of resulting data to find significance of effects. F

340. The Role of Engineers and Applied Scientists in a Global Society, 3 credits. This course analyzes the important impact of engineering and applied science on society. It 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. S

397. Cooperative Education, 1-8 credits repeatable to 24. Prerequisite: Admission to the chemical engineering degree program. A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department and employer. S/U grading only. F,SS

404. Air Emissions: Regulation and Control, 3 credits. This course is designed to enable engineers to understand natural and anthropogenic sources of air pollution, their impact on health and the environment, and learn ways to minimize air emissions by application of control practices. F

Besides the technical education embodied in the program, there is a strong required general education component including a cultural elective. 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 20-25 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 School of Engineering and Mines section for additional details. For even more complete information, see Graduate School section.
Chemistry

Chemistry

Abrahamson, H., Abrahamson, J., Banerjee, Delbridge, Hoffmann (Chair), Koziak, Kubatova, Novikov, Pierce, Smoliakova, Stahl, Thomasson and Zhao

The Chemistry Department of the University has been approved by the Committee on Professional Training of the American Chemical Society. 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 upon graduation and certification by the Chairman of the Department, receive a special certificate from the Society. Certified graduates are eligible to become Members of the American Chemical Society; other chemistry graduates may become Associate Members and Members after three years of professional experience in chemistry.

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 or who wish to prepare 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. Some students may be interested in the five-year, combined M.S./B.S. that is offered. For more detailed information, see the Graduate School Bulletin.

College of Arts and Sciences

B.S. 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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

Major Requirements—49 hours of Chemistry including:

FRESHMAN YEAR

Fall Spring

Chem 221, 221L... Fundamentals of Chemistry: Concepts & Lab ................. (4) (4)
Chem 222, 222L... Fundamentals of Chemistry: Analysis & Lab .................. (4)
Chem 116 ............ Introduction to Organic and Biochemistry .................. (3)
Engl 110 ............. College Composition I .................................. (3)
Engl 125 ............ Technical and Business Writing .......................... (3)
Math 165 ............ Calculus I .................................................. (4)
Math 166 ............ Calculus II .................................................. (4)
General Education Electives ...................................... (5) (1)
Total Hours ......................................................... 16 15

SOPHOMORE YEAR

Chem 341, 341L... Organic Chemistry I & Lab ........................ (5)
Chem 342, 342L... Organic Chemistry II & Lab ........................(5)
Phys 251, 251L...
Phys 252, 252L... University Physics I & II & Lab ...................... (4) (4)
Math 265 ............ Calculus III ............................................ (4)
General Education & Other Electives .......................... (7)
Total Hours ......................................................... 16 16

JUNIOR YEAR

Chem 464, 465 ... Physical Chemistry I, II ................................. (3) (3)
Chem 455 ............ Spectroscopy and Structure ...................... (3)
Chem 461, 461L... Instrumental Analysis & Lab ..................... (5)
Level II Language ................................................. (4) (4)
Electives ......... ......................................................... (6) (3)
Total Hours ......................................................... 16 15

SENIOR YEAR

Chem 462 ............ Physical Chem Laboratory ........................ (3)
Chem 454 ............ Inorganic Chemistry ............................... (3)
Chem 429 ............ Inorganic Chemistry Laboratory ............... (1)
Chem 488 ............ Undergraduate Seminar .......................... (1)
Minimum of 6 credits of advanced chemistry electives which must include at least 3 credits of coursework
Chem-463, Chem-492, any Chem 500 course or
BMB 301) ............................................................... (3) (3)
Electives ......................................................... (5) (9)
Total Hours ......................................................... 14 16

1 With permission of the adviser, a student may substitute English 120 if English 125 is not available.
2 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.
3 Suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Language, Computer Science, Chemical Engineering, Business Management, and Speech.
4 Math 461 is offered in alternating springs so may be taken in the senior year.
5 Math 429 is offered in alternating springs so may be taken in the junior year.
6 Graduate level courses in Chemistry may be taken as electives.

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. General Education Requirements (see University GER listing)

II. The Following Curriculum:

Major Requirements—36 hours of Chemistry including:

Option A. Physical Science Emphasis

FRESHMAN YEAR

Fall Spring

Chem 121, 121L... General Chemistry I & Lab ........................ (4) (4)
Chem 122, 122L... General Chemistry II & Lab ....................... (4)
Engl 110 ............. College Composition I .............................. (3)
Engl 125 ............ Technical and Business Writing ................. (3)
Math 165 ............ Calculus I ............................................. (4)
Math 166 ............ Calculus II ............................................ (4)
General Education Electives ........................................ (5) (4)
Total Hours ......................................................... 16 15

91
### SOPHOMORE YEAR
- **Chem 333, 333L Intro Environmental, Clinical & Forensic Chemical Analysis & Lab** (4)
- **Chem 341, 341L Organic Chemistry I & Lab** (5)
- **Chem 342, 342L Organic Chemistry II & Lab** (5)
- **Phys 251, 251L** (4)
- **Math 265 Calculus III** (4)
- **Humanities or Social Science Electives** (6)
- **Total Hours** (17 15)

OR

- **Chem 222, 222L Fundamentals of Chemistry: Analysis and Lab** (4)
- **Chem 341, 341L Organic Chemistry & Lab** (5)
- **Chem 342, 342L Organic Chemistry II & Lab** (4)
- **Phys 251, 251L** (4)
- **Phys 252, 252L University Physics I & II & Lab** (4)
- **Math 265 Calculus III** (4)
- **General Education Electives** (3 3)
- **Total Hours** (16 16)

### JUNIOR YEAR
- **Chem 464, 465 Physical Chemistry I 1** (3 3)
- **Chem 461, 461L Instrumental Analysis** (5)
- **Electives** (9 4)
- **Total Hours** (16 16)

### SENIOR YEAR
- **Chem 462 Physical Chem Laboratory** (3)
- **Electives** (12 15)
- **Total Hours** (15 15)

1. With permission of the adviser, a student may substitute English 120 if English 125 is not available.
2. 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.
3. To fulfill the University Graduation Requirements a minimum of 6 credits hours of Arts and Humanities (in addition to languages) and 9 credit hours in Social Sciences must be taken.
4. Either Chem 333, 333L (Fall) or Chem 222, 222L (Spring) should be taken, not both. Which one is taken affects the number of hours available for electives in a given semester. Chem 461 is offered only in alternate Spring semesters.
5. Suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech.
6. Graduate level courses in Chemistry may be taken as electives.

**Option B. Biochemistry Emphasis**

### FRESHMAN YEAR
- **Chem 221, 221L Fund. of Chem: Concepts & Lab** (4)
- **Chem 222, 222L Fund. of Chem: Analysis & Lab** (4)
- **Engl 110 Composition I** (3)
- **Engl 125 Technical and Business Writing** (3)
- **Math 146 Applied Calculus I** (3)
- **Biol 150, 150L General Biology I & Lab** (4)
- **Biol 151, 151L General Biology II & Lab** (4)
- **Electives (GERs)** (5 2)
- **Total Hours** (16 16)

### SOPHOMORE YEAR
- **Chem 333 Introductory Environmental & Clin Forensic Chemical Analysis** (3)
- **Chem 341, 341L Organic Chemistry I & Lab** (5)
- **Chem 342, 342L Organic Chemistry II & Lab** (5)
- **Phys 211, 211L College Physics I & Lab** (4)
- **Phys 212, 212L College Physics II & Lab** (4)
- **General Education Electives** (3 7)
- **Total Hours** (15 16)

### JUNIOR YEAR
- **Chem 466 Survey of Physical Chemistry** (4)
- **BMB 301 Biochemistry Lecture** (3)
- **Electives** (4 4)
- **Total Hours** (16 16)

### SENIOR YEAR
- **Chem 467 Survey of Physical Chem Laboratory** (2)
- **BMB 401 The Biochemistry of Proteins and Information Flow** (3)
- **BMB 403 Advanced Biochemistry Laboratory** (2)
- **Electives** (8 15)
- **Total Hours** (15 15)

### 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/Minor in Chemistry with laboratory, a semester of analytical chemistry with laboratory, and one year of organic with laboratory. Chem 240 and Biochem 301 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 beyond the chemistry courses required for the major.

**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 requirements in Secondary Education on page 155. Students seeking certification must also complete these additional courses:

- **BMB 301 Biochemistry Lecture** (3)
- **Biol 150, 151 General Biology I & II** (6)
- **Biol 150L, 151L General Biology Lab I & II** (2)

**Electives from:**
- **GeoL 101, 101L Physical Geology** (4)
- **Geog 121, 121L Physical Geography** (4)

Chemistry majors seeking secondary certification must have an adviser both in the Chemistry Department and in the Department of Teaching and Learning. Formal admission to Teacher Education is normally sought while enrolled in T&L 325 (see Department of Teaching and Learning listing).

### Clinical Laboratory Science

The Clinical Laboratory Science (CLS) program at UND offers a “4+1” curriculum that allows a student to receive a certificate from the CLS 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 Clinical Laboratory Scientist. The CLS 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 CLS program for more details.

### Courses

**110. Survey of Chemistry.** 4 credits. Prerequisites: none. 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

**115. Introductory Chemistry.** 3 credits. Corequisite: Chem 115L. Measurement, ionic and covalent compounds, chemical calculations, states of matter; energy, solutions, reactions, chemical bonding, F.S

**115L. Introductory Chemistry Laboratory.** 1 credit. Corequisite: Chem 115. Laboratory to accompany Chem 115. F.S

**116. Introduction to Organic and Biochemistry.** 3 credits. Prerequisite: Chem 115 or 121. Corequisite: Chem 116L. Does not satisfy the prerequisite for any advanced chemistry course. A second semester of general chemistry with emphasis on organic and biochemistry. Includes alkane, alkenes, alkyne, aromatics, alcohol, phenols, ethers, aldehydes, ketones, carboxylic acids, esters, amines, amides, carbohydrates, lipids, amino acids, proteins, and nucleic acids. Especially useful for students who wish to include organic and biochemistry in the first year. Required of students in the B.S. in Chemistry program. F.S

**116L. Introduction to Organic and Biochemistry Laboratory.** 1 credit. Corequisite: Chem 116L. Laboratory to accompany Chem 116. Required of all chemistry majors. F.S;SS

**121. General Chemistry I.** 3 credits. Prerequisite: Math 102. Corequisites: Chem 121L, Math 103 or an appropriate score on the Placement Testing Program (PTP). Open to all students; no high school credit in chemistry required. Elementary principles and theories of chemistry; matter, measurement, atoms, ions, molecules, reactions, chemical calculations, thermochemistry, bonding, molecular geometry, periodicity, gases. Required of all chemistry majors. F.S;SS

**121L. General Chemistry I Laboratory.** 1 credit. Corequisite: Chem 121L. Laboratory to accompany Chem 121. Required of all chemistry majors. F.S;SS

**122. General Chemistry II.** 3 credits. Prerequisite: Chem 121. Corequisite: Chem 122L. Elementary principles and theories of chemistry; Intermolecular forces, liquids,
solids, kinetics, equilibria, acids and bases. Solution of chemistry, precipitation, thermodynamics. Electrochemistry. Required of all chemistry majors. E,S,SS

122L. General Chemistry II Laboratory. 1 credit. Prerequisite: Chem 121L. Corequisite: Chem 122. Laboratory to accompany Chem 122. Required of all chemistry majors. F,S,SS

221L. Fundamentals of Chemistry - Concepts. 3 credits. Prerequisites: high school chemistry and Math 103 or appropriate placement score. Corequisite: Chem 221L. Atomic and molecular structure, stoichiometry, states of matter, thermodynamics, periodicity and descriptive inorganic chemistry. F

221L. Fundamentals of Chemistry Laboratory. 1 credit. Prerequisite: high school chemistry and Math 103 or appropriate placement score. Corequisite: Chem 221L. F

222L. Fundamentals of Chemistry - Analysis. 3 credits. Prerequisites: Chem 221L and 221L. Corequisite: Chem 222L. Properties of solutions, physical and chemical equilibria, chemical kinetics, applications to traditional methods of chemical analysis. S

222L. Quantitative Chemical Analysis Laboratory. 1 credit. Prerequisite: Chem 221L. Corequisite: Chem 222. Laboratory to accompany Chem 222. S

Survey of Organic Chemistry Laboratory. 1 credit. Prerequisite: Chem 122L. Corequisite: Chem 240. Laboratory to accompany Chem 240. F,S

333. Introductory Environmental, Clinical and Forensic Chemical Analysis. 3 credits. Prerequisites: Chem 122 and Chem 122L or written permission of the instructor. Corequisite: Chem 333L. Principles of quantitative and qualitative chemical analysis as applied to environmental, clinical and forensic science are covered. F, SS

333L. Introductory Environmental, Clinical and Forensic Chemical Analysis Laboratory. 1 credit. Prerequisites: Chem 122 and Chem 122L or written permission of the instructor. Corequisite: Chem 333. Laboratory to accompany Chem 333. Principles of quantitative and qualitative chemical analysis as applied to environmental, clinical and forensic science are covered. F,S

341L. Organic Chemistry I Laboratory. 1 credit. Prerequisite: Chem 122L. Corequisite: Chem 341. Laboratory to accompany Chem 341. Required for chemistry majors. F,S


340L. Organic Chemistry II Laboratory. 1 credit. Prerequisites: Chem 122 and Chem 122L or written permission of the instructor. Corequisite: Chem 342, General Chemistry II with a grade of C or better. Corequisite: Chem 341L. Designed for science and pre-professional students. Required for chemistry majors. Structure and bonding, nomenclature, stereochemistry, functional groups, spectroscopy (NMR, IR, MS) for structure determination. S,F

341L. Organic Chemistry I Laboratory. 1 credit. Prerequisite: Chem 122L. Corequisite: Chem 341. Laboratory to accompany Chem 341. Required for chemistry majors. F,S


342L. Organic Chemistry II Laboratory. 1 credit. Prerequisite: Chem 341L. Corequisite: Chem 342. Required for all chemistry majors. Laboratory to accompany Chem 342. F,S

93L. Special Problems in Chemistry. 1 to 3 credits. Prerequisite: consent of instructor. Total credits not to exceed 3. An opportunity for students to work on research problems under close faculty guidance. S/U grading only. F,S

97L. Cooperative Education. 8 credits. May be repeated for a maximum of 12 credits. Prerequisites: year of freshman chemistry with laboratory and either one of the following course sequences: Chem 341, 342, SU grading. F

429. Inorganic Chemistry Laboratory. 1 credit. Corequisite: Chem 454. 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. F,S

431. Selected Topics in Chemistry. 1-5 credits, repeatable with different topics. On demand.

454. Inorganic Chemistry II. 3 credits. Prerequisite: Chem 465 or 466. Chemistry of inorganic compounds in terms of modern theories and concepts. F

455. Spectroscopy and Structure. 3 credits. Prerequisite: Chem 342 or Chem 466. Corequisite: Chem 464. Students may satisfy the Chem 464 prerequisite by a Chem 466 prerequisite instead. Applications of spectroscopic techniques to the determination of molecular structure. F

461L. Instrumental Analysis. 5 credits. Prerequisite: Chem 464 and 330 or 333. Recommended as an elective for chemical engineers interested in using instrumental methods for chemical analysis. Applications of contemporary instrumental techniques to problems of quantitative and qualitative analysis. S,F

461L. Instrumental Analysis Laboratory. 2 credits. Corequisite: Chem 461. Laboratory experiences utilizing modern instrumental methods to address problems of quantitative and qualitative analysis. S,F

462L. Physical Chemistry Laboratory. 3 credits. Prerequisites: Chem 464 and 465. 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 analytical methods. F

463. Advanced Synthesis Laboratory. 3 credits. Prerequisites: Chem 462 or 467 and 455. Advanced synthetic, separatory and characterization methods commonly used in modern laboratory practice will be emphasized. S


465. Physical Chemistry II. 3 credits. Prerequisites: Chem 341, Math 265, Phys 252. The use of energy concepts in studying and understanding the nature of matter, equilibria, reactivity, kinetics, criteria for reactions. F

488. Undergraduate Seminar. 1 credit. Corequisites: Chem 492 or 463. Required for B.S. in Chemistry. Introduction to current research in chemistry and to professional chemistry seminar preparation. S

Senior Honors Thesis. 1-8 credits, repeatable to 9. Supervised independent study culminating in a thesis. F

492. Senior Research. 2-6 credits. Prerequisite: Chem 342. Corequisite: Chem 462 or 467. May be repeated up to 6 credits. Total credits not to exceed 6. F, S, SS

Civil Engineering (CIEN)

Gullicks, Jerath, Lim, Moretti (Chair), Mamaghani and Suleiman

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 apply 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.

See Combined Degree Program under the School of Engineering and Mines section for additional details.

The following are the educational objectives (EO) of the civil engineering program:

EO1 Graduates have the knowledge and skills required to analyze and solve problems related to the field of civil engineering.

EO2 Graduates practice civil engineering in a wide range of professional settings including consulting firms, government agencies and industries.

EO3 Graduates work mainly in the areas of engineering design and development, construction, research, technical sales, and environmental regulation.

EO4 Most graduates continue learning by participating in job related training activities, pursuing a professional engineering license, and/or attending graduate school.

EO5 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 the Accreditation Board for Engineering and Technology (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 CIEN 300-level or higher engineering coursework, including the CIEN 482 and 483 Civil Engineering Design sequence.

**B.S. IN CIVIL ENGINEERING**

Required 135 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:

**Freshman Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Chem 121, 121L</td>
<td>General Chemistry I/Laboratory ......</td>
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<tr>
<td>Chem 122, 122L</td>
<td>General Chemistry II/Laboratory ......</td>
<td>(4)</td>
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<tr>
<td>Biol 150, 150L</td>
<td>General Biology I/Laboratory ......</td>
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<tr>
<td>Engl 110</td>
<td>College Composition I ..................</td>
<td>(3)</td>
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<tr>
<td>Engl 125</td>
<td>Technical &amp; Business Writing ..........</td>
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<tr>
<td>OR</td>
<td><em>Engl 120</em></td>
<td>College Composition II ...............</td>
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<tr>
<td>CIEN 101</td>
<td>Introduction to Civil Engineering ....</td>
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<tr>
<td>Engr 101</td>
<td>Graphical Communication ...............</td>
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<tr>
<td>Engr 200</td>
<td>Computer Applications in Engineering ................................</td>
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<tr>
<td>Math 165, 166</td>
<td>Calculus I &amp; II .......................</td>
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**Sophomore Year**

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<tbody>
<tr>
<td>CIEN 201</td>
<td>Introduction to AutoCAD for Civil Engineers ................................</td>
<td>(1)</td>
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<tr>
<td>CIEN 313</td>
<td>General Surveying Laboratory ..........</td>
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<tr>
<td>CIEN 313L</td>
<td>General Surveying Laboratory ..........</td>
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<tr>
<td>Econ 210</td>
<td>Introduction to Business and Economic Statistics ............................</td>
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<tr>
<td>Engr 201</td>
<td>Statics ........................................</td>
<td>(3)</td>
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<tr>
<td>Engr 203</td>
<td>Mechanics of Materials ................</td>
<td>(3)</td>
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<tr>
<td>Math 265</td>
<td>Calculus III ............................</td>
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<tr>
<td>Math 266</td>
<td>Elementary Differential Equations ....</td>
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<td>Phys 251, 251L</td>
<td>University Physics I/Laboratory ..</td>
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<td>Phys 252, 252L</td>
<td>University Physics II/Laboratory ....</td>
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<tr>
<td>GeoE 203</td>
<td>Geology for Engineers .................</td>
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<tr>
<td>OR</td>
<td><em>Geol 101</em>*</td>
<td>Introduction to Geology ..............</td>
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<tr>
<td>Social Science ................................</td>
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**Junior Year**

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<tbody>
<tr>
<td>CIEN 301</td>
<td>Civil Engineering Lab I ................</td>
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<tr>
<td>CIEN 302</td>
<td>Civil Engineering Lab II ..............</td>
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<tr>
<td>CIEN 306</td>
<td>Fluid Mechanics ........................</td>
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<tr>
<td>CIEN 351</td>
<td>Structural Mechanics ...................</td>
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<tr>
<td>CIEN 412</td>
<td>Soil Mechanics ..........................</td>
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<tr>
<td>Engr 202</td>
<td>Dynamics ...................................</td>
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<tr>
<td>CIEN 423</td>
<td>Hydraulic Engineering .................</td>
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<td>CIEN 431</td>
<td>Environmental Engineering I ..........</td>
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<td>CIEN 451</td>
<td>Steel Design ................................</td>
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<td>EE 206</td>
<td>Circuit Analysis ........................</td>
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<td>OR</td>
<td>JT 211</td>
<td>Electric Circuits and Devices ..........</td>
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<tr>
<td>Phil 370</td>
<td>Ethics in Engineering ..................</td>
<td>(3)</td>
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<tr>
<td>OR</td>
<td>ME 370</td>
<td>Engineering Disasters and Ethics ......</td>
<td>(3)</td>
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<tr>
<td>ChE 340</td>
<td>The Role of Engineers and Applied Scientists in a Global Society ........</td>
<td>(3)</td>
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<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics ..........</td>
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**Senior Year**

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<td>CIEN 414</td>
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<td>CIEN 416</td>
<td>Transportation Engineering ............</td>
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<tr>
<td>CIEN 432</td>
<td>Environmental Engineering II ..........</td>
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<tr>
<td>CIEN 444</td>
<td>Contracts and Specifications ..........</td>
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<tr>
<td>CIEN 453</td>
<td>Reinforced Concrete .....................</td>
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<tr>
<td>CIEN 421</td>
<td>Hydrology ..................................</td>
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<td>Engr 460</td>
<td>Engineering Economy ....................</td>
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<td>CIEN 482</td>
<td>Civil Engineering Design ..............</td>
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<td>Social Science ...........................</td>
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* Students are encouraged to take Engl 125.
** Students are encouraged to take GeoE 203.

**Courses**

101. Introduction to Civil Engineering. 1 credit. This course will be a series of lectures and discussions concerning the practice of civil engineering. Topics covered include the scope of civil engineering practice, professional practice issues, engineering design, ethics, communication skills, teamwork skills, and career planning. S

201. Introduction to AutoCAD for Civil Engineers. 1 credit. Prerequisite: Engr 203. The course introduces the basic functions of the AutoCAD software. The course uses a combined lecture and laboratory format to teach the fundamental AutoCAD drawing techniques. Students will have access to AutoCAD software through the civil engineering computer laboratory. S

301. Civil Engineering Lab I. 2 credits. Prerequisites: Engr 203 and Engl 110. Corequisites: Econ 210 and CIEN 412. 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. F

302. Civil Engineering Lab II. 2 credits. Prerequisites: Engr 203 and Engl 110. Corequisites: Econ 210, CIEN 431 and CIEN 423. 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, COD, 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. S

306. Fluid Mechanics. 3 credits. Prerequisites: Phys 251 and Math 265. Fluid properties, fluid statics and dynamics, transport theory and transport anisotropies, conservation of mass, energy, and momentum; dimensional analysis; boundary layer concepts; pipe flows; compressible flow; open channel flow. F/S

313. General Surveying. 2 credits. Prerequisite: Math 165. Corequisite: On-campus students must take CIEN 313L along with this class. 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. F

331L. General Surveying Laboratory. 1 credit. Prerequisite: DEDP students must have completed CIEN 313. Corequisite: On-campus students must be enrolled in CIEN 313. 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. F (on campus), SS (DEDP students)

351. Structural Mechanics. 4 credits. Prerequisite: Engr 203. 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. F

397. Cooperative Education. 1-3 credits repeatable to 24. Prerequisite: Admission to civil engineering degree program or consent of advisor. A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department and employer. F,S,SS

412. Soil Mechanics. 2 credits. Prerequisite: Engr 203. 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. F

414. Foundation Engineering. 3 credits. Prerequisite: CIEN 412. 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. F

416. Transportation Engineering. 3 credits. Prerequisite: CIEN 412. Transportation systems; transportation planning and future developments; design and analysis of transportation facilities including traffic operations, highway geometry, and pavement. S

421. Hydrology. 3 credits. Prerequisite: CIEN 306. Course topics include measurement, interpretation, analysis and application of hydrologic data; precipitation, evaporation and transpiration; run-off hydrographs; routing methods; groundwater; and snow hydrology. Computer applications. S

423. Hydraulic Engineering. 2 credits. Prerequisite: CIEN 306. Fluid statics and dynamics; open channel flow; transitions and controls; hydraulic structures; hydraulic machinery; hydraulic power conversion; and hydraulic modeling. S

431. Environmental Engineering I. 3 credits. Prerequisite: CIEN 306. Environmental quality, water quality modeling, water & wastewater treatment systems, sludge processing, solid wastes, hazardous wastes, environmental lab S

432. Environmental Engineering II. 3 credits. Prerequisite: CIEN 306. Water distribution networks, mass curve analysis, wastewater collection systems, pumping systems for water and wastewater, system design project, computer-assisted design, confined spaces. F

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University of North Dakota
Clinical Laboratory Science

434. Environmental Engineering Laboratory. 4 credits. Physical, chemical and biological methods used in environmental engineering, water chemistry, instrumental methods, lab tours. On demand.


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

451. Steel Design. 3 credits. Prerequisite: CIEN 351. Selection of sections, bolted and welded connections, trusses, bearings, light gauge structural members, fatigue of structural members and introduction to plastic design. S

453. Reinforced Concrete. 3 credits. Prerequisite: CIEN 351. Materials and specifications, axially and eccentrically loaded columns, strength beam theory, shear stresses, bond and development length, serviceability, and one-way slabs. F

482. Civil Engineering Design. 2 credits. Prerequisites: Two of these four: CIEN 351, 412, 423, and 431. Corequisite: CIEN 432. This is a comprehensive design course which integrates the engineering design and engineering science components of previous and ongoing coursework into a major design experience, incorporating engineering standards and realistic constraints. Term paper on current engineering issues. Team design projects in the areas of environmental, geotechnical, structures, water resources, etc. Group preliminary design reports and individual presentations. F

483. Civil Engineering Design. 2 credits. Prerequisite: CIEN 482. This is the second of a two-course sequence in Civil Engineering design and is a continuation of CIEN 482. Coursework addresses design and professional practice issues. Student teams perform detailed design analysis, prepare a final design report and give an oral presentation on their final design. S

490. Special Topics. 1 to 3 credits. Prerequisite: Departmental approval. Investigation of special topics dictated by student and faculty interests. FS

Clinical Laboratory Science (CLS)

Coleman, Paur (Program Director), Peterson, Porter, Schill and Sens (Chair)

http://medicine.nodak.edu/cls

The University of North Dakota has offered a degree in clinical laboratory science since 1949. The Clinical Laboratory Science (CLS) program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), which is located at 8410 West Bryn Mawr, Suite 670, Chicago, IL 60631.

Clinical Laboratory Scientists, sometimes referred to as Medical Technologists, 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 severe shortage of clinical 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 science, management or education.

School of Medicine and Health Sciences

B.S. in Clinical Laboratory Science

The CLS degree includes two years of pre-professional (freshman and sophomore) education followed by two years of professional (junior and senior) coursework. Application for advancement to the professional education component is made during the second semester of the sophomore year. Applicants to the professional program must have a cumulative GPA of at least 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 Pathology 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 CLS courses, a specific CLS tuition is assessed.

Required 130 credits (36 of which must be numbered 300 or above, and 60 credits of which must be from a four-year institution) including:

I. General Education Requirements (see University GER listing).

II. Curriculum:

Freshman Year

FIRST SEMESTER
Engl 110 ................... College Composition I .............................................. (3)
Bio 150 & 150L ....... General Biology I and Laboratory ............................... (4)
Chem 121 & 121L .... General Chemistry I and Laboratory ......................... (4)
Math 103 or 104 ....... College Algebra or Finite Math ................................. (3)

SECOND SEMESTER
Boil 151 ................. General Biology II .................................................. (3)
Comm 110 ............... Fundamentals of Public Speaking .............................. (3)
Chem 122 & 122L .... General Chemistry II and Laboratory ....................... (4)
Engl 120 or 123 ....... College Composition II or Technical and Business Writing (3)

Sophomore Year

FIRST SEMESTER
MBio 202 ............... Introductory Medical Microbiology Lecture .................. (3)
Anat 204 ............... Anatomy for Paramedical Personnel .......................... (3)
CIS 101 ............... Orientation to Medical Laboratory Sciences ................ (2)
Comm 212 ............. Interpersonal Communications .................................. (3)
Social Science ........ Introduction to Psychology (recommended) .................. (3)
Humanities Elective (World Culture) .................................................. (3)

SECOND SEMESTER
CLS 234 ............... Human Parasitology ............................................... (2)
CLS 234L .......... Human Parasitology Lab ............................................. (1)
CLS 238 ............... Computer & Statistical Applications in CLS ............... (2)
Social Science ....... Principles of Microeconomics (recommended) .......... (3)
Humanities Elective ................................................................. (3)

Professional Curriculum Year 1

Junior Year

FIRST SEMESTER
CLS 301 ............... Immunology ............................................................... (2)
CLS 325 ............... Hematology ................................................................. (3)
CLS 325L .......... Hematology Laboratory ................................................. (2)
CLS 336 ............... Laboratory Calculations .............................................. (1)
CLS 393 ............... Immunohemotology/Immunology Laboratory ............. (2)
PPT 301 ............... Human Physiology .................................................. (4)
Humanities Elective ................................................................. (3)

SECOND SEMESTER
BMB 303 ............... Biochemistry Laboratory ....................................... (3)
Mgmt 300 ............. Prin. of Management ............................................... (3)

Mgmt 305 ............. Managerial Concepts .......................................... (3)

Professional Curriculum Year 2

Senior Year

SUMMER SESSION
CLS 470 ............... Clinical Immunohematology I ................................ (1)
CLS 471 ............... Clinical Chemistry Theory, Prin., Procedures, & Correlations (2)
CLS 472 ............... Clinical Laboratory I ............................................... (1)
CLS 473 ............... Clinical Hemostasis .................................................... (2)
CLS 474 ............... Clinical Microscopy & Urimanalysis ........................... (2)
CLS 477 ............... Clinical Immunohematology Theory ....................... (1)
CLS 478 ............... Clinical Microbiology Theory & Laboratory .............. (2)
CLS 482 ............... Clinical Hematology I ............................................... (2)

FIRST SEMESTER
CLS 475 ............... Clinical Body Fluids ................................................ (1)
CLS 480 ............... Clinical Immunohematology II .................................. (2)
CLS 481 ............... Clinical Chemistry I ................................................... (3)
CLS 483 ............... Clinical Laboratory II ............................................... (1)
CLS 484 ............... Clinical Microbiology I .............................................. (2)
CLS 485 ............... Clinical Laboratory III ............................................. (1)
CLS 486 ............... Clinical Immunology ............................................... (1)
CLS 487 ............... Medical Mycology ................................................... (1)

SECOND SEMESTER
CLS 490 ............. Fin. & Qual. Management of the CL. Laboratory .......... (3)
CLS 491 ............... Clinical Chemistry II ................................................ (1)
4 + 1 B.S. in Clinical Laboratory Science

The CLS program offers a 4 + 1 curriculum. A student is eligible for this program if they have earned a B.S. or B.A. degree and have completed the following prerequisite courses:

- General Chemistry .................................................................................................................. (8)
- Organic Chemistry ................................................................................................................ (3)
- Biochemistry ......................................................................................................................... (3)
- General Biology .................................................................................................................... (6)
- Microbiology ........................................................................................................................ (3)
- Anatomy ................................................................................................................................ (3)
- Physiology .............................................................................................................................. (3)
- CLS 234 Human Parasitology* ............................................................................................ (2)
- CLS 301 Immunology* ......................................................................................................... (2)
- CLS 325 Hematology* ......................................................................................................... (3)
- CLS 325L Hematology Laboratory** ................................................................................... (2)

* Available online
** 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. The applicant must have a cumulative GPA of at least 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 Pathology Professional and Academic Standards Committee. When a student is registered in 300 and 400 level CLS courses, a specific CLS tuition is assessed.

Upon successful completion of the 4 + 1 program of study, the student will earn a B.S. in Clinical Laboratory Science degree from UND and will be eligible to take a national certification examination and become a certified Clinical Laboratory Scientist and/or Medical Technologist.

Professional Curriculum Year 2

SUMMER SESSION

- CLS 470 ............... Clinical Immunohematology I ......................................................... (1)
- CLS 471 ............... Clinical Chemistry, Theory, Principles, Procedures, & Correlations (2)
- CLS 472 ............... Clinical Laboratory I ................................................................. (1)
- CLS 473 ............... Clinical Hemostasis ................................................................. (2)
- CLS 474 ............... Clinical Microscopy & Urinalysis .............................................. (2)
- CLS 477 ............... Clinical Immunohematology Theory ........................................ (1)
- CLS 478 ............... Clinical Microbiology Theory & Laboratory ............................ (2)
- CLS 482 ............... Clinical Hematology I ............................................................... (2)

FIRST SEMESTER

- CLS 475 ............... Clinical Body Fluids ................................................................. (1)
- CLS 480 ............... Clinical Immunohematology II ............................................... (2)
- CLS 481 ............... Clinical Chemistry I ................................................................. (3)
- CLS 483 ............... Clinical Laboratory II ............................................................... (1)
- CLS 484 ............... Clinical Microbiology I ............................................................ (2)
- CLS 485 ............... Clinical Laboratory III .............................................................. (1)
- CLS 486 ............... Clinical Immunology ................................................................. (1)
- CLS 487 ............... Medical Mycology ................................................................. (1)

SECOND SEMESTER

- CLS 490 ............... Fin. & Qual. Management of the Cl. Laboratory ......................... (3)
- CLS 491 ............... Clinical Chemistry II ................................................................. (1)
- CLS 492 ............... Clinical Immunohematology III ............................................... (2)
- CLS 493 ............... Clinical Hematology II ............................................................ (3)
- CLS 495 ............... Clinical Microbiology II ............................................................ (2)

Articulation Program

Clinical Laboratory Technician (CLT) or Medical Laboratory Technician (MLT) graduates are encouraged to apply to the UND CLS program. 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 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 CLS program for additional information.

When a student is registered in 300 and 400 level CLS courses, a specific CLS tuition is assessed.

Western College Alliance for Clinical Laboratory Science (WCACLS) Education

The Clinical Laboratory Science program is affiliated with Bemidji State University, Bemidji, MN; Jamestown College, Jamestown, ND; Minot State University, Minot, ND; Montana State University, Billings and Bozeman, MT; South Dakota State University, Brookings, SD; University of Mary, Bismarck, ND; University of Montana, Missoula, MT; 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 CLS program. Students from these institutions apply to the UND CLS program for their final year of study. Upon completion, they receive a certificate from the University of North Dakota verifying completion of 12 months of clinical training in the UND NAACLS accredited program. They are then eligible for a degree in Clinical Laboratory Science or a related major from their respective institution and eligible to complete a national certification exam.

B.S. Degree, 4+1, and WCACLS Students (Professional Curriculum Year 2)

A summer practicum experience on the UND campus in Grand Forks, ND is required, followed by approximately seven months 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 and specific antibody titers are required by all clinical affiliates prior to work with patients. Students are responsible for additional costs that include: travel, housing, food, and summer lab course fees during the second year of the professional curriculum.

The program has clinical affiliation agreements with over 40 medical centers in North Dakota, Minnesota, Montana, Colorado and Oregon for the clinical experience. A complete list and description of the current clinical sites is available at http://medicine.nodak.edu/cls.

The CLS program reserves the right to place on probation or to cancel the registration of any student whose performance in the classroom or clinical experience is unsatisfactory.

Program accommodations for qualified handicapped persons will be reviewed upon notification of a prospective student’s needs and limitations.

CLS Categorical Training (Certificate) Program

The CLS Categorical Training (Certificate) program provides advanced skills to baccalaureate prepared students to become eligible to work in a high complexity 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 36 semester hours in biology, chemistry and/or medical sciences (in addition to or part of the baccalaureate degree). It includes four “category” choices: Immunohematology, Chemistry/Urinalysis, Microbiology, or Hematology. The curriculum includes both an academic and a clinical component. When a student is registered in 300 and 400 level CLS courses, a specific CLS tuition is assessed. The curriculum for each categorical is as follows:
Clinical Laboratory Science

CLINICAL CHEMISTRY/URINALYSIS

CLS 336 Laboratory Calculations 1
CLS 460 Laboratory Practice Theory 4
CLS 461 Laboratory Practice Application 1
CLS 471 Clinical Microscopy and Urinalysis 2

Total Categorical Credits 17*

HEMATOLOGY/HEMOSTASIS

CLS 325 Hematology Laboratory 2
CLS 325L Hematology Laboratory 3
CLS 336 Laboratory Calculations 1
CLS 460 Laboratory Practice Theory 4
CLS 461 Laboratory Practice Application 1
CLS 473 Clinical Hemostasis 2
CLS 482 Clinical Hematology I 1
CLS 493 Clinical Hematology II 2

Total Categorical Credits 18*

IMMUNOLOGY

CLS 301 Immunology 2
CLS 336 Laboratory Calculations 1
CLS 460 Laboratory Practice Theory 4
CLS 461 Laboratory Practice Application 1
CLS 463 Immunohematology/Immunology Lab 2
CLS 470 Clinical Immunohematology I 1
CLS 477 Clinical Immunohematology Theory 1
CLS 480 Clinical Immunohematology II 2
CLS 492 Clinical Immunohematology III 2

Total Categorical Credits 16*

MICROBIOLOGY

CLS 234 Parasitology 2
CLS 336 Laboratory Calculations 2
CLS 394 Medical Microbiology (recommended) 2
CLS 460 Laboratory Practice Theory 4
CLS 461 Laboratory Practice Application 1
CLS 478 Medical Microbiology Theory and Laboratory 2
CLS 484 Clinical Microbiology I 2
CLS 487 Clinical Mycology 1
CLS 495 Clinical Microbiology 2

TOTAL 16*

*Eligible for Categorical National Certification Exam

Online Courses

There are many courses offered by the CLS program through online or distance learning. The primary method of distance learning course delivery is WEB based. Students participating in online coursework are required to have Internet access. Specific computer requirements are available from the CLS program.

Graduate Level Programs

A Master of Science (M.S.) degree with a major in CLS and a certificate program in CLS Management is available. The graduate level programs are described in the graduate section of this catalog and at http://www.medicine.nodak.edu/cls.

Courses

The Clinical Laboratory Science program is part of the Division of Medical Laboratory Sciences in the Department of Pathology. The Clinical Laboratory Science (CLS) courses that are offered are listed below.

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. F

234. Human Parasitology. 2 credits. Physiological aspects of human parasites, their symbiotic host parasite relationships and clinical diagnostic techniques. S

234L. Human Parasitology Laboratory. 1 credit. Laboratory methods for the identification and diagnosis of human parasites. S

230. Computer and Statistical Application in Clinical Laboratory Science. 2 credits. Clinical applications of modern information systems, terminology, word processing, data base, spread sheet and statistical analysis including normal and binomial distribution, t-tests, chi square tests, analysis of variance, linear regression and correlation. S

301. Immunology. 2 credits. Principles of clinical immunology focusing on the cellular and molecular nature of antigens and immunoglobulin, the immune response, immunogenetics, and immune mediated disease. S


325L. Hematology Laboratory. 2 credits. Corequisite: CLS 325. Morphologic examination of blood and bone marrow and laboratory testing used in hematological study. S

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. F

360. Histopathology Laboratory Theory. 3 credits. This course presents an overview of histopathology laboratory calculations, safety, quality assurance, information management, laboratory education, instrumentation, and proper specimen collection and handling. F

361. Histology Laboratory Technique. 1 credit. Techniques and practice in use of general laboratory equipment, reagents and procedures utilized in histology. S

362. Histotechniques I. 3 credits. This course is the introduction to the fundamental techniques, including fixation, processing, instrumentation, sectioning and staining with emphasis on the Hematoxylin and Eosin stain. F

368. Histology Practicum I. 3 credits. Individual assignments in an accredited histology lab. Emphasis on refining skills learned in Histology Practicum I, staining procedures and tissue identification. S

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. SS

393. Immunohematology/Immunology Laboratory. 2 credits. Corequisite: CLS 301. Theory and practical application of laboratory investigations of immunology serology, and immunohematology. S

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. S

399. Special Topics in Clinical Laboratory Science. 1-13 credits. Lecture, discussion, and readings on topics of current interest in the clinical laboratory sciences. F, S, SS

430. Clinical Practicum I. 13 credits. Applied theory and practice at the clinical affiliate. F

440. Clinical Practicum II. 12 credits. Techniques and practice in the clinical affiliate. S

460. Laboratory Practice Theory. 4 credits. This course represents an overview of standard laboratory practices including safety, management of service and quality, information management and laboratory education, instrumentation and equipment, research and specimen collection and handling. F,S,SS

461. Laboratory Practice Application. 1 credit. Techniques and practice in use of general laboratory equipment, reagents and procedures. F,S,SS

470. Clinical Immunohematology I. 1 credit. Practical application of modern transfusion techniques, component therapy, and quality assurance. SS

471. Clinical Chemistry Theory, Principles, Procedures, and Correlations. 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. SS

472. Clinical Laboratory I. 1 credit. Theory and practice of phlebotomy in the clinical setting, specimen processing, review of state and federal regulations, safety and blood hazard compliance, interpersonal relationship skills. SS

473. Clinical Hemostasis. 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. SS

474. Clinical Microscopy & Urinalysis. 2 credits. Theory, techniques, and practice of microscopy and urinalysis with emphasis on identification of elements in the sediment. S

475. 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. F

477. Clinical Microbiology and Immunology Theory. 1 credit. Theory of modern transfusion techniques, component therapy, and quality assurance. SS

478. Clinical Pathology. 1 credit. Discussions of modern transfusion techniques, component therapy, and quality assurance. SS


481. Clinical Chemistry I. 3 credits. Applied theory and practice in clinical chemistry at the clinical affiliate. F
482. Clinical Hematology I. 2 credits. Emphasis on interpretive correlation of hematology findings and pathophysiology. Topics of current interest and advances in hematology. F
483. Clinical Laboratory II. 1 credit. Techniques and practice in routine phlebotomy at the clinical affiliate. Annually.
484. Clinical Microbiology I. 2 credits. Applied theory and practice in clinical microbiology at the clinical affiliate. F
485. Clinical Laboratory III. 1 credit. Observation, practice, or research in specialized areas or settings at the clinical affiliate. F
486. Clinical Immunology. 1 credit. Applied theory and practice in clinical immunology and serology at the clinical affiliate. F
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. F
490. Financial and Quality Management of the Clinical Laboratory. 3 credits. Corequisite: Enrollment in clinical practicum coursework. 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. Annually.
491. Clinical Chemistry II. 2 credits. Techniques and practice in clinical chemistry at the clinical affiliate. F
492. Clinical Immunohematology III. 2 credits. Techniques and modern transfusion practices at the clinical affiliate. S
495. Clinical Microbiology II. 2 credits. Techniques and practice in clinical microbiology at the clinical affiliate. S

**School of Communication (Comm)**

**Dumova, Fiordo, Holden, Horosewski, Householder, Kalbflieisch (Director), Rakow, Rendahl and Shafer**

The School of Communication (SComm) offers a comprehensive, integrated curriculum in communication that focuses 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 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. A minor in Communication is also offered.

**Liberal Arts Emphasis.** Students are encouraged to acquire a broad general education in the arts and humanities, social sciences, and natural sciences. National accreditation rules for programs offering professional training in journalism and mass communication require students to earn a minimum of 80 semester credits outside the School. At least 65 of these credits must be in courses approved for the University’s general education requirements and those offered by the traditional liberal arts departments.

**Facilities and Special Programs.** The School has computerized writing, graphics, and editing laboratories, as well as its own reading room that houses a wide selection of daily and weekly newspapers and professional journals. The University’s Television Center facility is available for student training.

The Native Media Center’s mission is to promote diversity in communication by enhancing awareness of Native American issues among media professionals and by attracting Native American students into journalism and communication careers. The activities include production of special electronic and print publications and materials written by, about, and for Native peoples.

**Student Opportunities.** Students are encouraged to supplement classroom instruction through work on campus publications, a national award-winning television program, and supervised, professional internships.

Student organizations include chapters of the American Advertising Federation, Lambda Phi Eta Communication Honor Society, the Public Relations Student Society of America, the Society of Professional Journalists and Women in Communication. Another program in the School is the Northern Interscholastic Press Association, which serves high school journalism programs in North Dakota and northern Minnesota.

**Admission Requirements.** Admission to the College of Arts and Sciences does not automatically carry admission to the School of Communication. Students planning to pursue a major through the School should declare Pre-Communication as their intended major. In order to reach the next level, that of Admitted Major, Pre-Communication—and those who are pursuing an Admitted Minor status—must:

- Pass Comm 102 or 103 and Engl 110 with a grade of C or better
- Pass an English Proficiency Test administered by UND’s Testing Center
- Have a 2.50 overall GPA (which must be continued in order to take courses in Communication. At graduation, GPA must also be at least 2.50.)
- Have earned at least 24 semester credits
- Have his or her assigned faculty adviser approve a personal Plan of Study contract

Students are classified as Pre-Communication majors until they have completed these requirements. Additional information about the application process is available from the School’s Admissions and Advising Director.

Attaining Admitted Major status opens many restricted classes. In addition, students are eligible for SComm scholarships when they are admitted majors.

**Transfer Students’ Communication Credits.** Communication students transferring into the School of Communication from other universities may bring in a maximum of nine communication credits, but no more than six of the nine may be in upper division.

**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. General Education Requirements (note: Communication pre-majors, admitted majors and admitted minors cannot count Communication courses toward these requirements.)

II. Liberal Arts Courses and others not in the Communication Major

Students must complete 80 hours of courses outside of the School, 65 of which must include GERs and traditional liberal arts credits. Traditional liberal arts departments include: Anatomy, Anthropology, Art, Biology, Chemistry, English, Fine Arts, Geography, Geology, History, Humanities, Honors, Indian Studies, Languages, Mathematics, Music, Peace Studies, Philosophy, Political Science, Physics, Psychology, Religion, Sociology, Theatre Arts, and Women Studies.

III. Major Requirements

Required minimum of 37, maximum of 45. Communication majors may not exceed 45 credits in the major within the 125 credits of graduation. Communication majors must earn a grade of “C” or better in all Communication courses.

**Level A:** SURVEY

6 credits required

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm 102</td>
<td>Communication and the Human Community</td>
<td>3</td>
</tr>
<tr>
<td>Comm 103</td>
<td>Information, Technology and Social Change</td>
<td>3</td>
</tr>
</tbody>
</table>

**Level B:** SKILLS/ THEORY

15 credits required, at least one course in each category

| COMMUNITY | |
|-----------||
| Comm 110 | Fundamentals of Public Speaking | 3 |
| Comm 201 | Visual Communication | 3 |
| Comm 212 | Interpersonal Communication | 3 |
| Comm 303 | Principles of Public Relations | 3 |
| Comm 341 | Advertising Creative Strategy | 3 |
| Comm 365 | Small Group Discussion | 3 |
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 social 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

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

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

200. Introduction to Media Writing. 3 credits. Prerequisites: Admitted Communication major. Keyboarding skills required. Introduction to writing in the various styles and forms required in journalism, advertising, broadcasting, public relations and speech communication. F,S

201. Visual Communication. 3 credits. An examination of the history and development of design in visual communication with emphasis on design components in visual literacy. Images in news and advertising, photography, film and television are examined using theoretical, ethical, and critical perspectives. F

204. Graphic Design. 3 credits. Corequisite: Admitted Communication major. Introduction to theory and practice of graphic design for print and digital media. Emphasis on graphic design principles and elements of design. Typography, corporate symbology, logotypes, and spatial relationships are explored. Involves creating a series of portfolio-ready graphic design artifacts. F

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

226. Photo Imaging. 3 credits. Prerequisite: Admitted Communication major. Introduction to the practice of photography. Film developing, print making, photographic composition. Emphasis on the purposes of photography. F

300. Communication and Society. 3 credits. Prerequisites: Comm 102 or 103 or instructor consent. Explores the interrelationships of society and forms of communication. Objectives include developing knowledge of the media, an ability to discuss in an informed manner the issues of communication in a democratic society and to develop an awareness of intelligent use of the media. F,S

301. Psychology of Communication. 3 credits. Prerequisite: Admitted Communication major or instructor consent. Analysis of the nature and function of communication in interpersonal relationships, special consideration of recurring patterns of communication behavior and the relations among personal characteristics and communications. S

302. Popular Culture. 3 credits. Prerequisite: Admitted Communication major or instructor consent. Critical analysis of culture(s), their characteristics, and the relationship between media, interpersonal communication, and broader cultural patterns. A look at how popular culture works and influences the public and how everyday actions, objects and experiences affect us. A critical look at the ways in which culture is defined by such elements as fashion, shopping malls, television, film, music, books, newspapers and the internet. F

303. Principles of Public Relations. 3 credits. Examines public relations as a professional communication and management function, applications within a range of organizations, and PR’s impact on society and role in community-building. In-depth analysis of the PR campaign process, PR media and publicity. Ethical and legal considerations. F,S

305. Publications. 3 credits. Prerequisite: Admitted Communication major. An overview of the print production process from concept to distribution. Includes publication conceptualization, design and production, budgeting, pre-press and printing processes. F

306. Advertising Media Planning. 3 credits. Prerequisite: Admitted Communication major. An introduction to the complexities of buying space and time for advertising clients. Includes devising and using effective advertising objectives, strategies and tactics; appropriation of advertising budgets and the effective allocation of budgets to various media; the use of secondary data for target-audience cost efficiency, reach and frequency analysis. Developing advertising strategies and tactics to reach culturally diverse audiences and how this affects media buying. S

308. Argumentation. 3 credits. Prerequisite: Admitted Communication major. An introduction to the philosophical development of argument, basic components of argument, kinds of argument structures and practical application of argumentation. S

310. Media and Diversity. 3 credits. Prerequisites: Admitted Communication major. Study of minority status within mass media organizations and in media content from historical, contemporary and speculative points of view. S
100

Communication Sciences and Disorders (CSD)
Alfonso, Biberdorf, Fire, Madden (Chair), Rami, Schill, Seddoh and Swisher

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 with 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 who sign.

**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. General Education Requirements (see University GER listing).
   (Laboratory science requirement to be met by 4 credits of anatomy, biology or physics)

II. The Following Curriculum

A. Major Course Requirements

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSD 233</td>
<td>Anatomical and Physiological Basis of Speech and Hearing Mechanism</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 &amp; Disorders</td>
<td>(4)</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)</td>
</tr>
<tr>
<td>CSD 343L</td>
<td>Language Development Laboratory</td>
<td>(1)</td>
</tr>
<tr>
<td>CSD 382*</td>
<td>Introduction to Pracicum</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 422</td>
<td>Neuroanatomy</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 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 460</td>
<td>Senior Seminar</td>
<td>(1)</td>
</tr>
<tr>
<td>CSD 484</td>
<td>Clinical Practicum I: Speech-Language Pathology</td>
<td>(2)</td>
</tr>
<tr>
<td>CSD 485</td>
<td>Clinical Practicum II: Speech-Language Pathology</td>
<td>(2)</td>
</tr>
</tbody>
</table>

Total Credit Hours 48

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

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Total Credit Hours 6

C. Courses required in other departments:

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psy 241</td>
<td>Introduction to Statistics</td>
<td>(4)</td>
</tr>
<tr>
<td>Psy 250</td>
<td>Developmental Psychology</td>
<td>(4)</td>
</tr>
<tr>
<td>Psy 270</td>
<td>Abnormal Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 209</td>
<td>Introduction to Linguistics</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 103</td>
<td>College Algebra or (above)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

A course in gerontology is required of all undergraduate majors in CSD. The following are suggested: Psy 355, Soc 352.

Total Credit Hours 20

* Admission to this course will require an overall GPA of at least 2.50, a grade of C or better in all CSD courses.

D. Courses Required for Teacher Certification

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 121</td>
<td>Introduction to Indian Studies</td>
<td>(3)</td>
</tr>
</tbody>
</table>

**SPEECH, LANGUAGE, AND HEARING CLINIC**

The Clinic provides an opportunity for students to gain practical experience in speech and language evaluation and treatment procedures as student clinicians and provides a basis for research into 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:

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSD 101</td>
<td>American Sign Language I</td>
<td>(2)</td>
</tr>
<tr>
<td>CSD 102</td>
<td>American Sign Language II</td>
<td>(2)</td>
</tr>
<tr>
<td>CSD 201</td>
<td>American Sign Language III</td>
<td>(2)</td>
</tr>
<tr>
<td>CSD 202</td>
<td>American Sign Language IV</td>
<td>(2)</td>
</tr>
<tr>
<td>CSD 343</td>
<td>Language Development</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 363</td>
<td>Introduction to Deaf Studies</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 209</td>
<td>Introduction to Linguistics</td>
<td>(3)</td>
</tr>
<tr>
<td>Anth 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>(3)</td>
</tr>
</tbody>
</table>

**Courses**

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.

201. American Sign Language II, 2 credits. Prerequisites: CSD 101. 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.

202. American Sign Language IV, 2 credits. Prerequisites: CSD 101, 102, 201. 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.
Computer Science (CSci)

Engel, Grant, Hu, Kim, Liu, Mahalko, Marsh, O’Neil (Chair), Reza, Stokke and Wiggen

The underlying goal of the Department of Computer Science is to provide up-to-date, quality instruction in its undergraduate and graduate programs. In support of this goal, a curriculum has been developed which encourages a formal, abstract, theoretical approach to the study of computer science while providing students with experience on state-of-the-art equipment. The degree programs are designed to provide a background of professional education for careers in business, science, government, and industry, and to furnish a strong foundation for graduate study in computer science.

The department offers a Bachelor of Science in Computer Science through the John O. Odegard School of Aerospace Sciences and a Bachelor of Arts with a Major in Computer Science through the College of Arts and Sciences. A minor in computer science is also available.

The B.S. program provides the strongest mathematical and scientific background. It is recommended for students who intend to pursue graduate studies or to seek employment involving technical or scientific applications of computing. The B.S. degree is accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: 410-347-7700.

The B.A. program offers more flexibility with fewer requirements relating to science and mathematics, but with additional requirements for courses in the humanities. This degree program is recommended for students pursuing a broader-based liberal arts education.

Optional specializations in Network and Operating Systems Analysis, Software Engineering, Game Development and Computer Animation, and Information Technology are available in conjunction with the B.S. degree programs.

In addition to the majors and minors, several courses are offered to provide basic knowledge of computer technology and programming for students wishing to use the computer as a tool in other disciplines.

John D. Odegard School of Aerospace Sciences

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

I. General Education Requirements (see University GER listing).

II. Requirements of the Odegard School of Aerospace Sciences. See College listing.

III. Courses from computer science as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSci 160</td>
<td>Computer Science I</td>
<td>(4)</td>
</tr>
<tr>
<td>CSci 161</td>
<td>Computer Science II</td>
<td>(4)</td>
</tr>
<tr>
<td>CSci 242</td>
<td>Algorithms and Data Structures</td>
<td>(3)</td>
</tr>
<tr>
<td>CSci 250</td>
<td>Assembly Language Programming</td>
<td>(4)</td>
</tr>
<tr>
<td>CSci 289</td>
<td>Social Implications of Computer Technology</td>
<td>(3)</td>
</tr>
<tr>
<td>CSci 363</td>
<td>User Interface Design</td>
<td>(3)</td>
</tr>
<tr>
<td>CSci 365</td>
<td>Organization of Programming Languages</td>
<td>(3)</td>
</tr>
<tr>
<td>CSci 370</td>
<td>Computer Architecture</td>
<td>(3)</td>
</tr>
<tr>
<td>CSci 435</td>
<td>Formal Languages and Automata</td>
<td>(3)</td>
</tr>
<tr>
<td>CSci 441</td>
<td>Operating Systems I</td>
<td>(3)</td>
</tr>
<tr>
<td>CSci Electives*</td>
<td></td>
<td>(12)</td>
</tr>
</tbody>
</table>

* All Computer Science electives must be at or above the 200 level. A combined total of at most 6 credits from Csci 260, 297, 397 or 494 may be applied toward these electives.

IV. Courses from other departments as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 201</td>
<td>Introduction to Digital Electronics</td>
<td>(2)</td>
</tr>
<tr>
<td>EE 202</td>
<td>Electrical Engineering Laboratory</td>
<td>(1)</td>
</tr>
</tbody>
</table>
Math 208 .......... Discrete Mathematics .................................................. (3)
Math 165, 166 .... Calculus I and II ......................................................... (4)
Approved math elective .................................................................... (3)
Approved probability/statistics elective ........................................... (3)
Approved 2-semester laboratory science sequence ...........................(8)
2 approved courses in science or quantitative methods.................(6-8)

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. General Education Requirements (see University GER 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 .................................................... (3)
CSCI 242 .......... Algorithms and Data Structures .................................. (3)
CSCI 250 .......... Assembly Language Programming .............................. (4)
CSCI 365 .......... Organization of Programming Languages .................... (3)
CSCI 370 .......... Computer Architecture ................................................. (3)
CSCI 435 .......... Formal Languages and Automata .................................. (3)
CSCI 451 .......... Operating Systems I ...................................................... (3)
CSCI 465 .......... Principles of Translation ............................................... (3)
CSCI Electives* .................................................................................. (12)
* Electives may be selected from CSCI 260 (at most 3 hours), CSCI 289, CSCI 297 or CSCI 397 (at most 3 hours) and any other Computer Science courses numbered 300 or above.

IV. Courses from other departments as follows:
Level IV proficiency in a language other than English
A minor or a second major
EE 201 .......... Introduction to Digital Electronics .................................. (2)
EE 202 .......... Electrical Engineering Laboratory .................................... (1)
Math 208 .......... Discrete Mathematics ................................................ (3)
Phil 350 .......... Symbolic Logic ................................................................ (3)
Approved probability/statistics elective ........................................... (3)

MINOR IN COMPUTER SCIENCE
Courses from Computer Science as follows:
CSCI 160 .......... Computer Science I ...................................................... (4)
CSCI 161 .......... Computer Science II .................................................... (3)
CSCI 250 .......... Assembly Language Programming ................................(4)
CSCI Electives* .................................................................................. (9)
* All 9 credits of Computer Science electives must be 200 level or above.

OPTIONAL SPECIALIZATIONS
A student’s coursework in either the B.S. program, the B.A. program, or the Minor program above may be designed to complete one or more of the following three specializations. Each specialization completed will be noted on the student’s academic record.
I. Network and Operating Systems Analysis
Coursework must include:
CSCI 327 .......... Data Communications ............................................... (3)
CSCI 370 .......... Computer Architecture ................................................. (3)
CSCI 389 .......... Computer Security .................................................... (3)
CSCI 451 .......... Operating Systems I ...................................................... (3)
and two courses from the following list:
CSCI 260 .......... Advanced Programming Languages: C++ or PERL ........ (3)
CSCI 427 .......... Advanced Data Communications ................................. (3)
CSCI 452 .......... Operating Systems II .................................................. (3)
CSCI 551 .......... Distributed Operating Systems .................................... (3)
CSCI 555 .......... Computer Networks .................................................. (3)

II. Software Engineering
Coursework must include:
CSCI 242 .......... Algorithms and Data Structures .................................. (3)
CSCI 365 .......... Organization of Programming Languages .................... (3)
CSCI 463 .......... Software Engineering .................................................. (3)
and three courses from the following list:
CSCI 260 .......... Advanced Programming Languages: C++ .................... (3)
CSCI 363 .......... User Interface Design .................................................... (3)
CSCI 465 .......... Principles of Translation ............................................... (3)
CSCI 562 .......... Formal Specification Methods ....................................... (3)
CSCI 565 .......... Advanced Software Engineering ................................ (3)

III. Information Technology
Coursework must include:
CSCI 351 .......... File Structures ............................................................ (3)
CSCI 389 .......... Computer and Network Security .................................. (3)
CSCI 455 .......... Database Management Systems ................................ (3)
CSCI 457 .......... E-Commerce Systems .................................................. (3)
and two courses from the following list:
CSCI 260 .......... Advanced Programming Languages: PERL ................. (3)
CSCI 327 .......... Data Communications .................................................. (3)
CSCI 363 .......... User Interface Design .................................................... (3)
CSCI 396 .......... Handheld Computing .................................................... (3)
CSCI 513 .......... Advanced Database Systems ....................................... (3)

A student’s coursework in the B.S. program may be designed to complete the following specialization. This specialization will be noted on the student’s academic record.

IV. Game Development and Computer Animation
Elective coursework must include:
CSCI 384 .......... Artificial Intelligence .................................................. (3)
CSCI 463 .......... Software Engineering .................................................. (3)
CSCI 446 .......... Computer Graphics I ..................................................... (3)
CSCI 448 .......... Computer Graphics II .................................................. (3)
Art 110 .......... Introduction to the Visual Arts ........................................ (3)
Art 112 .......... Basic Design ................................................................. (3)
Approved 2-semester laboratory science sequence must include:
Phys 251 .......... University Physics I ....................................................... (4)
Phys 252 .......... University Physics II ..................................................... (4)
Approved math elective must include:
Math 327 .......... Linear Algebra ............................................................ (3)

Courses

101. Introduction to Computers. 3 credits.
Prerequisite: CSCI 101T.
An overview of the fundamental concepts and applications of computer science. Topics include data storage, hardware, operating systems, and programming principles. F,S,SS

101T. Software Applications Tutorial. 1 credit.
Recommended corequisite: CSCI 101. 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). S/U grading only. F,S,SS

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,S,SS

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

250. Assembly Language Programming. 4 credits.
Prerequisite: CSCI 160 or knowledge of one high-level language. Computer structure, machine representation of numbers and characters, instruction codes and assembly systems. Includes laboratory. F

260. Advanced Programming Languages. 1-3 credits.
Prerequisite: CSCI 161 or consent of instructor. 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. F,S

289. Social Implications of Computer Technology. 3 credits.
Prerequisite: CSCI 120 or 160. 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. S

297. Experiential Learning. 1-3 credits, repeatable to 6.
Prerequisite: CSCI 242.
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. S/U grading only. F,S,SS

327. Data Communications. 3 credits.
Prerequisites: CSCI 250 and Math 208.
An introduction to the concepts of data transmission, communication hardware and protocols, communication software and the design, performance and management of computer networks. F

351. Introduction to File Processing. 3 credits.
Prerequisite: CSCI 242.
Techniques of using mass storage devices. Sequential, random and key-accessed files. B-trees and inverted file structures. S/2
363. User Interface Design. 3 credits. Prerequisite: CSci 161. 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. F

365. Organization of Programming Languages. 3 credits. Prerequisite: CSci 242 & 250. Compile and run time requirements of programming languages, parameter passing and value binding techniques. Vector and stack processing. S

370. Computer Architecture. 3 credits. Prerequisite: CSci 250, EE 201, 202. Introduction to hardware methodologies and software extensions to hardware in computers. Some topics on hardware and software selection will be discussed. S

384. Artificial Intelligence. 3 credits. Prerequisite: CSci 242. 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. S

389. Computer and Network Security. 3 credits. Prerequisite: CSci 161. This course introduces techniques for achieving security in multi-user standalone computer systems and distributed computer systems. Coverage includes host-based security topics (cryptography, instruction detection, secure operating systems), network-based security topics (authentication and identification schemes, denial-of-service attacks, worms, firewalls), risk assessment and security policies. S

397. Cooperative Education. 1-3 credits repeatable to 6. Prerequisite: 15 completed credits in CSci including CSci 363. A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department, and employer. S-U grading only. F,S,SS

399. Topics in Computer Science. 1-3 credits, repeatable to 12. Prerequisite: Consent of instructor. Selected topics in Computer Science which allow students to study specialized subjects. F,S

427. Advanced Data Communications. 3 credits. Prerequisite: CSci 327. Analysis of existing and future data communications technologies and protocols, including the modeling of realistic networked environments and the analysis of their performance. S/2

435. Formal Languages and Automata. 3 credits. Prerequisite: CSci 242. An introduction to the Chomsky formal language hierarchy and the automata which correspond to each of the language classes. F

445. Mathematical Modeling and Simulation. 3 credits. Prerequisites: CSci 161 or 170, Math 166 and a statistics course. A study of various mathematical applications for digital computers, including the modeling, simulation and interpretation of the solution of complex systems. S/2

446. Computer Graphics I. 3 credits. Prerequisites: CSci 242, CSci 363, and Math 166. Introduction to computer graphics. Topics include display technology, light and color, 2D and 3D representations, image processing, ray-tracing, and computer animation. S/2

448. Computer Graphics II. 3 credits. Prerequisite: CSci 446. A continuation of CSci 446, topics covered include: image compression, spatial-frequency transformations, sampling theory, and computer game development. F/2

451. Operating Systems I. 3 credits. Prerequisite: CSci 242 and 370. 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. F

452. Operating Systems II. 3 credits. Prerequisite: CSci 451. A study of the implementation of operating systems and parts of operating systems, and development of system software. S/2

455. Database Management Systems. 3 credits. Prerequisite: CSci 242, Database concepts, database administration, database design, and database performance, including the partial design of a DBMS application. F

457. Electronic Commerce Systems. 3 credits. Prerequisite: CSci 351. 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. On demand

463. Software Engineering. 3 credits. Prerequisites: CSci 242 and CSci 363. 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. F

465. Principles of Translation. 3 credits. Prerequisite: CSci 365. Techniques for automatic translation of high-level languages to executable code. F/2

491. Seminars in Computer Science. 1 credit. May be repeated (3 credits maximum). Prerequisite: consent of instructor. A course for advanced students. S-U grading only. F,S

494. Special Projects in Computer Science. 1-3 credits varying with the choice of project. May be repeated (6 credits maximum). Prerequisite: consent of instructor. A course for advanced students. F,S

Counseling Psychology and Community Services
(Coun)
Beal, Juntunen (Doctoral Director), Loewy (Chair), Perry, Pinterits, Schroeder, Wettersten and Whitcomb (Master’s Director)

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 Leisure Services (RLS). The M.A. with a school counselor emphasis is accredited by the National Council for the Accreditation of Teacher Education (NCATE). The Ph.D. in Counseling Psychology is accredited by the American Psychological Association (APA) and prepares graduates for Psychologist licensure in North Dakota, as well as other states. Coursework for the M.A. degree satisfies eligibility requirements for certification 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.

The master’s program provides preparation for counseling practice in community service agencies, universities and colleges, rehabilitation agencies, addiction treatment agencies, or schools, depending upon the emphasis of the student. Admission is based on achievement in undergraduate work, particularly during the junior and senior years, scores on the General Record Exam (General Test) or the Miller Analogies Test, recommendation letters, and relevant experience. Prospective students must have completed at least twenty semester credits of undergraduate coursework in the behavioral sciences (e.g., psychology, sociology) including abnormal psychology, developmental psychology, theories of personality, and statistics. Students are admitted once a year, with completed applications required by February 1 for a summer or fall start date.

Typically, 18-20 students are admitted each year from a pool of 35-55. The masters program requires completion of 48-51 semester credits depending on emphasis (addiction, community agency, rehabilitation, or school). To complete the program in two academic years, part-time summer enrollment is required, along with full-time fall and spring semester course loads. The program includes a two-semester supervised internship at an external agency.

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 Graduate School 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, RHS 250, RHS 309, RHS 310, and Parts IV, V, and VI 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 Graduate School when they have completed a total of 125 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 and COUN 519.

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 the following 35 credits of graduate course work in the Counseling Department: 506, 510, 514, 515, 516, 518, 519, 530, 531, 532, 533, and 580.
3. Completion of 8 credits of COUN 588 – Rehab Counseling Internship.
4. Completion of either COUN 997 – Independent Study (2 cr) or COUN 998 – Thesis (4 cr)

The doctoral degree program, Counseling Psychology, provides advanced preparation in counseling theory, practice, and research. The program accepts students at the post bachelors and post masters level. Admission is based upon achievement in undergraduate and graduate work (if applicable), scores on the Graduate Record Examination (General Test), recommendation letters, and relevant experience. The program requires four years of full-time study at the post bachelors level or three years at the post master’s level, plus a year-long, full-time, external internship. Upon completion, graduates are prepared to work as doctoral level counseling psychologists in a variety of settings, such as university counseling centers, mental health agencies, university departments of counseling or psychology, hospitals and private practice. Five to six students are admitted each year. The application deadline is January 10th for admission the following year.

Details of the bachelor’s, master’s and doctoral degree programs in the Department of Counseling Psychology and Community Services may be found in the respective sections of this catalog or at www.counseling.und.edu. For more information, contact the respective directors, Department of Counseling (701-777-2729).

Courses

Criminal Justice Studies (CJ)
DiCristina, Gottschalk, Hume (Chair), Mayer and Meyer

This program is a cooperative venture that draws on the resources of the Departments of Anthropology, Philosophy, Political Science, 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 Studies 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 CJ 201, CJ 210, Soc 252, and Soc 253 with a minimum grade point average of 2.70 and apply for major status in the College of Arts and Sciences. Following the successful completion of all admission requirements (including GPA requirements), students who have declared Criminal Justice Studies as their major will be notified that they have been accepted into the program. Once admitted, majors will be 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. General Education Requirements (see University GER listing).

II. The Following Curriculum (42 credits):

Preadmission Requirements (12 credits):
CJ 201 ........ Introduction to Criminal Justice ........................................ (3)
CJ 210 ........ Introduction to Policing .................................................. (3)
Soc 252 ........ Criminology ............................................................... (3)
Soc 253 ........ Juvenile Delinquency .................................................. (3)

Required upper division courses (21 credits):
CJ 300 ........ Criminological Theory ..................................................... (3)
CJ 353 ........ Law for Criminal Justice System ..................................... (3)
CJ 401 ........ Administration of Criminal Justice Systems .................... (3)
Soc 323 ........ Sociological Research Methods .................................... (3)
Soc 326 ........ Sociological Statistics .................................................. (3)
Phil 412 ........ Philosophy of Law ...................................................... (3)
Pols 306 ........ American Constitution–Civil Liberties .......................... (3)

9 additional credits from:
Anth 345 ........ Forensic Science ......................................................... (3)
Anth 346 ........ Analysis of Forensic Evidence ..................................... (3)
CJ 302 ........ Women, Crime, and Criminal Justice ......................... (3)
CJ 350 ........ Correctional Alternatives ............................................... (3)
CJ 351 ........ Police Administration .................................................. (3)
CJ 352 ........ Criminal Investigation .................................................. (3)
CJ 361 ........ Victimology ................................................................. (3)
CJ 452 ........ Police Role in Society .................................................... (3)
Soc 351 ........ Corrections ................................................................. (3)

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 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)
Soc 252 ........ Criminology ............................................................... (3)
Soc 253 ........ Juvenile Delinquency .................................................. (3)

9 additional credits from:
Anth 345 ........ Forensic Science ......................................................... (3)
Anth 346 ........ Analysis of Forensic Evidence ..................................... (3)
CJ 302 ........ Women, Crime, and Criminal Justice ......................... (3)
CJ 330 ................. Criminological Theory ..................................................... (3)
CJ 350 ................. Correctional Alternatives ................................................. (3)
CJ 351 ................. Police Administration ...................................................... (3)
CJ 352 ................. Criminal Investigation ..................................................... (3)
CJ 353 ................. Law for Criminal Justice System ....................................... (3)
CJ 361 ................. Victimology ....................................................................... (3)
CJ 452 ................. The Police Role in Society ............................................... (3)
Phil 412 ............... Philosophy of Law ............................................................... (3)
Pols 306 ............... American Constitution—Civil Liberties ......................... (3)
Soc 351 ............... Corrections ....................................................................... (3)

Courses

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

210. Introduction to Policing. 3 credits. Prerequisite: CJ 201. Introduces the student to the specific field of law enforcement. Provides an overview of federal, state, and local law enforcement agencies. Reviews the coordination requirements of the system. S

302. Women, Crime, and Criminal Justice. 3 credits. Prerequisite: CJ majors and minors only. This class will explore the changing roles of women as offenders, as victims, and as professionals in the criminal justice system. Attention will be directed toward empirical findings, conflict theory insights, and the feminist perspective within the discipline. The basic goal of this course is to respectfully enhance understanding of the importance of gender equality within the field of criminal justice and to encourage self-examination of habitual modes of thinking and acting. S

330. Criminological Theory. 3 credits. Prerequisite: CJ majors and minors only. This class will provide an overview of a variety of criminological theories. Attention will be directed toward the study of the major theoretical schools of thought which have influenced the discipline of criminology. The basic goal of this course is to help the student develop an understanding of and appreciation for the insights gained by examining crime and criminals through different theoretical frameworks. F/S

350. Correctional Alternatives. 3 credits. Prerequisites: Restricted to CJ majors and minors. This course is designed to explore and evaluate intervention strategies developed in the criminal justice system as alternatives to institutional corrections in the sentencing of adjudicated persons. Among these options this course will explore community corrections, parole, house arrest, restitution, community service, and the development of intervention services in support of the dispositional S

351. Police Administration. 3 credits. Prerequisite: CJ 210. Restricted to CJ majors and minors. Principles of police administration and organization for a modern police agency. Included are planning and development of organizations, direction, goal identification, etc. F

352. Criminal Investigation. 3 credits. Prerequisites: CJ 210, restricted to CJ majors and minors, and Forensic Science majors. An overview and examination of basic principles and techniques in the criminal investigations procedures and the rules of the law of evidence in criminal court proceedings. F/S

353. Law for Criminal Justice System. 3 credits. Prerequisite: Restricted to CJ majors and minors, and Forensic Science majors. An overview of principles of criminal law and criminal procedure as established by common law and contemporary legal codes in the United States. S

361. Victimology. 3 credits. Prerequisite: CJ majors and minors only. This class will provide an overview of the literature and research concerning victimization. Attention will be directed toward current trends concerning the victim in the American criminal justice system, with particular emphasis on measuring victimization, fear of crime, the impact of victimization on the individual, and victims rights and compensation initiatives. The basic goal of this course is to help the student develop an understanding of the impact of victimization on the victim, those associated with the victim, the criminal justice system, and each of us as individuals. F

397. Cooperative Education, 1-8 credits, repeatable to 16. Prerequisite: CJ 494 (1 cr.) and CJ majors and minors only. A practical work experience with an employer closely associated with the student's academic area. Arranged by mutual agreement among student, department, and employer. Any student registering for CJ 397 will not be eligible to register in CJ 497, Administrative Internship. S/U grading only. F/S, SS

399. Problems in Criminal Justice. 1-3 credits. Maximum of 6 credits. Prerequisite: CJ majors and minors only, consent of instructor. Students study special topics under the direction and supervision of a member of the staff; prior consent of instructor is required before enrollment. F/S

401. Administration of Criminal Justice Systems. 3 credits. Prerequisites: Senior standing. Restricted to CJ majors. This course addresses issues of the nature of organizations, the individual in the organization, group behavior in organizations, processes in organizations, and organizational change as applied to the administration of criminal justice. F/S

452. The Police Role in Society. 3 credits. CJ majors and minors only. The function and role of police in society with a focus on contemporary issues in police organization and administration. S

494. Readings in Criminal Justice. 1-6 credits. Prerequisite: CJ majors and minors only, consent of instructor. Selected readings with oral and written reports. F/S

497. Administrative Internship. 2-12 credits. Prerequisite: CJ 494 (1 credit). Prerequisite: CJ majors and minors only, consent of instructor. Prior approval of instructor required before enrollment. S/U grading only. On-the-job training in a criminal justice position with final report and analysis of the agency by the intern. F/S, SS

Cytotechnology

T. Weiland, M.D. (Medical Director)
K. Hoffman, MM, SCT (Program Director)
K. Droog, SCT (Education Coordinator)

Cytotechnology is a high level medical laboratory specialty centered on the subject of diagnostic cytology, a field practiced by both pathologists and technologists. It specializes in the detection and diagnosis of abnormal human body cells, especially for the diagnosis of cancerous, or pre-cancerous conditions. A cytotechnologist’s work consists primarily of screening cell samples using a microscope searching for abnormal cells. Once found, marked, and interpreted by the technologist, these cells are reviewed by a pathologist. Cytotechnologists are also trained to be proficient in specimen preparation and in laboratory quality assurance methods. Diagnostic cytology practice is documented at UND back to 1952. The Department of Pathology has offered an accredited course in cytotechnology since 1967. In 1975 it was upgraded from a non-credit, certificate course to a four-year, degree granting program, and in 2005 expanded from a six to a eight-student program. Most recently awarded reaccreditation in 2003, this program currently exists as the only such program in North Dakota. Among the affiliated Western Undergraduate Exchange states (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming), the only other training offered in this specialty is in California and Utah.

The UNDMSHS Cytotechnology Program (Path 401, Path 402, & Path 403) is a 12-month professional course. It is designed to be taken as either a 5th year, following a baccalaureate in another major, or as the 4th year of a major in Cytotechnology. Enrollment is limited to 8 students per year. University commencement and program graduation both occur at the end of summer session. Students are selected using criteria of academic performance, references, an interview with program officials, and a background in life sciences. Upon completion of the program, graduates are eligible to take the national certifying examination administered by the Board of Registry of the American Society of Clinical Pathologists.

Applications for admission to the Cytotechnology Program should be submitted to the Program Director. To be eligible for enrollment, applicants must meet the following requirements:

1. They must receive departmental approval.
2. They must have completed all other required courses.
3. Upon successful completion of the program (Path 401, 402, 403), they must be eligible to be awarded a bachelor’s degree (or already possess a degree). For those students who already possess a bachelor’s degree, transcripts must indicate a minimum of 20 semester hours of biological science and 8 of chemistry.

School of Medicine and Health Sciences

B.S. IN CYTOTECHNOLOGY

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:

Anat 204 & 204L ........ Anatomy for Paramedical Personnel and Laboratory ................................................ (3-5)
Biol 150/150L ........ General Biology I & II and Laboratory .... (8)
Biol 369 ....... Histology ............................................................... (4)

12 hours from:
Biol 341 ....... Cell Biology ............................................................... (4)
Biol 357 .......... Genetics ............................................................... (3)
Biol 364 .......... Parasitology ............................................................ (4)
Biol 370 .......... Vertebrate Zoology .................................................. (2)
Economics  

Bagheri, Biederman, Blackwell, Chen, Flynn, Goenner, Hagen, Mialon, O’Neill (Chair), Owens, and da Silva

Economics is the study of how scarce resources are mobilized to meet the economic goals of individuals, businesses, organizations, governments and societies. The study of Economics is typically divided into two parts: macroeconomics (or aggregate economic analysis) studies economics from a broad-based perspective, including problems and issues such as unemployment, inflation and economic growth; microeconomics studies economics in terms of individual components, including problems and issues such as product pricing, competition, regulation and international trade. Students of Economics can expect to become familiar with key economic concepts and laws which give them an analytical perspective that is unique to this discipline, but is of great importance to individuals and to society.

The mission of the Economics Faculty falls into several important and interdependent areas. The faculty offers a curriculum that reflects the current state of knowledge and skills used by professional economists and that fosters an understanding of the workings of modern economies, whether at regional, national or international levels. The Economics Faculty carries out research objectives, consistent with those reported by the University and the College of Business and Public Administration, by completing research leading to publication in professional journals and other research outlets; and, as needed, by providing service-related and contracted research to the city, region and state. The Economics Faculty provides services to the college, university, community, region, the state and professional organizations. This includes: committee service, provision of appropriate expertise in matters relevant to the economics profession; memberships in civic organizations; memberships in professional organizations as well as other relevant service related activities.

All programs in Economics include the necessary undergraduate economics courses for students who intend to pursue graduate level study. In addition, the major in Business Economics and the major in Economics offer a quantitative track which is recommended for students preparing for graduate study in Economics or Actuarial Science. In addition to the aforementioned undergraduate degrees, the Economics faculty offers a Masters of Science in Applied Economics degree. Please see the graduate section of the catalog for more information.

College of Business and Public Administration

B.B.A. WITH MAJOR IN BANKING AND FINANCIAL ECONOMICS

The Economics Faculty together with other faculty in the College of Business and Public Administration offer a major in Banking and Financial Economics that is intended to prepare students for employment with financial institutions and government. The major is comprised of a comprehensive curriculum that provides a background in basic business, economic theory, the principles and practices of banks and other financial institutions, bank regulation, macroeconomic policy and international finance. Experience has shown the graduates of this program are prepared to immediately function in highly responsible positions in financial institutions and regulatory agencies.

All B.B.A. candidates must fulfill the College of Business and Public Administration degree requirements. Required 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. General Education Requirements (see University GER listing: 39 credit hours).

The following are required by CoBPA (12 credit hours)

Comm 110 .......... Fundamentals of Public Speaking ......................... (3)
Math 103 .......... College Algebra ............................................... (3)
Math 165* .......... Applied Calculus I ........................................... (3)
Pols 115 .......... American Government I ................................... (3)

* Math 165, Calculus I, may be substituted for Math 146.

Also, one of the following as required by CoBPA (3 credit hours)

Anth 171 .......... Introduction to Anthropology ......................... (3)
Psyc 111 .......... Introduction to Psychology .................................. (3)
Soc 110 .......... Introduction to Sociology .................................... (3)

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 in the Legal Environment ................... (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)
Bsys 117 .......... Personal Productivity with Information Technology .... (1)
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. General Education Requirements (see University GER listing: 39 credit hours).

The following are required by CoBPA (12 credit hours)

Comm 110 — Fundamentals of Public Speaking (3)
Math 103 — College Algebra (3)
Math 146 — Applied Calculus I (3)
Pols 115 — American Government I (3)
* Math 165, Calculus I, may be substituted for Math 146.

Also, one of the following as required by CoBPA (3 credit hours)

Anth 171 — Cultural Anthropology (3)
Psych 111 — Introduction to Psychology (3)
Soc 110 — Introduction to Sociology (3)

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

Acc 200 — Elements of Accounting I (3)
Acc 201 — Elements of Accounting II (3)
Acc 315 — Business in the Legal Environment (3)
Econ 201* — Principles of Microeconomics (3)
Econ 202* — Principles of Macroeconomics (3)
Econ 210** — Intro to Business and Economic Statistics (3)
Econ 303 — Money and Banking (3)
Econ 317 — Information Systems in Enterprise (3)
Econ 405 — Bank Regulation (3)
Econ 438 — International Money and Finance (3)
Fin 340 — Intermediate Financial Management (3)
Fin 350 — Financial Statement Analysis (3)
* Banking and Financial Economics majors are exempt from the Acc 218 prerequisite.

III. Required Major Courses (25 credit hours):

Acct 301 — Intermediate Accounting I (4)
Econ 338 — International Economics (3)
Econ 339 — Intermediate Macroeconomic Theory and Policy (3)
Econ 365 — Government Regulation of Business (3)
Econ 395** — Special Topics in Economics (1-3)
Econ 409** — Cooperative Education (1-4)
Econ 410** — Empirical Methods in Economics II (3)
Econ 411 — Empirical Methods in Economics II (3)
Econ 414 — Managerial Economics (3)
Econ 416 — Mathematics for Economists (3)
Econ 497* — Internship (1-4)
Fin 321 — Real Estate Finance and Investment (3)
Fin 324 — Real Estate Appraisal (3)
Fin 360 — Capital Market Financing and Investment Strategies (3)
Fin 420 — Investment Analysis and Portfolio Management (3)
Fin 460 — Management of Financial Institutions (3)
Fin 491** — Senior Topics in Finance (1-3)

* No more than 4 hours of electives from Econ 397 and 497 may count toward the elective major courses.
** Approval of the department required.

B.B.A. WITH MAJOR IN BUSINESS ECONOMICS

The major in Business Economics offers 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:

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. General Education Requirements (see University GER listing: 39 credit hours).

The following are required by CoBPA (12 credit hours)

Math 103 — College Algebra (3)
Math 146 — Applied Calculus I (3)
Pols 115 — American Government I (3)
* Math 165, Calculus I, may be substituted for Math 146.

Also, one of the following as required by CoBPA (3 credit hours)

Anth 171 — Cultural Anthropology (3)
Psych 111 — Introduction to Psychology (3)
Soc 110 — Introduction to Sociology (3)

II. College of Business and Public Administration Core Requirements (40 credit hours):
II. Required Major Courses (24 credit hours):

- Econ 201*: Principles of Microeconomics ................................................. (3)
- Econ 202* Principles of Macroeconomics ................................................... (3)
- Econ 210** Introduction to Business & Economic Statistics ....................... (3)
- Econ 303 Money and Banking ................................................................. (3)
- Econ 308 Intermediate Microeconomic Theory & Policy ............................. (3)
- Econ 338 International Economics ........................................................... (3)
- Econ 410** Empirical Methods in Economics I ........................................... (3)

* This course satisfies part of the GER Social Sciences requirement.
** This course satisfies part of the GER Math, Science, and Technology requirement.

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:

- Econ 305* Principles of Banking .............................................................. (3)
- Econ 324* Public Finance ................................................................. (3)
- Econ 330 Business and Economic History ............................................. (3)
- Econ 341 Labor Economics and Labor Relations ..................................... (3)
- Econ 355 Government Regulation of Business ........................................ (3)
- Econ 360 Global Economic Development ................................................ (3)
- Econ 395 Special Topics in Economics .................................................. (1-3)
- Econ 397* Cooperative Education .......................................................... (1-4)
- Econ 400 History of Economic Thought .................................................. (3)
- Econ 405 Bank Regulation ..................................................................... (3)
- Econ 409 Current Issues in Macroeconomics; Policy and Practice .......... (3)
- Econ 411 Empirical Methods in Economics II ........................................... (3)
- Econ 414 Managerial Economics ............................................................ (3)
- Econ 416 Mathematics for Economists ................................................... (3)
- Econ 438 International Money and Finance ............................................ (3)
- Econ 489 Senior Honors Thesis ............................................................... (1-8)
- Econ 495* Readings in Economics .......................................................... (1-3)
- Econ 496* Research in Economics ......................................................... (1-3)
- Econ 497* Internship ............................................................................. (1-4)
- Econ 575 Adv ST: Health Economics ...................................................... (3)

* No more than 6 credit hours of electives from Econ 397, 495, 496, and 497 may count toward the elective major courses.

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

- Econ 411 Empirical Methods in Economics II ........................................... (3)
- Econ 416 Mathematics for Economists ................................................... (3)
- Math 165 Calculus I .......................................................... (3)
- Math 166 Calculus II .......................................................... (3)
- Math 265 Calculus III .......................................................... (4)
- Math 266 Elementary Differential Equations ............................................ (4)
- Math 327 Applied Linear Algebra .......................................................... (3)
- Math 465 Operations Research ............................................................... (3)

* 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.

Required courses (20 credit hours):

- Econ 201 Principles of Microeconomics ................................................. (3)
- Econ 202 Principles of Macroeconomics ................................................... (3)
- Econ 303 Money and Banking ................................................................. (3)
- Econ 308 Intermediate Microeconomic Theory ........................................ (3)
- Econ 309 Intermediate Macroeconomic Theory & Policy ....................... (3)
- Econ 309* Economics Electives ............................................................. (5)

Courses

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; determination and resource allocation under competitive and monopolistic conditions. Review of selected contemporary economic issues. (No credit if Econ 201-202. Principles of Microeconomics and Macroeconomics, have been completed or audited. Not available to students in the College of Business and Public Administration.) F,S

201. Principles of Microeconomics. 3 credits. Open to freshmen. Pre- or corequisite: one of the following: Math 103, 146, 165 or 166. 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. F,S

202. Principles of Macroeconomics. 3 credits. Prerequisite: Econ 201. 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.

206. Survey of Economic Principles: Micro-Macro. 4 credits. Prerequisite: consent of instructor. 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 Accounting; Economic Growth; Business Cycles and Inflation; Fiscal Policy; Monetary Economics; Monetary Policy; and the World Economy. On demand.

210. Introduction to Business and Economic Statistics. 3 credits. Prerequisite: one of the following: Math 103, 146, 165, 166. Policies, factors, and conditions of business and statistical distributions; sampling distributions; statistical inference for means and proportions; hypothesis testing; simple regression and correlation; non-parametric statistics. F,S

308. Mathematics and Statistics for MBA Students. 3 credits. Prerequisite: Approval of MBA director. 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. SS

303. Money and Banking. 3 credits. Prerequisite: Econ 201 and 202. Nature of our current Monetary system; functional analysis of commercial bank operations; limits to bank 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. F,S

305. Principles of Banking. 3 credits. Prerequisite: Econ 303. This course introduces 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. F

309. Intermediate Macroeconomic Theory and Policy. 3 credits. Prerequisite: Econ 201 and 202. 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.) F

309. Intermediate Macroeconomic Theory and Policy. 3 credits. Prerequisite: Econ 201 and 202. 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.) S

324. Public Finance. 3 credits. Prerequisite: Econ 201 and Econ 202. Growth and effects of the public sector of the economy emphasizing effects of taxation and spending on borrowing and debt management and on efficiency and use of resources. F,S

330. Business and Economic History. 3 credits. Prerequisite: Econ 105 or 201 or 202. 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 institutions, technological change, banking, the Great Depression and effects of entrepreneurial and government decisions. F

338. International Economics. 3 credits. Prerequisite: Econ 201 and 202. Economic basis for gain in international trade; capital and population movements; international disequilibrium and the process of balance-of-payments adjustments; tariffs, underdeveloped countries. F,S

541. Labor Economics and Labor Relations. 3 credits. Prerequisite: Econ 201 and 202. 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. F

555. Government Regulation of Business. 3 credits. Prerequisite: Econ 201 and 202. 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. F

380. Global Economic Development. 3 credits. Prerequisite: Econ 201 and 202. This course focuses on economic development issues at the global level. It covers both developing countries in the context of overall economic development, and the political, social and economic factors that have shaped the course of economic development in the modern era. The course examines the economic development process, the role of government in economic development, and the factors that have influenced the pace and success of economic development. F

380. Global Economic Development. 3 credits. Prerequisite: Econ 201 and 202. This course focuses on economic development issues at the global level. It covers both developing countries in the context of overall economic development, and the political, social and economic factors that have shaped the course of economic development in the modern era. The course examines the economic development process, the role of government in economic development, and the factors that have influenced the pace and success of economic development. F

109
395. Special Topics in Economics. 1-3 credits. Prerequisite: Econ 201 and Econ 202. Specific topic will vary from year to year; some years an important development in economic theory, other years, a significant issue in economic policy. On demand.

397. Cooperative Education. 1-4 credits. Repeatable to 6 credits. Prerequisite: Permission of departmental Cooperative Education Coordinator to enroll. A practical work experience with an employer closely associated with the student’s academic area. S-U grading only. F,S

400. History of Economic Thought. 3 credits. Prerequisite: Econ 105 or Econ 201 and 202. 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. S

405. Bank Regulation. 3 credits. Prerequisite: Econ 303. The regulations imposed on 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. S

409. Current Issues in Macroeconomic Policy. 3 credits. Prerequisite: Econ 303. 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. S

410. Empirical Methods in Economics I. 3 credits. Prerequisites: Econ 201, 202 and 210. 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. F

411. Empirical Methods in Economics II. 3 credits. Prerequisite: Econ 410. A continuation of Econ 410, but with a major emphasis on business and economic forecasting. As with Econ 410, there is a heavy emphasis on solving practical problems of the major types common in the Economics profession. S

414. Managerial Economics. 3 credits. Prerequisites: Econ 210, 308; Math 146 or equivalent; EYS 117 or equivalent. A synthesis relating economic theory, statistics, and mathematics to pricing, output, and resource allocation decisions by business firms. S

416. Mathematics for Economists. 3 credits. Prerequisite: Econ 308 and 309; Math 146 and 165. 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. On demand.

420. Economic Education. 3 credits. Prerequisite: Econ 105 or equivalent. Designed for students planning to teach secondary social studies. Curriculum materials and methods of teaching economics; techniques for integrating economics into social studies curriculum. On demand.

438. International Money and Finance. 3 credits. Prerequisite: Econ 303. 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. F


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. F,S,SS

496. Research in Economics. 1-3 credits. Research work and use of original documents; collecting of material and preparing of special topics and bibliographies; familiarizing the student with government publications and other material available for study of economic problems. F,S,SS

497. Internship. 1-4 credits. Prerequisite: Permission of Department Committee on Internships. 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. S-U grading only. F,S,SS

Education and Human Development (EHD)

200. Research in the University Library. 1 credit. Introduction to effective library-based research. Current technologies and traditional methods are emphasized. F,S

250A. Special Topics. (regular grading); 250B. Special Topics (S/U grading). 1-3 credits in any one semester; repeatable to 12 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. F,S

390A. Special Topics (regular grading); 390B. Special Topics (S/U grading). 2 credits. May be repeated.

495A. Special Problems (regular grading); 495B. Special Problems (S/U grading) 1-3 credits in any one semester; repeatable to 12 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. F,S

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

Electrical Engineering (EE)

Bigelow, Faruque, Kaabouch, Miles, Salehfar and Schultz (Chair)

The mission of the department is to provide students with a strong foundation in the traditional and contemporary areas of electrical engineering. The objective of the undergraduate program is to educate students in science and engineering so that they can identify and solve technological problems in society. Social and humanitarian issues are also emphasized in the general education component of the program to provide breadth in education. The program provides graduates with the knowledge, aptitudes, and attitudes which prepare them for corporate and government entry-level positions or to pursue further education at the graduate level.

The department has the following educational objectives:

1. Provide students with a strong foundation in the traditional and contemporary areas of electrical engineering.

2. Educate students in science and engineering so that they can identify, understand, and solve technological problems in society.

3. Provide students with the knowledge and opportunity which prepare them for practice or to pursue further education at the graduate level.

4. Provide students with breadth of knowledge in social and humanitarian issues.

5. Maintain a nationally competitive electrical engineering program.

The department is committed to fostering a close student-faculty educational environment that facilitates self-development, self-confidence, and competence. This commitment extends to providing an excellent undergraduate electrical engineering program that encompasses both breadth and depth. The technical and liberal arts components of the curriculum provide the students with the opportunity for self-development, technical competence, and awareness of economic and ethical responsibilities. The technical curriculum includes: (1) basic engineering science; (2) traditional electrical engineering areas, such as circuits, analog/digital electronics, electric energy conversion, control systems, computer-aided design, and electromagnetic fields; 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. These areas of concentration include systems engineering, power systems planning and distribution, signal processing, controls and robotics, digital design, and applied electromagnetics.

To prepare students for engineering practice, design and hands-on experience are emphasized throughout the curriculum and supported by diverse laboratory facilities to implement design ideas. Students are introduced to subject related design tools in several required and elective courses in preparation for a major senior design experience. Every student is required to complete a comprehensive design project. Computer applications, statistical methods, and writ-
ten/oral/interpersonal communication skills are also emphasized in the curriculum. Cooperative education is encouraged as a vehicle for enhancing students’ communication and interpersonal skills, in addition to establishing an awareness of industrial practices and technical development. Opportunities to enhance teamwork, written and oral communication, and self-learning skills are available across the curriculum. Students are encouraged to promote the profession and develop leadership skills through involvement in honorary and professional societies, as well as participation in laboratory and design project activities.

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 the profession. Through this program, students and faculty establish personal relationships and enthusiasm toward engineering education.

To allow qualified students to complete a graduate degree in one year, beyond that required to receive the baccalaureate degree alone, the department offers combined Bachelor of Science in Electrical Engineering (BSEE)/Master of Science (with a major in Electrical Engineering) and BSEE/Master of Engineering degrees.

See Combined Degree Program under the School of Engineering and Mines for additional 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:

**School of Engineering and Mines**

**B.S. IN ELECTRICAL ENGINEERING**

Required 136 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:

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 101</td>
<td>Introduction to Electrical Engineering</td>
<td>(1)</td>
</tr>
<tr>
<td>EE 201</td>
<td>Introduction to Digital Electronics</td>
<td>(2)</td>
</tr>
<tr>
<td>EE 202</td>
<td>Electrical Engineering Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>Engr 101</td>
<td>Graphical Communication</td>
<td>(3)</td>
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<td>Chem 201</td>
<td>General Statistics</td>
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<td>Chem 120</td>
<td>General Chemistry I</td>
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<td>Math 166</td>
<td>Calculus I, II</td>
<td>(4)</td>
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<td>Engl 110</td>
<td>Composition I</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
<td>(3)</td>
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<tr>
<td></td>
<td>Social Science Elective 1</td>
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**Sophomore Year**

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EE 206</td>
<td>Circuit Analysis</td>
<td>(3)</td>
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<tr>
<td>EE 304</td>
<td>Computer Aided Measurement</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 306</td>
<td>Circuits Laboratory I, II</td>
<td>(1)</td>
</tr>
<tr>
<td>EE 313</td>
<td>Linear Electric Circuits</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 265</td>
<td>Calculus III</td>
<td>(4)</td>
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<td>Math 266</td>
<td>Elementary Differential Equations</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 251</td>
<td>University Physics I &amp; Lab</td>
<td>(4)</td>
</tr>
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<td>Phys 252</td>
<td>University Physics I &amp; Lab</td>
<td>(4)</td>
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<td>Engl 125</td>
<td>Business and Technical Writing</td>
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<td>Arts and Humanities Elective 2</td>
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<td>Engineering Science Elective 3</td>
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**Junior Year**

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<td>EE 306</td>
<td>Junior Laboratory I, II</td>
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<td>EE 314</td>
<td>Signals and Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 316</td>
<td>Electric &amp; Magnetic Fields</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 318</td>
<td>Engineering Data Analysis</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 321</td>
<td>Electronics I</td>
<td>(3)</td>
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<tr>
<td>EE 401</td>
<td>Electric Drives</td>
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<td>EE 405</td>
<td>Control Systems I</td>
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<tr>
<th>Course</th>
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<tr>
<td>EE 409</td>
<td>Distributed Networks</td>
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<tr>
<td>EE 421</td>
<td>Electronics II</td>
<td>(3)</td>
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<tr>
<td>EE 452</td>
<td>Embedded Systems</td>
<td>(3)</td>
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<tr>
<td>Math Elective 4</td>
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<td>(3)</td>
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</tbody>
</table>

**Phil 370** | Ethics in Engineering and Science | (3) |

**EE 480** | Senior Design II | (3) |

**EE 481** | Senior Design II | (3) |

**EE 397** | Cooperative Education, is offered toward the technical electives with SU/grading, 6 credits maximum.

Some of the following courses may be waived by completing Engr 100, Professional Assessment and Evaluation; EE 101, Introduction to Electrical Engineering; EE 201, Introduction to Digital Electronics; EE 202, Electrical Engineering Laboratory; EE 304, Computer Aided Measurement and Controls; EE 397, Cooperative Education; and Engr 101, Graphical Communication. Phil 370, Ethics in Engineering and Science, may be waived, but the University’s general education requirements may not be waived. For the Engr 100 course description, see the Engineering listing.

**B.S. IN ELECTRICAL ENGINEERING with an Aerospace Focus**

Required 138 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:

**Freshman Year**

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<td>EE 202</td>
<td>Electrical Engineering Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>Avit 101</td>
<td>Introduction to Aviation</td>
<td>(5)</td>
</tr>
<tr>
<td>Chem 121</td>
<td>General Chemistry I</td>
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<td>Chem 165</td>
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<td>Math 251</td>
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<td>Econ 201</td>
<td>Principles of Microeconomics</td>
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<td>Arts &amp; Humanities Elective 2</td>
<td>(3)</td>
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<td>Engineering Science Elective 3</td>
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<td>Signals and Systems</td>
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<td>EE 452</td>
<td>Embedded Systems</td>
<td>(3)</td>
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<tr>
<td>Math Elective 4</td>
<td></td>
<td>(3)</td>
</tr>
</tbody>
</table>

**Phil 370** | Ethics in Engineering and Science | (3) |

**EE 480** | Senior Design II | (3) |

**EE 481** | Senior Design II | (3) |

**EE 397** | Cooperative Education, is offered toward the technical electives with SU/grading, 6 credits maximum.

Some of the following courses may be waived by completing Engr 100, Professional Assessment and Evaluation; EE 101, Introduction to Electrical Engineering; EE 201, Introduction to Digital Electronics; EE 202, Electrical Engineering Laboratory; EE 304, Computer Aided Measurement and Controls; EE 397, Cooperative Education; and Engr 101, Graphical Communication. Phil 370, Ethics in Engineering and Science, may be waived, but the University’s general education requirements may not be waived. For the Engr 100 course description, see the Engineering listing.
Phys 252/252L  University Physics II  (4)
Engl 125  Technical and Business Writing  (3)

**Junior Year**

EE 308, 309  Junior Laboratory I, II  (2)
EE 314  Signals and Systems  (3)
EE 316  Electric & Magnetic Fields  (3)
EE 318  Engineering Data Analysis  (3)
EE 321  Electronics I  (3)
EE 401  Electric Drives  (3)
EE 409  Control Systems I  (3)
EE 409  Distributed Networks  (3)
EE 421  Electronics II  (3)
EE 452  Embedded Systems  (3)
Social Science Elective  (3)

**Senior Year**

EE 480  Senior Design I  (3)
EE 481  Senior Design II  (3)
ME 306  Fluid Mechanics  (3)
ME 341  Thermodynamics  (3)
Phil 370  Ethics in Engineering and Science  (3)

Basic or Applied Science Elective  (3)
Electrical Engineering Elective  (3)
EE Elective  (3)
Social Science Elective  (3)

**MINOR IN AVIATION - PROFESSIONAL FLIGHT**

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

- AtSc 110  Meteorology I  (4)
- AtSc 231  Aviation Meteorology  (4)
- Avit 208  Aviation Safety  (3)
- Avit 322  IFR Regulations and Procedures  (3)
- Avit 325  Multi-Engine Systems and Procedures  (2)

1 May be waived for transfer students.
2 Includes a World Cultures course.
3 Senior standing with approval of adviser.
4 EE 481, Senior Design II, will satisfy three credits of the general education requirement in Communications.
5 Basic or Applied Science Elective choices: Avit 421, Advanced Aerodynamics; Chem 122/122L, General Chemistry II; Phys 253/253L, University Physics III; AtSc 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 corequisite lab.
6 Maximum of three credits of EE 490, Advanced EE Problems, allowed as an independent study.
7 Math Elective choices: Math 327, Applied Linear Algebra; Math 461, Numerical Analysis I, and other Math courses 300 level or higher with approval of instructor and adviser.

**B.S. IN ELECTRICAL ENGINEERING with a Biomedical Engineering Focus**

Required 137 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:

**Freshman Year**

<table>
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<tr>
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<tbody>
<tr>
<td>Biol 150  General Biology I  (3)</td>
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<tr>
<td>Biol 150L  General Biology I Laboratory  (1)</td>
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<tr>
<td>Biol 151  General Biology II  (3)</td>
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<td>Biol 151L  General Biology II Laboratory  (1)</td>
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<td>Chem 121  General Chemistry I  (3)</td>
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<td>Chem 121L  General Chemistry I Laboratory  (1)</td>
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<td>EE 101  Introduction to Electrical Engineering  (1)</td>
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<td>EE 201  Introduction to Digital Electronics  (2)</td>
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<td>EE 202  Electrical Engineering Laboratory  (1)</td>
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<td>Econ 201  Principles of Microeconomics  (3)</td>
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<td>Engl 110  College Composition I  (3)</td>
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<td>Engr 201  Statics  (3)</td>
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<td>Math 165, 166  Calculus I, II  (4)</td>
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**Sophomore Year**

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<tbody>
<tr>
<td>AtSc 210  Anatomy for Paramedical Personnel  (3)</td>
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<tr>
<td>EE 206  Circuit Analysis  (3)</td>
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<tr>
<td>EE 304  Computer Aided Measurement and Controls  (3)</td>
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**Junior Year**

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<td>EE 306, 307  Circuits Laboratory I, II  (1)</td>
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<tr>
<td>EE 313  Linear Electric Circuits  (3)</td>
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<tr>
<td>Engl 125  Technical and Business Writing  (3)</td>
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<td>Math 265  Calculus III  (4)</td>
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<td>Math 266  Elementary Differential Equations  (3)</td>
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<td>Phys 251/251L  University Physics I, Laboratory  (4)</td>
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**Senior Year**

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<td>Chem 122L  General Chemistry II Laboratory  (1)</td>
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<td>EE 308, 309  Junior Laboratory I, II  (2)</td>
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<tr>
<td>EE 314  Signals and Systems  (3)</td>
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</tr>
<tr>
<td>EE 401  Electric Drives  (3)</td>
</tr>
<tr>
<td>EE 405  Control Systems I  (3)</td>
</tr>
<tr>
<td>EE 409  Distributed Networks  (3)</td>
</tr>
<tr>
<td>EE 421  Electronics II  (3)</td>
</tr>
<tr>
<td>EE 452  Embedded Systems  (3)</td>
</tr>
</tbody>
</table>

Additional Recommended Pre-Medical Courses:

- Anat 204  Anatomy Laboratory  (2)
- Biol 315  Genetics—Recommended for MCAT  (3)
- Biol 369/369L  Histology (2) and Histology Laboratory (2)
- Biol 420  Neuroscience  (3)
- BMB 301  Biochemistry Lecture  (3)
- Chem 341  Organic Chemistry I  (4)
- Chem 341L  Organic Chemistry I Laboratory  (1)
- Chem 341L  Organic Chemistry I Lab required for UND Medical School  (1)
- Chem 342  Organic Chemistry II  (4)
- Chem 342L  Organic Chemistry II Laboratory  (1)
- Chem 342L  Organic Chemistry II Lab required for UND Medical School  (1)
- Mbio 302  General Microbiology Lecture (2)  (3)
- Mbio 302L  General Microbiology Laboratory  (2)

**B.S. IN ELECTRICAL ENGINEERING with a Computer Science Focus**

(Includes Minors in both Computer Science and Mathematics)

Required 138 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:

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 101  Introduction to Electrical Engineering  (1)</td>
</tr>
<tr>
<td>EE 201  Introduction to Digital Electronics  (2)</td>
</tr>
<tr>
<td>EE 202  Electrical Engineering Lab  (1)</td>
</tr>
<tr>
<td>CSci 160  Computer Science I  (4)</td>
</tr>
<tr>
<td>CSci 161  Computer Science II  (4)</td>
</tr>
<tr>
<td>Engr 201  Statics  (3)</td>
</tr>
<tr>
<td>Math 165, 166  Calculus I, II  (4)</td>
</tr>
<tr>
<td>Chem 121  General Chemistry I  (3)</td>
</tr>
<tr>
<td>Chem 121L  General Chemistry Laboratory  (1)</td>
</tr>
<tr>
<td>Phys 251/251L  University Physics I  (4)</td>
</tr>
</tbody>
</table>
Courses

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

201. Introduction to Digital Electronics. 2 credits. Co-requisite: EE 202. Introduction to the fundamentals of digital circuits design. Logic gates; Boolean algebra; Karnaugh maps; Microprocessors. F,S

202. Electrical Engineering Laboratory. 1 credit. Co-requisite: 201. Introduction to design and implementation of digital electronic circuits. F,S

206. Circuit Analysis. 3 credits. Prerequisite: Math 165. Introduces the fundamentals of electrical engineering, applying these concepts in developing the fundamentals of energy conversion, electronics and circuit theory. F,S

304. Computer Aided Measurement and Controls. 3 credits. Prerequisites: Math 165. 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. F


308. Junior Laboratory I. 2 credits. Prerequisite: EE 307. Corequisite: EE 321. Practical electronics applications and design using theory studied in concurrent third-year electrical engineering courses. F

309. Junior Laboratory II. 2 credits. Prerequisite: EE 308. Corequisite: EE 421. Practical electronics applications and design using theory studied in concurrent third-year electrical engineering courses. S

313. Linear Electric Circuits. 3 credits. Prerequisite: EE 206*. Co-requisite: EE 307. Linear electric circuits in the steady state and transient conditions; two-port circuits; Fourier series and Laplace transforms. F,S

314. Signaux and Systems. 3 credits. Prerequisite: EE 303. Co-requisite: Math 266. Passive filters; Laplace transforms; Fourier series; Z-transform; Nyquist sampling theorem; other topics as time permits (state variables; introduction to control and communications theory; discrete Fourier transform). F

316. Electric and Magnetic Fields. 3 credits. Prerequisite: EE 206*. Corequisite: Math 266. Field produced by simple distributions of electric and magnetic poles, field mapping and application to engineering problems. F

351. Engineering Data Analysis. 3 credits. Prerequisite: EE 206*. Co-requisite: EE 303. 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. F

352. Electronics I. 3 credits. Prerequisite: EE 303. Corequisite: EE 308. Fundamentals of semiconductors, nonlinear discrete components such as diodes and transistors, and integrated circuits; analysis and synthesis of simple electronic circuits, including amplifiers. F

397. Cooperative Education. 1-3 credits. Repeatable. Prerequisites: Admission to the electrical engineering degree program. A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement between student, department, and employer. F,S,S

401. Electric Drives. 3 credits. Prerequisite: EE 314. A study of variable speed drives and their electronic control; analysis and synthesis of power electronics through computer simulations and laboratory implementations. S

405. Control Systems I. 3 credits. Prerequisites: EE 314 and Math 266. Mathematical modeling and dynamic response of linear control systems; stability analysis; design of linear controllers using the root locus and frequency response techniques. F

409. Distributed Networks. 3 credits. Prerequisites: EE 313 and 316. Fundamental transmission systems. F

411. Communications Engineering. 3 credits. Prerequisites: EE 314. Mathematical definition of random and deterministic signals and a study of various modulation systems. On demand.


424. Electronic Circuits. 3 credits. Prerequisite: EE 321. Principles, applications, and design of electronic equipment studied from viewpoint of complete systems. On demand.

428. Robotics Fundamentals. 3 credits. Prerequisite: Math 266 or consent of instructor. Fundamentals of robotic systems: modeling, analysis, design, planning, and control. The project provides hands-on experience with robotic systems. On demand.

430. Radiating Systems. 3 credits. Prerequisite: EE 409. Analysis and synthesis of a variety of telecommunication and sensor systems. On demand.

434. Microwave Engineering. 3 credits. Prerequisite: EE 409 or consent of instructor. Review of transmission lines and plane wave, 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. On demand.

451. Computer Hardware Organization. 3 credits. Prerequisites: EE 201 and 304 or consent of instructor. 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. On demand.

452. Embedded Systems. 3 credits. Prerequisites: EE 201, EE 304 and EE 321. A study of microcontroller hardware and software, with an emphasis on interfacing the microcontroller with external electronic devices such as transceivers, sensors, and actuators for communications and control within an embedded system. On demand.


480. Senior Design I. 3 credits. Prerequisite: Consent of instructor. First course in the two-semester capstone design experience for the electrical engineering undergraduate de-
gree, emphasizing design methodologies, communications, and teamwork. Students will be required to build and test a prototype of the electronic system designed in EE 480, Senior Design I. Students will prepare written reports and deliver oral presentations on their design choices, with critique by the instructor. EE 481 satisfies three credits of the University General Education Requirement in Communication. FS


499. 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. FS

*Course must be completed with a grade of “C” or better.

**Engineering (Engr)**

**MINOR IN ENGINEERING SCIENCE**

The Engineering Science minor is available to non-engineering students, and requires the completion of 20 credit hours of approved coursework, as detailed below with a cumulative GPA of 2.0 or above.

**Required Courses (12 Credits):**

- Engr 201 Statics ............................................................... (3)
- EE 206 Circuit Analysis ............................................. (3)
- Engr 202 Dynamics or Engr 203 Mechanics of Materials ............................................. (3)
- CE 306 Fluid Mechanics or ME 306 Fluid Mechanics or ME 341 Thermodynamics ............................................................... (3)

**Electives Courses (8 credits):**

- Any regularly offered course at the 200 or higher level with the prefix Engr, ChE, CE, EE, GE or ME may be used as elective.

The minor program is administered through the SEM Dean’s Office.

**Courses**

100. Professional Assessment and Evaluation. 1 credit. Prerequisites: Work experience and/or technician school training plus completion of Chemistry I, Physics I and II, and Calculus I, II, and III. (See ChE, CE, EE and ME curricula listings.) Required S-U grading. 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.

101. Graphical Communication. 3 credits. Development of visualization, technical communication, and documentation skills. 3-D geometric modeling as applied to CAD/CAM applications using current methods and techniques commonly found in industry. Introduction to engineering, design and team problem solving. FS

200. Computer Applications in Engineering. 2 credits. Prerequisite: Math 107 or Mathematics Placement Test Protocol (PTP). 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. FS


202. Dynamics. 3 credits. Prerequisite: Engr 201. 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. FS

203. Mechanics of Materials. 3 credits. Prerequisite: Engr 201. 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. FS

460. Engineering Economy. 3 credits. Prerequisite: Econ 201. Simple evaluation of the economic merits of alternative solutions to engineering problems. Evaluations emphasize the time value of money. FS

**English Language and Literature (Engl)**

Beard, Carmichael, Carson, Czerwiec, Dixon, Donaldson, Donehower, Harris-Behling, Huang, Kitzes, Koepe, Koprince, Marshall, Nelson, O’Donnell (Chair), Robison, Weaver-Hightower, Williams and Wolfe

**The English Major**

Both literature in English and the English language are rewarding subjects of study in themselves. Language is the chief mode by which we perceive ourselves and the world; literature, like the other arts, is a way of finding coherence in experience, of giving it shape. The place of English studies among the liberal arts makes them a good foundation for careers of humane work in writing, teaching, publishing, business, librarianship, and the professions of law, medicine, the ministry, and diplomacy, among other fields.

The English major is designed to provide students with a common grounding in the methods of the discipline. These are diverse and include linguistic analysis, rhetorical analysis, and a variety of literary analytical techniques, taught in English 271 and 272. Through survey courses and courses in literature of an earlier historical period, majors gain a sense of the broader cultural, historical, and literary contexts in which acts of reading and writing take place. In addition, majors gain significant practice in disciplined reading, writing, and textual analysis, especially in 400-level courses.

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. General Education Requirements (see University GER 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:

1. Engl 271, Reading and Writing About Texts: A writing-intensive introduction to English Studies offering practice in the conventions of analyzing texts and of writing literary analysis. (3 credits)

2. Engl 272, Introduction to Literary Criticism: A writing-intensive course in which students are introduced to various schools of literary criticism. (3 credits)

3/4. One of the two-course 300-level surveys (6 credits):

- Engl 301 and 302 Survey of English Literature
- Or Engl 303 and 304 Survey of American Literature

5. One of the following courses that focus on literature of an earlier historical period (3 credits):

- Engl 241 World Literature I
- Engl 301 Survey of English Literature (in addition to 303-304 for requirement #4)
- Engl 303 Survey of American Literature (in addition to 301-302 for requirement #3)
- Engl 315 or 316 Shakespeare
6. At least two 400-level courses; 400-level courses require students to develop and complete significant independent research, writing, and/or professional projects.

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: English 309 and either English 308 or 408.

Recommended in the major: English 209, 301, 302, 303, 304, 315, 316, 357, 359 and 365.

II. Admission to the Secondary Program, normally while taking T&L 325. (See College of Education and Human Development for admission and licensing requirements).

III. The Program in Secondary Education, to include:

T&L 325 ...... Exploring Teaching in Secondary Schools
T&L 345 ...... Curriculum Development and Instruction
T&L 350 ...... Development and Education of Adolescents
T&L 386 ...... Field Experience (optional)
T&L 390 ...... Special Topic (developmental reading course is one option of several)

ENGL 421 .. Methods and Materials of Teaching Middle and Secondary School Writing and Language (spring only)
ENGL 422 .. Methods and Materials of Teaching Middle and Secondary School Literature and Reading (fall only)

T&L 443 ...... Multicultural Education
T&L 460 ...... Microteaching
T&L 486 ...... Field Experience
T&L 487 ...... A full semester of student teaching, normally taken during the semester of graduation
T&L 488 ...... Senior Seminar

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 one course in Middle Level Education.

MINOR IN ENGLISH

Required: 20 hours, including:

Engl 271 .......... Reading and Writing About Texts ................................... (3)
Engl 272 .......... Introduction to Literary Criticism ................................... (3)

English electives numbered 300 or above .................................................. (14-15)

Students seeking secondary certification in another discipline who wish to achieve a minor in English should take the following courses as part of the minor: English 309 and either English 308 or 408.

Courses

110. College Composition I. 3 credits. Immersion in college-level critical reading and expository writing, emphasizing revision and careful preparation of manuscripts. Does not apply to English major or minor. FS

120. College Composition II. 3 credits. Prerequisite: Engl 110. Continues the work of College Composition I but emphasizing the production of college-level research and writing. Does not apply to English major or minor. FS

125. Technical and Business Writing. 3 credits. Prerequisite: Engl 110. Continues the work of College Composition I but emphasizing the production of college-level research and writing applicable to business and technical fields. Does not apply to English major or minor. FS

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. FS

225. Introduction to Film. 3 credits. The study of film drama, concentrating on appreciation and evaluation of motion pictures. FS

226. Introduction to Creative Writing. 3 credits. Prerequisite: Engl 110, 120 or 125 or instructor’s permission. An introduction to the types and basic principles of creative writing, taught through a combination of class discussion and practice-writing. FS

227. Introduction to Literature and Culture. 3 credits. A course with alternating topics that asks students to read literary texts of a variety of genres. The course may emphasize form and texts from various historical periods as it introduces students to the pleasures of analyzing text and culture. F S

241, 242. World Literature I & II. 6 credits. Great literature of western Europe, or in the European tradition, studied with emphasis upon intellectual and cultural values. FS

265. Native American Literature. 3 credits. Writings by and about American Indians, studied for understanding and critical appreciation. S

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

272. Introduction to Literary Criticism. 3 credits. A writing-intensive course that introduces students to various schools of literary criticism. Required of English majors. FS

299. Special Topics. 1-4 credits. Repeatable when topics vary. A course for undergraduate students, on topics varying from term to term. FS

301, 302. Survey of English Literature. 6 credits. English literature from its beginnings to the twenty-first century. FS

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-four proficiency in a foreign language, 3 hours of speech, and 3 hours of developmental reading, e.g., T&L 409 or English 359. (For Middle School licensure, 6 hours of developmental reading are required, including T&L 409.) English 421 and 422 do not count toward the 36-hour English major.

II. Admission to the Secondary Program, normally while taking T&L 325. (See College of Education and Human Development for admission and licensing requirements).

III. The Program in Secondary Education, to include:

T&L 325 ...... Exploring Teaching in Secondary Schools
T&L 345 ...... Curriculum Development and Instruction
T&L 350 ...... Development and Education of Adolescents
T&L 386 ...... Field Experience (optional)
T&L 390 ...... Special Topic (developmental reading course is one option of several)

ENGL 421 .. Methods and Materials of Teaching Middle and Secondary School Writing and Language (spring only)
ENGL 422 .. Methods and Materials of Teaching Middle and Secondary School Literature and Reading (fall only)

T&L 443 ...... Multicultural Education
T&L 460 ...... Microteaching
T&L 486 ...... Field Experience
T&L 487 ...... A full semester of student teaching, normally taken during the semester of graduation
T&L 488 ...... Senior Seminar

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 one course in Middle Level Education.
Entrepreneurship (ENTR)  
Stamp, Silvernagel

Entrepreneurship is a multidisciplinary program within the College of Business and Public Administration. This program is primarily directed toward students who want to acquire the skills and experience to start new for-profit and not-for-profit ventures. The entrepreneurship faculty drawn from the faculties of economics, management, marketing, accounting, finance, and industrial technology offer various courses and programs for both business and non-business majors.

The College 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. There is also a three-course entrepreneurship track offered for business majors.

A major in entrepreneurship is also available to business majors. The major is designed to provide students the entrepreneurial skills for either working within an existing entrepreneurial business or establishing their own new ventures. A principal element of the major is the development of a venture plan in Entr 385-Venture Initiation that is refined in the required major courses, ultimately resulting in a plan that is sophisticated enough to be financed and initiated by the student.

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. General Education Requirements (see University GER listing).

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

<table>
<thead>
<tr>
<th>Pre-Business Core (Required 31 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 200, 201 Elements of Accounting I &amp; II ........................................... (6)</td>
</tr>
<tr>
<td>Econ 201 Principles of Microeconomics ..................................................... (3)</td>
</tr>
<tr>
<td>Econ 202 Principles of Macroeconomics ...................................................... (3)</td>
</tr>
<tr>
<td>Econ 210 Introduction to Business and Economics Statistics ........................... (3)</td>
</tr>
<tr>
<td>Elys 117 Personal Productivity with Information Technology .......................... (1)</td>
</tr>
<tr>
<td>Math 103, 146 College Algebra, Applied Calculus I ...................................... (6)</td>
</tr>
<tr>
<td>Pols 115 American Government I ................................................................. (3)</td>
</tr>
<tr>
<td>Comm 110 Fundamentals of Public Speaking .................................................. (3)</td>
</tr>
</tbody>
</table>

One course selected from the following:

| Anth 171 Introduction to Cultural Anthropology ........................................... (3) |
| Psy 111 Introduction to Psychology ............................................................ (3) |
| Soc 110 Introduction to Sociology .............................................................. (3) |

<table>
<thead>
<tr>
<th>Business Core (Required 24 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elys 317 Information Systems in Enterprise ............................................... (3)</td>
</tr>
<tr>
<td>Mkt 305 Marketing Foundations ....................................................................... (3)</td>
</tr>
<tr>
<td>Mgmt 300 Principles of Management .............................................................. (3)</td>
</tr>
<tr>
<td>Fin 310 Principles of Financial Management ................................................ (3)</td>
</tr>
<tr>
<td>Econ 303 Money and Banking ......................................................................... (3)</td>
</tr>
<tr>
<td>Acct 315 Business in the Legal Environment ............................................... (3)</td>
</tr>
</tbody>
</table>

303, 304. Survey of American Literature. 6 credits. The literature of the United States from its beginnings to the twentieth-century. F,S

306. Creative Writing: Fiction. 3 credits. Prerequisite: Engl 226 or instructor’s permission. Intermediate-level study and practice of fiction-writing. F

307. Creative Writing: Poetry. 3 credits. Prerequisite: Engl 226 or instructor’s permission. Intermediate-level study and practice of poetry-writing. F

308. Advanced Composition I. 3 credits. Prerequisite: English 120 or permission of department. Advanced writing. Emphasis on the rhetorical effectiveness and style. F,S

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

315, 316. Shakespeare. 6 credits. Shakespeare’s works studied in chronological sequence. F,S

320. Studies in American Fiction. 3 credits. Repeatable when topics vary. F

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

322. Studies in American Drama. 3 credits. Repeatable when topics vary. S

323. Studies in English Fiction. 3 credits. Repeatable when topics vary. S

324. Studies in English Poetry. 3 credits. Repeatable when topics vary. S

325. Studies in English Drama. 3 credits. Repeatable when topics vary. F

327. 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. F,S

334. Black American Writers. 3 credits. Writing by Black Americans studied for understanding and critical appreciation. S

335. Literature and Culture. 3 credits. Repeatable when topics vary. The study of literature in its cultural context. F,S

370. Language and Culture. 3 credits. Prerequisite: English 209. Interaction of language with other cultural subsystems. (Same course as Anthropology 370.) S

372. Literacy Theory. 3 credits. Prior course recommended: English 272. An exploration of particular writers of, approaches to, or debates within literacy theory and criticism. Topic varies by semester. F,S

397. Cooperative Education. 1-8 credits, repeatable to 15. Prerequisites: 15 credits completed in English. 2.5 GPA, 2.75 GPA in English. A course designed to offer English majors work experience related to their disciplinary training in close reading, careful writing, and interpretative analysis. S/U grading only. F,S,S,S

398. Independent Study. 1-4 credits. For English majors only. Prerequisite: Written consent of the department. Supervised independent study. Only 6 hours may apply to the 36-hour English major. F,S

401. Studies in Medieval Literature. 3 credits. A course in the literature of England in the medieval period. Repeatable when topics vary. F,S

403. Studies in Colonial American Literature. 3 credits. A course in the literature of America in the colonial period. Repeatable when topics vary. F,S

404. Studies in Renaissance Literature. 3 credits. A course in the literature of the English Renaissance. Repeatable when topics vary. F,S,F


406. Studies in Nineteenth Century Literature. 3 credits. A course in literature in English of the 19th Century. Repeatable when topics vary. F


408. Advanced Composition II. 3 credits. Prerequisite: Engl 120 or permission of department. Engl 308 recommended. Intensive work in advanced writing in English Studies or other professional fields. S

409. Art of the Cinematic Drama. 3 credits. Prerequisite: English 225. 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. S

410. Art of Writing: Poetry. 3 credits. Prerequisite: Engl 307 or instructor’s permission. Continues the work of Engl 307, Creative Writing: Poetry, at the advanced level. F

411. Art of Writing: Fiction. 3 credits. Prerequisite: Engl 306 or instructor’s permission. Continues the work of Engl 306, Creative Writing: Fiction, at the advanced level. F

415. Special Topics in Literature. 1-4 credits. A course for advanced students on topics varying from year to year. Repeatable. S

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

418. Advanced Language Acquisition. 3 credits. Prerequisite: English 209. 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. S

419. Teaching English as a Second Language. 3 credits. Prerequisite: English 209. An introduction to the principles of teaching English as a second language, with special attention to tutoring. F

420. Methods and Materials of Teaching Middle and Secondary School Language and Reading. 3 credits. Prerequisites: T&L 325 and T&L 345. Pre- or corequisite: T&L 486. Various teaching methods, strategies and materials used in teaching middle and secondary school English writing and language. For English Education majors only. S

422. Methods and Materials of Teaching Middle and Secondary School Literature and Reading. 3 credits. Prerequisites: T&L 325 and T&L 345. Pre- or corequisite: T&L 486. Various teaching methods, strategies and materials used in teaching middle and secondary school English literature and reading. For English Education majors only. F

424. 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

489. Senior Honors Thesis. 1 to 8 credits; total not to exceed 9. Prerequisite: consent of the Department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F,S
This course introduces students to the basic characteristics of the world of business, including new product development, entrepreneurial finance, and the role of the financial plan in the overall venture plan. The primary focus is on the functions of the financial plan in the overall venture plan as well as sources of venture capital and cash flow management. Students must have completed Mgmt 301, Mgmt 302, and Mgmt 303. Prerequisites: Mgmt 301, Mgmt 302, and Mgmt 303. Students are required to attend a seminar on a variety of topics not covered by regular program offerings. May be initiated by students with approval of the SGS. 

Suggested areas of study include: post-graduate study in exercise science, physical therapy or medicine. The Athletic Training program is offered on a variety of topics not covered by regular program offerings. May be initiated by students with approval of the SGS. 

401. Entrepreneurial Finance. 3 credits. Prerequisites: Entr 385 and Fin 310; Junior or Senior Standing. This course is concerned with the financial functions of a new or entrepreneurial venture. The primary focus is on the functions of the financial plan in the overall venture plan as well as sources of venture capital and cash flow management. 


Family Medicine (FMed)

Beattie (Chair), Greek, Hunt, Mann, Paine, Poolman, Rambough, Rudd, Seeger, Tsuchiya, Westereng, and Ziegler

The Department of Family Medicine offers the B.S. in Athletic Training degree under the auspices of the Division of Sports Medicine. This degree program was formally approved by the North Dakota Board of Higher Education in September, 1990. Athletic Training was recognized as an allied health field by the AMA in June, 1990. 

The degree program entails a four-year curriculum designed to prepare the student for an entry-level position in the field of athletic training. Upon completion of the curriculum, the student will be prepared to take the NATA BOC Certification Examination.

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, 207, 207L, Biol 150 and 150L, and PEKS 310. It is recommended that students applying for this program meet with the academic coordinator early in their freshman year.

Students pursuing the Athletic Training degree are encouraged to utilize the electives in this program to prepare for advanced study. Suggested areas of study include: post-graduate study in exercise science, physical therapy or medicine. The Athletic Training program is offered on a variety of topics not covered by regular program offerings. May be initiated by students with approval of the SGS. 

School of Medicine

B.S. IN ATHLETIC TRAINING

Required 172 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:

Pre-Admission Courses

The student must earn C or better in the following courses to be admitted in the program.

Biol 150/150L General Biology I and Laboratory.........................(4)

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

FMed 207 Prevention and Care of Athletic Injuries .....................(2)

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 the First Aid and CPR certifications or enrollment in:

PXW 310 First Aid and CPR .........................................................(2)

Core Courses

The following core courses are required for the B.S. in Athletic Training:

**Chen 121, 121L General Chemistry I/Laboratory ......................(4)

**Chem 311, 311L General Chemistry II/Laboratory .....................(4)

**Comm 110 Fundamentals of Public Speaking .........................(3)

**Engl 110 College Composition I ..........................................(3)

**Engl 120 College Composition II ..........................................(3)

**OT 101 Medical Terminology ..............................................(1)

**Phys 161, 161L Introductory College Physics I/Laboratory ..........(4)

**Phys 262, 262L Introductory College Physics II/Laboratory ........(4)

**Psych 115 Introduction to Psychology .....................................(3)

**Psych 241 Statistics for Behavioral Science ...........................(4)

Psych 250 Developmental Psychology .......................................(4)
Courses

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. ES

200. Understanding Medicine, 3 credits. An introduction to the roles and responsibilities of the medical staff. ES


207L. Laboratory Prevention and Care of Athletic Injuries, 1 credit. Corequisite: FMed 207. A laboratory course in the care and treatment of athletic injuries.

208. Procedures in Athletic Training, 1 credit. Prerequisites: FMed 207, 207L, Anat 204, 204L. Corequisite: FMed 208L. This course serves as an orientation class for incoming sports health majors. Policies and procedures as well as record keeping are covered. F

211. Beginning Clinical Practicum I in Athletic Training, 1 credit. Prerequisites: FMed 101, 207, and 207L. Corequisites: FMed 208 and 208L. A clinical course designed to allow the student to develop specified clinical competencies in a directed, progressive manner.

208L. Laboratory Procedures in Athletic Training, 1 credit. Prerequisites: FMed 207, 207L, Anat 204, 204L. Corequisite: FMed 208. A course designed to allow students to practice the techniques and procedures for the care and treatment of athletic injuries. F

211. Intermediate Clinical Practicum I in Athletic Training, 2 credits. Prerequisite: FMed 208. A clinical course designed to allow the student to develop specified clinical competencies in a directed, progressive manner.

212. Athletic Training Modalities, 1 credit. A clinical course designed to allow the student to develop specified clinical competencies in sports injury care. S

212L. Laboratory Athletic Training Modalities, 1 credit. Prerequisite: FMed 481. Corequisite: FMed 320. A course designed to teach the student to practice the theoretical and applied principles and techniques for the application of modalities in sports injury care.

300. Advanced Clinical Practicum I in Athletic Training, 2 credits. Prerequisite: FMed 311. A clinical course designed to allow the student to perform specified clinical competencies in a directed, progressive manner.

311. Laboratory Advanced Clinical Practicum I in Athletic Training, 1 credit. Prerequisite: FMed 481. Corequisite: FMed 320. A course designed to teach the student to practice the theoretical and applied principles and techniques for the application of modalities in sports injury care.
B.B.A. WITH MAJOR IN MANAGERIAL FINANCE AND ACCOUNTING

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. General Education Requirements (see University GER listing).

II. The College of Business and Public Administration Requirements, see College listing and including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 200, 201</td>
<td>Elements of Accounting I &amp; II</td>
<td>6</td>
</tr>
<tr>
<td>Acct 315</td>
<td>Business in the Legal Environment</td>
<td>3</td>
</tr>
<tr>
<td>Isys 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
</tr>
<tr>
<td>Acct 201</td>
<td>Money and Banking</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 Economics 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>
<tr>
<td>Mgmt 310</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 475</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>Mktr 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>
</tr>
</tbody>
</table>

One course selected from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anth 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>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>
</tbody>
</table>

III. The Following Major Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 218</td>
<td>Advanced Spreadsheet Applications</td>
<td>3</td>
</tr>
<tr>
<td>Acct 301</td>
<td>Intermediate Accounting I</td>
<td>4</td>
</tr>
<tr>
<td>Acct 321</td>
<td>Real Estate Finance and Investment</td>
<td>3</td>
</tr>
<tr>
<td>Acct 340</td>
<td>Intermediate Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>Acct 360</td>
<td>Capital Market Financing and Investment Strategies</td>
<td>3</td>
</tr>
<tr>
<td>Acct 370</td>
<td>Student Investment Fund I</td>
<td>1</td>
</tr>
<tr>
<td>Acct 420</td>
<td>Investment Analysis and Portfolio Management</td>
<td>3</td>
</tr>
<tr>
<td>Acct 430</td>
<td>International Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>Acct 440</td>
<td>Valuing Real Assets and Financial Strategy</td>
<td>3</td>
</tr>
<tr>
<td>Acct 450</td>
<td>Financial Derivatives</td>
<td>3</td>
</tr>
<tr>
<td>Acct 470</td>
<td>Student Investment Fund II</td>
<td>3</td>
</tr>
</tbody>
</table>

Plus two electives from the following: Acct 302, Fin 350, 460 and 475.

Courses

216. Insurance and Risk Management. 3 credits. The purpose of this course is to provide an introductory, consumer-oriented overview of risk and insurance. Students begin by examining the basic concepts of risk and insurance, insurance fields and functions, regulation, underwriting and the legal framework. Three broad classes of insurance will be addressed: life and health, property and liability, and auto. Other topics include risk management, loss control, risk retention/reduction decisions, loss adjustment, claim settlement, investment functions, disability insurance, retirement programs, negligence and legal liability. F

220. Personal Investing. 3 credits. Investment concepts for individual investors who are, or will be, actively developing and monitoring their own investment portfolio. 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

230. Principles of Real Estate. 3 credits. Principles of real property with an emphasis on home ownership. Real property rights, the process for transferring those rights, the impact of taxation, and concepts of city development. Career options in real estate, including brokerage, appraisal, lending, and property management. F

240. Real Estate Finance and Investment. 3 credits. Principles of real estate finance; market, economic and personal factors affecting real estate prices and values; basic real estate financial analysis; investment opportunities. F

310. Principles of Financial Management. 3 credits. Prerequisites: Acct 201, Isys 117, Econ 210; Sophomore, Junior or Senior Standing; minimum total of 59 credit hours; declared and pre-CoBPA majors only. 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. F,SS

321. Real Estate Finance and Investment. 3 credits. Prerequisites: Fin 310 and Sophomore, Junior or Senior Standing. Nature of real estate finance, financial structure of business organizations and real estate development companies and limited partnerships. F,SS

350. Financial Statement Analysis. 3 credits. Prerequisites: Acct 301 and Fin 310; Sophomore, Junior or Senior Standing; declared CoBPA majors only. Students interpret, restate, evaluate, and forecast financial statements used to report financial performance; and analyze risk and firm value based on reported financial statements. 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 analysis. S

360. Capital Market Financing and Investment Strategies. 3 credits. Prerequisites: Acct 218 and Fin 310; Sophomore, Junior or Senior Standing; declared CoBPA majors only. Covers analysis and procedures for implementing particular financing and investment decisions in financial markets; includes financial analysis of commercial banks, investment banks, pension funds, venture capital sources, insurance companies and limited partnerships. F,S

370. Student Investment Fund I. 1 credit. Repeatable up to a maximum of 3 credits for non-Investments majors. For those who are not Investments majors, approval of Instructor is required. 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. Students enrolled in this course will not make investment decisions, but will be required to evaluate the investment decisions made by the student fund managers. F,S

397. Cooperative Education. 1 to 3 credits. May be repeated to a total of 6 credits. Prerequisites: Acct 200, 201, Isys 117; Econ 201, 202, and 210; approval by Department. On-the-job compensated work experience in various areas of Finance. S, SS

420. Investment Analysis and Portfolio Management. 3 credits. Prerequisites: Fin 340 and 360; Junior or Senior Standing; declared CoBPA majors only. Comprehensive study of methods used to evaluate securities. Includes formation 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. F

430. International Financial Management. 3 credits. Prerequisites: Fin 310 and Junior or Senior Standing; declared CoBPA majors only. Financial management implications of exchange risk exposure, accounting conventions and international constraints on capital flows. Other topics include multi-national investment management and international capital management. F

440. Valuing Real Assets and Financial Strategy. 3 credits. Prerequisites: Fin 340 and 360; declared CoBPA majors only. This course addresses a variety of issues related to valuing real assets, with a large emphasis on using real option valuation techniques. Students are required to use Real Options Toolkit Analysis, and SPSS (cutting edge software packages) in a variety of projects and case studies. There is additional emphasis on using real data, such as for-
The Forensic Science curriculum is divided into two tracks, Evidence Technician and Evidence Analyst.

The Evidence Technician track is recommended for those interested in law enforcement careers involving evidence processing at crime scenes and only limited laboratory analysis. Students interested in acquiring a background in scientific analysis of evidence as a supplement to another major may prefer this track.

The Evidence Analyst track is recommended for those who desire a career in forensic laboratory analysis and access to careers that require similar analytical skills. Students interested in pursuing simultaneous science majors may also prefer this track. This track has a biology and molecular biology emphasis; students interested in chemistry should talk to the program director about course substitutions.

Admission requirements: Students may declare either track of the Forensic Science major at any time after admission to the University, provided that he or she has an overall grade point average (GPA) of 2.2 or higher. After joining the program, a 2.2 GPA must be maintained in the major and overall. Failure to maintain the appropriate GPA for two consecutive semesters will result in dismissal from the program.

College of Arts and Sciences

B.S. WITH A MAJOR IN FORENSIC SCIENCE

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

I. General Education Requirements (see University GER listing).
II. Evidence Technician Track: the following curriculum:

69 Major Credits including:

Required Courses (60 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 345</td>
<td>Forensic Science</td>
<td>(3)</td>
</tr>
<tr>
<td>ANTH 346</td>
<td>Analysis of Forensic Evidence</td>
<td>(3)</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>(3)</td>
</tr>
<tr>
<td>CJ 201</td>
<td>Introduction to Criminal Justice</td>
<td>(3)</td>
</tr>
<tr>
<td>CJ 210</td>
<td>Introduction to Policing</td>
<td>(3)</td>
</tr>
<tr>
<td>CJ 352</td>
<td>Criminal Investigation</td>
<td>(3)</td>
</tr>
<tr>
<td>CJ 353</td>
<td>Law for Criminal Justice System</td>
<td>(3)</td>
</tr>
<tr>
<td>BIOL 150/150L</td>
<td>General Biology I &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>BIOL 151/151L</td>
<td>General Biology II &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>CHEM 121/122</td>
<td>General Chemistry I &amp; II</td>
<td>(6)</td>
</tr>
<tr>
<td>CHEM 121L/122L</td>
<td>Survey of Organic Chemistry &amp; Lab</td>
<td>(5)</td>
</tr>
<tr>
<td>CHEM 333</td>
<td>Introductory Environmental, Clinical, and Forensic Chemistry</td>
<td>(4)</td>
</tr>
<tr>
<td>PHYS 161/161L</td>
<td>Introductory College Physics I &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>PHYS 162/162L</td>
<td>Introductory College Physics II &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>3 credits from:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BIOL 470                Biometry</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>SOC 326                Sociological Statistics</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>3 credits from:</td>
<td></td>
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<tr>
<td></td>
<td>PHIL 215                Contemporary Moral Issues</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>PHIL 370                Ethics in Engineering and Science</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>PHIL 372                Ethics in Health Care</td>
<td>(3)</td>
</tr>
</tbody>
</table>

ELECTIVES (9 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramed Personnel</td>
<td>(3)</td>
</tr>
<tr>
<td>ANTH 270</td>
<td>Introduction to Forensic Anthropology</td>
<td>(3)</td>
</tr>
<tr>
<td>ANTH 439</td>
<td>Human Osteology</td>
<td>(4)</td>
</tr>
<tr>
<td>ANTH 441</td>
<td>Forensic Anthropology Field School</td>
<td>(1-6)</td>
</tr>
<tr>
<td>ANTH 497</td>
<td>Forensic Science Internship</td>
<td>(1-12)</td>
</tr>
<tr>
<td>BIOL 315</td>
<td>Genetics</td>
<td>(3)</td>
</tr>
<tr>
<td>BIOL 336</td>
<td>Systematic Botany</td>
<td>(4)</td>
</tr>
<tr>
<td>BIOL 363</td>
<td>Entomology</td>
<td>(4)</td>
</tr>
<tr>
<td>PSYC 270</td>
<td>Abnormal Psychology</td>
<td>(3)</td>
</tr>
</tbody>
</table>

III. Evidence Analyst Track: the following curriculum:

95 Major Credits including:

Required Courses (96 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 345</td>
<td>Forensic Science</td>
<td>(3)</td>
</tr>
<tr>
<td>ANTH 346</td>
<td>Analysis of Forensic Evidence</td>
<td>(3)</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td>(3)</td>
</tr>
<tr>
<td>CJ 201</td>
<td>Introduction to Criminal Justice</td>
<td>(3)</td>
</tr>
<tr>
<td>CJ 210</td>
<td>Introduction to Policing</td>
<td>(3)</td>
</tr>
<tr>
<td>CJ 352</td>
<td>Criminal Investigation</td>
<td>(3)</td>
</tr>
<tr>
<td>CJ 353</td>
<td>Law for Criminal Justice System</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Fine Arts (FA)

Courses

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
BIOL 150/150L General Biology I & Lab (4)
BIOL 151/151L General Biology II & Lab (4)
BIOL 315 Genetics (3)
BIOL 333 Population Biology (3)
BIOL 410 Molecular Biology Techniques (4)
BMB 301 Biochemistry and Molecular Biology (3)
CHEM 121/121L General Chemistry I & Lab (4)
CHEM 122/122L General Chemistry II & Lab (4)
CHEM 333 Introductory Environmental, Clinical, and Forensic Chemical Analysis (4)
CHEM 341/341L Organic Chemistry I & Lab (5)
CHEM 342/342L Organic Chemistry II & Lab (5)
MATH 165 Calculus I (4)
MATH 166 Calculus II (4)
3 credits from:
BIOL 470 Biometry (3)
SOC 326 Sociological Statistics (3)
3 credits from:
PHIL 215 Contemporary Moral Issues (3)
PHIL 370 Ethics in Engineering and Science (3)
PHIL 372 Ethics in Health Care (3)
8 credits from:
PHYS 161/161L Introductory College Physics I & Lab (4)
PHYS 162/162L Introductory College Physics II & Lab (4)
OR
PHYS 211/211L College Physics I & Lab (4)
PHYS 212/212L College Physics II & Lab (4)
ELECTIVES (9 credits):
ANAT 204 Anatomy for Paramed Personnel (3)
ANTH 270 Introduction to Forensic Anthropology (3)
ANTH 439 Human Osteology (4)
ANTH 441 Forensic Anthropology Field School (1-6)
ANTH 497 Forensic Science Internship (1-12)
Biol 336 Systematic Botany (4)
BIOL 363 Entomology (4)
PSYC 270 Abnormal Psychology (3)
CLS 301 Immunology (2)

Geography

Hansen, Munski, Rundquist, Todhunter (Chair), Vandeberg and Wang

The Department of Geography offers major and minor programs in the College of Arts and Sciences. The principal programs of study include human geography, physical geography, geographic education and geographic techniques. The undergraduate specialization in community and urban development provides the background education and training necessary for students to enter the field of rural and urban development. The undergraduate specialization in environmental geography prepares students for a career in environmental management. The undergraduate major provides a broad liberal arts education and prepares students for graduate study or for a professional career in government, industry, or education in a wide variety of fields related to urban and regional planning, economic development, environmental management, mapping, geographic information systems, or geographic education.

The Geography minor is flexible and allows students to take related coursework in anthropology, atmospheric science, aviation, biology, business, communications, education, geology, history, international business, meteorology, public administration, recreation and leisure studies, sociology or space studies.

The Department of Geography has a modern computer laboratory for work related to geographic information systems, remote sensing, digital image processing, computer-assisted mapping, air photo interpretation, quantitative methods, spatial analysis and field methods. It also maintains a Census Data Center for information related to the Northern Plains.

College of Arts and Sciences

B.S. WITH A MAJOR IN GEOGRAPHY

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

I. General Education Requirements (see University GER listing).

II. The following core curriculum courses for A, B, and C options (19 credits):

Geog 121/L Global Physical Environment/Lab (4)
Geog 151 Human Geography (3)
Geog 161 World Regional Geography (3)
Geog 377/L Quantitative Applications in Geography/Lab (3)
Geog 471/L Cartography and Computer-Assisted Mapping/Lab (3)
Geog 474/L Introduction to Geographic Information Systems (3)

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, and tourism. Required systematic courses (9 credits):

Geog 352 Economic Geography (3)
Geog 457 Urban Geography and Planning (3)
Geog 458 Community Development (3)

Elective topical courses (8 credits) from:

Geog 262 Geography of North America I (3)
Geog 263 Geography of North Dakota (3)
Geog 300 Special Topics in Geography (1-3)
Geog 354 Conservation of Resources (3)
Geog 497 Cooperative Education (3)
Geog 452 Selected Topics in Economic Geography (3-9)
Geog 453 Historical Geography (3)
Geog 455 Geopolitics (3)
Geog 463 Regional Geography (2-3)

Recommended in other departments (12 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 environmentally-related fields. Required systematic courses (at least 11 credits):

Geog 134/L Introduction to Global Climate/Lab (4)
Geog 334/L Climatology/Lab (4)
Geog 322 Environmental Hazards (3)
Geog 354 Conservation of Resources (3)
Geog 421/L Selected Topics in Physical Geography (3-9)

Elective technical courses (6 credits):

Geog 279/L Map Use and Interpretation (3)
Geog 300 Special Topics in Geography (1-3)
Geog 374/L Environmental Remote Sensing & Air Photo Interpretation (3)
Geog 378/G Global Positioning Systems: Applications & Theory (2)
Geog 497 Cooperative Education (3-9)
Geog 475/L Digital Image Processing (3)

Required in other departments (12 credits):

Any combination of courses from the following fields: Atmospheric Science, Biology, Chemistry, Computer Science, Geology, 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. General Education Requirements (see University GER listing).

II. Geographic Education Program of Study:

A. Geographic Education Core (26 credits):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geog 121/L</td>
<td>Global Physical Environment/Lab</td>
<td>4</td>
</tr>
<tr>
<td>Geog 151</td>
<td>Human Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 161</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 271</td>
<td>Map Use and Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>Geog 352</td>
<td>Economic Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 354</td>
<td>Conservation of Resources</td>
<td>3</td>
</tr>
<tr>
<td>Geog 377/L</td>
<td>Quantitative Applications in Geog/Lab</td>
<td>3</td>
</tr>
<tr>
<td>Geog 386</td>
<td>Geographic Education Field Placement</td>
<td>1</td>
</tr>
<tr>
<td>Geog 419</td>
<td>Methods &amp; Materials in Geographic Educ.</td>
<td>3</td>
</tr>
</tbody>
</table>

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 advisor responsible for teacher education.

1. Human Geography:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geog 300</td>
<td>Special Topics in Geography</td>
<td>1-3</td>
</tr>
<tr>
<td>Geog 452</td>
<td>Selected Topics in Economic Geography</td>
<td>3-9</td>
</tr>
<tr>
<td>Geog 453</td>
<td>Historical Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 455</td>
<td>Geopolitics</td>
<td>3</td>
</tr>
<tr>
<td>Geog 457</td>
<td>Urban Geography and Planning</td>
<td>3</td>
</tr>
<tr>
<td>Geog 458</td>
<td>Community Development</td>
<td>3</td>
</tr>
</tbody>
</table>

2. Physical Geography:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Geog 134/L</td>
<td>Introduction to Global Climate/Lab</td>
<td>3</td>
</tr>
<tr>
<td>Geog 300</td>
<td>Special Topics in Geography</td>
<td>1-3</td>
</tr>
<tr>
<td>Geog 322</td>
<td>Environmental Hazards</td>
<td>3</td>
</tr>
<tr>
<td>Geog 334</td>
<td>Climatology</td>
<td>4</td>
</tr>
<tr>
<td>Geog 421</td>
<td>Selected Topics in Physical Geography</td>
<td>3-9</td>
</tr>
</tbody>
</table>

3. Regional Geography:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geog 262</td>
<td>Geography of North America I</td>
<td>3</td>
</tr>
<tr>
<td>Geog 263</td>
<td>Geography of North Dakota</td>
<td>3</td>
</tr>
<tr>
<td>Geog 362</td>
<td>Geography of Canada</td>
<td>3</td>
</tr>
<tr>
<td>Geog 462</td>
<td>Geography of North America II</td>
<td>3</td>
</tr>
<tr>
<td>Geog 463</td>
<td>Regional Geography: Middle East</td>
<td>3</td>
</tr>
<tr>
<td>Geog 463</td>
<td>Regional Geography: Europe</td>
<td>3</td>
</tr>
</tbody>
</table>

4. Geographical Techniques:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geog 300</td>
<td>Special Topics in Geography</td>
<td>1-3</td>
</tr>
<tr>
<td>Geog 374/L</td>
<td>Environmental Remote Sensed</td>
<td>3</td>
</tr>
<tr>
<td>Geog 378</td>
<td>Global Positioning Systems</td>
<td>2</td>
</tr>
<tr>
<td>Geog 471/L</td>
<td>Cartography and Computer-Assisted Mapping/Lab</td>
<td>3</td>
</tr>
<tr>
<td>Geog 474/L</td>
<td>Introduction to GIS</td>
<td>3</td>
</tr>
</tbody>
</table>

III. Admission to the Secondary Program, normally while taking T&L 325. (See College of Education and Human Development for admission and licensing requirements.)

IV. The program in Secondary Education, to include:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 325</td>
<td>Exploring Teaching in Secondary Schools</td>
<td>3</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 Adolescents</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 386</td>
<td>Field Experience (Optional)</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 390</td>
<td>Special Topics</td>
<td>1-3</td>
</tr>
<tr>
<td>Geog 419</td>
<td>Methods and Materials of Teaching Middle and Secondary School Geographic Education</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 460</td>
<td>Microteaching</td>
<td>2</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>A full semester of student teaching, normally taken during the semester of graduation</td>
<td>16</td>
</tr>
<tr>
<td>T&amp;L 488</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

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

MINOR IN GEOGRAPHY

Required 20 credits including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geog 121/L</td>
<td>Global Physical Environment/Lab</td>
<td>4</td>
</tr>
<tr>
<td>Geog 151</td>
<td>Human Geography</td>
<td>3</td>
</tr>
<tr>
<td>Geog 161</td>
<td>World Regional Geography</td>
<td>3</td>
</tr>
<tr>
<td>Electives in Geography</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

Students must choose a minimum of 10 credits from one or a combination of the following concentrations, selected with approval of a geography advisor.

Courses

The geography courses that may be used to satisfy the 4-credit General Education laboratory science requirement are Geography 121 and 134. Geography 121 is a 3-credit course that may be used to satisfy the 9-credit General Education science requirement include: Geography 151, 161 and 262.

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

121L. Global Physical Environment Laboratory, 1 credit. A basic environmental science laboratory complement to Geography 121. F,S,SS

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

134L. Introduction to Global Climate Laboratory, 1 credit. Prerequisite or corequisite: Geog 134. A basic physical science laboratory focused upon specific atmospheric-climatic phenomenon; wet and dry lab experiments, plus written lab exercises.

151. Human Geography, 3 credits. A systematic analysis of people’s cultural regions including settlement patterns and change via migration and diffusion. F

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

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 nations-states and deal with a global economy. S

263. Geography of North Dakota, 3 credits. Study of the interrelationships that exist between North Dakota’s physical and cultural environments. Specific topics include physiography, climate, flora, prehistoric occupation, historic development, demography, and economic structures. S

271. Map Use and Interpretation, 3 credits. Map Use and Interpretation will cover basic map elements like map scale and projection, and introduce students to the design and construction techniques of thematic maps. It will give students an understanding of maps and their usefulness, and it will also serve as the foundation course for further study of cartography. S

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

319. Geography for Teachers, 2 credits. Geographical concepts and basic philosophy including a survey of the literature which forms the basis for analysis and application of current techniques in the field of geography. F, S

319L. Geography for Teachers Lab, 1 credit. Prerequisite: Undergraduates pursing licensure for teaching social studies or for teaching geography, or by instructor permission. Corequisite: Geog 319. Applications of map reading and interpretation with emphasis upon geospatial technologies specific to K-12 classrooms with emphasis upon laboratory work and field site visits to local schools to practice those skills and techniques in appropriate educational settings. F

322. Environmental Hazards, 3 credits. Prerequisites: Geog 121 and 161 or consent of instructor. An overview of the field of environmental hazards emphasizing risk assessment, hazard impact, human vulnerability, and hazard mitigation. F

334. Climatology, 4 credits. Prerequisite: Geog 134 or AtSc 110. An overview of the field of climatology, emphasizing surface transfers of energy and water, the general circulation of the atmosphere, and climate change. Includes a weekly laboratory. S

352. Economic Geography, 3 credits. Prerequisites: Sophomore standing or consent of instructor. 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 used to develop spatial structure. Classes may be conducted over Interactive Video Network (IVN). F

354. Conservation of Resources, 3 credits. Geographic principles applied to the analysis of resources and their efficient utilization. Emphasis is on properly balanced development. F

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

374. Environmental Remote Sensing and Air Photo Interpretation, 2 credits. Corequisite: Geog 374L. 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. F

374L. Environmental Remote Sensing and Air Photo Interpretation Laboratory, 1 credit. Corequisite: Geog 374. A systematic coverage of visual and digital laboratory techniques used to interpret aerial photography and satellite imagery. Students gain hands-on experience assessing environmental problems using remotely sensed data. F
377. Quantitative Applications in Geography. 2 credits. Prerequisite: Math 103 or consent of instructor. Application of statistical and mathematical techniques to research topics in geography. F

377L. Spatial Analysis Laboratory. 1 credit. Prerequisite: Math 103. Corequisite: Geog 377. 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. F

378. Global Positioning Systems: Applications and Theory. 2 credits. This course introduces the principles, 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

386. GEOG ED Field Placement. 1-3 credits. Prerequisites: Geography major or minor or Teaching & Learning major or consent of the supervising faculty member. 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/middle school social studies majors concerned about how federal legislation is affecting teaching grades K-8. F,S, and/or SS.

397. Cooperative Education. 1-6 credits. May be repeated to a maximum of 6 credits. Prerequisite: 60 credits completed, minimum G.P.A. of 2.75. A practical work experience with an employer closely associated with geography. S-U grading only. F,SS

419. Methods and Materials of Teaching Middle and Secondary School in Geographic Education. 3 credits. Prerequisite: T&L 325 and T&L 345. Corequisite: T&L 486. Various teaching methods, strategies and the materials used in teaching middle and secondary school geography education. S

421. Selected Topics in Physical Geography. 3 credits. Prerequisites: Geog 121, or consent of instructor. An examination of an advanced physical geography topic chosen from field methods, environmental history, soils-biogeography, or others. Repeatable to nine credits if different topics are examined. S

425. Selected Topics in Economic Geography. 3 credits. Prerequisites: Geog 151 or consent of instructor. 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. S. On demand.

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. SS. On demand.

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. On demand.

457. Urban Geography and Planning. 3 credits. An analysis of urban settlement patterns and the spatial interaction involved in intra-city, inter-city, and city hinterland relationships including current urban geography theory and urban planning. S

459. Community Development. 3 credits. Corequisite: Geog 151 or consent of instructor. 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 state wide scale of study. F

462. Geography of North America II. 3 credits. Prerequisite: Geog 262 or consent of instructor. 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. On demand.

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. S

471. Cartography and Computer-Assisted Mapping. 2 credits. Corequisite: Geog 471L. Principles of graphic communication and skills for producing maps and charts using computer technology. It involves creating both geographic and attribute databases for graphic display of points, lines, areas, and surfaces. Data analysis, cartographic techniques, history of cartography, and projections are also discussed. F

471L. Computer Mapping Laboratory. 1 credit. Corequisite: Geog 471. Knowledge of computer operating systems and competence to use various mapping software packages to produce accurate and aesthetically pleasing maps and charts. Students implement projects and organize their finished products into a portfolio for presentation. F

474. Introduction to Geographic Information Systems (GIS). 2 credits. Prerequisites: Geog 471 and 471L or equivalent or instructor consent. Corequisites: Geog 474L. 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. F, S

474L. GIS Laboratory. 1 credit. Corequisite: Geog 474. Hands-on application of theory and methods associated with digital spatial data representation, manipulation, and analysis. F,S

475. Digital Image Processing. 3 credits. Prerequisite: Geog 374 and 374L. A course focused on the concepts and principles involved in the use of digital remotely sensed images 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. S

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

497. Geography Internship. 1-3 credits. Prerequisite: Geography major or minor or consent of the supervising faculty member. A variable credit course with amount of credit depending upon the extent of the work of a geographical nature being performed as an unpaid volunteer to a PVO, NGO, youth organization, service organization or other not-for-pay jobs either on campus or off campus.

Geology and Geological Engineering (Geol and GeoE)

Forsman, Gerla, Ghassemi, Gosnold (Chair), Groenewold, Hartman, Josephs, Korom, LeFever, Matheney, Perkins and Zeng

The Department of Geology and Geological Engineering offers Bachelor of Science degrees in Geology, Geological Engineering, and Environmental Geoscience, the Master of Arts and Master of Science degrees in Geology, the Master of Science degree in Geological Engineering, and the Doctor of Philosophy degree in Geology. The goals of the undergraduate programs are to provide professional preparation for majors in the geosciences and engineering and to provide guidance to non-majors seeking to gain a greater understanding of Earth and planetary environments and resources. Four active student organizations, Sigma Gamma Epsilon (the national earth science honorary society), The Association of Engineering Geologists, The Association of Undergraduate Geologists, and INGEOS (Indians into Geosciences) provide academic and social opportunities for students including: guest speakers, field trips, research experience, scholarships, and thesis research support.

Facilities

The Department 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 hydrogeology, geophysics, stratigraphy, paleontology, mineralogy, petrology, and geological engineering. The North Dakota Geological Survey’s 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 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 web site at www.goegy.und.edu.

UNDERGRADUATE PROGRAMS

Four degrees are offered: the Bachelor of Science in Geology and the Bachelor of Arts with a Major in Geology in the College of Arts and Sciences, and the Bachelor of Science in Geological Engineering and the Bachelor of Science in Environmental Geoscience in the School of Engineering and Mines.

College of Arts and Sciences

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. General Education Requirements (see University GER listing)

II. The Following Curriculum: 48-49 major hours, including:

- Geography and Geological Engineering
- B.S. in Geology
### MINOR IN GEOLOGY

Required: 20 credits including:

- Math 103, 265, 321 (4 credits)
- Geol 101, 103, 311, 422 (24 credits)

### School of Engineering and Mines

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, 3) hydrogeology, 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 action of the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Courses in the curriculum are arranged and integrated to provide the student with progressive preparation for engineering evaluation and design. To facilitate the transition from student to professional, the senior year has a capstone experience that incorporates student creativity and sociological and engineering criteria into a major design project.

As the demand for mineral, energy, and water resources increases and population growth and urbanization place a greater strain on the environment, the nation and world will need engineers with a thorough knowledge of geologic materials, processes, and history. The goal of the geological engineering program at the University of North Dakota is to provide students with the engineering skills and geological expertise necessary to assure that geological, social, and environmental factors are incorporated in the design, construction, operation, and maintenance of engineered structures and systems within their natural setting. Through its strong environmental emphasis, the department strives to develop in its engineering graduates keen insight and abilities to design an environmentally sound and sustainable future for humanity.

To achieve this goal, the department has the following objectives for its engineering graduates:

1. Program graduates shall have attained sufficient proficiency to practice geological engineering in at least one of the areas of exploration and production of mineral and energy resources, geomechanics, hydrogeology, reclamation, or site assessment/remediation.
2. Program graduates shall have the ability to competently perform a wide range of design tasks in at least one of the areas
of exploration and production of mineral and energy resources, geomechanics, hydrogeology, reclamation, or site assessment/remediation.

3. Program graduates shall have attained sufficient proficiency in discipline-related areas such as mathematics, physical sciences, social sciences, and arts and humanities to enable them to understand technical and nontechnical issues related to the practice of engineering.

4. Program graduates shall be skilled in written, verbal and media-based communication, working in multi-disciplinary teams, geoscience and engineering workstation methods, and research methods.

5. Program graduates shall be prepared to enter a graduate program in geological engineering or geology if they so desire.

**B.S. IN GEOLOGICAL ENGINEERING**

Required: 12 credits including:

I. General Education Requirements (see University GER listing).

II. The Following Curriculum:

#### Freshman Year

<table>
<thead>
<tr>
<th>Courses</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 165: Calculus I</td>
<td>(4 credits)</td>
<td></td>
</tr>
<tr>
<td>Chem 121: General Chemistry I, Lab</td>
<td>(4 credits)</td>
<td></td>
</tr>
<tr>
<td>Engl 110: Composition I</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 203: Geology for Engineers.</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 318: Mineralogy</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Math 166: Calculus II</td>
<td>(4 credits)</td>
<td></td>
</tr>
<tr>
<td>Chem 122, 122L: General Chemistry II, Lab</td>
<td>(4 credits)</td>
<td></td>
</tr>
<tr>
<td>Phys 251/251L: University Physics I</td>
<td>(4 credits)</td>
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#### Sophomore Year

<table>
<thead>
<tr>
<th>Courses</th>
<th>First Semester</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Math 265: Calculus III</td>
<td>(4 credits)</td>
<td></td>
</tr>
<tr>
<td>Phys 252: University Physics II</td>
<td>(4 credits)</td>
<td></td>
</tr>
<tr>
<td>Engr 200: Computer Applications in Engineering</td>
<td>(2 credits)</td>
<td></td>
</tr>
<tr>
<td>Engr 201: Statics</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 320: Petrology</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Social Science</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>EE 206: Circuit Analysis</td>
<td>(3 credits)</td>
<td></td>
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<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engr 202: Dynamics</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Econ 201: Principles of Economics I</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Engl 125: Technical and Business Writing</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 323: Engineering Geology</td>
<td>(2 credits)</td>
<td></td>
</tr>
<tr>
<td>Math 266: Introduction to Differential Equations</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>(3 credits)</td>
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</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Courses</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engr 203: Mechanics of Materials</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Engr 306: Fluid Mechanics</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>ME 341: Thermodynamics</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Communication Elective</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Statistics Elective (Econ 210, Psy 241, or Math 321)</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 411: Sedimentology &amp; Stratigraphy</td>
<td>(5 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 330: Structural Geology</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>CEn 412: Soil Mechanics</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Technical Elective*</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>(3 credits)</td>
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</tbody>
</table>

#### Summer

Field Geology (South Dakota School of Mines and Technology Black Hills Field Station) (6 credits)

#### Senior Year

<table>
<thead>
<tr>
<th>Courses</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol 340: Applied Geophysics</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>CH 340: The Role of Engineers</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>or Phil 370: Ethics in Engineering</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 417: Hydrogeology</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 455: Geomechanics</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 484: Geological Engineering Design</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Engr 460: Engineering Economy</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 485: Geological Engineering Design</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Geol 422: Seminar II</td>
<td>(1 credit)</td>
<td></td>
</tr>
<tr>
<td>Social Science</td>
<td>(3 credits)</td>
<td></td>
</tr>
<tr>
<td>Technical Elective*</td>
<td>(3 credits)</td>
<td></td>
</tr>
</tbody>
</table>

* Technical Electives: 6 credits required from courses approved by Geological Engineering Curriculum Committee.

**B.S. IN ENVIRONMENTAL GEOSCIENCE**

Required 125 credits, including:

I. General Education Requirements (see University GER listing).

II. The following Core Curriculum

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol 101, 101L: Introduction to Geology and Laboratory</td>
<td>(4 credits)</td>
</tr>
<tr>
<td>Geol 102, 102L: The Earth Through Time and Laboratory</td>
<td>(4 credits)</td>
</tr>
<tr>
<td>Geol 220: Computer Applications in Geology and Environmental Science</td>
<td>(4 credits)</td>
</tr>
<tr>
<td>Geol 311: Geomorphology</td>
<td>(3 credits)</td>
</tr>
<tr>
<td>Geol 318: Mineralogy</td>
<td>(3 credits)</td>
</tr>
<tr>
<td>Geol 321: Geochemistry</td>
<td>(3 credits)</td>
</tr>
<tr>
<td>Geol 322: Geology, Society and the Environment</td>
<td>(3 credits)</td>
</tr>
<tr>
<td>Geol 340: Digital Mapping Methods</td>
<td>(3 credits)</td>
</tr>
<tr>
<td>Geol 342: Environmental and Conservation Hydrology</td>
<td>(3 credits)</td>
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<tr>
<td>Geol 356: Geoscience Lectures</td>
<td>(1 credit)</td>
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<tr>
<td>Geol 410: Site Characterization</td>
<td>(3 credits)</td>
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<tr>
<td>Geol 414: Applied Geophysics</td>
<td>(3 credits)</td>
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<tr>
<td>Geol 421: Seminar I</td>
<td>(1 credit)</td>
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<td>Geol 422: Seminar II</td>
<td>(1 credit)</td>
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<tr>
<td>Geol 487: Research I</td>
<td>(3 credits)</td>
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<tr>
<td>Geol 498: Research I</td>
<td>(2 credits)</td>
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<tr>
<td>Geol 494: Senior Thesis</td>
<td>(1 credit)</td>
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Required in Other Departments:

- Biol 150, 150L: General Biology I, Laboratory (4 credits)
- Biol 151, 151L: General Biology II, Laboratory (4 credits)
- Chem 121, 121L: General Chemistry I, Laboratory (4 credits)
- Chem 122, 122L: General Chemistry II, Laboratory (4 credits)
- Math 165: Calculus I (4 credits)
- Math 166: Calculus II (or approved statistics course) (4 credits)
- Phys 251, 251L: University Physics I, Laboratory (4 credits)
- Program Electives (three courses from following) (8-10 cr.):
  - Biol 431: Wildlife Management (3 credits)
  - Biol 433: Aquatic Ecology (3 credits)
  - Chem 333: Introductory Environmental, Clinical, and Forensic Chemical Analysis (3 credits)
  - Geol 417: Hydrogeology (3 credits)
  - Geol 418: Hydrogeological Methods (2 credits)
  - Geol 419: Groundwater Monitoring and Remediation (3 credits)
  - Geoe 475: Digital Image Processing (3 credits)
  - Law 263: Environmental Law (3 credits)
  - SpSp 430: Earth System Science (3 credits)

#### Courses

For Geology majors, a grade of C or better is required in Geology 318 before any other 300 or 400 numbered courses are taken.

**101. Introduction to Geology. 3 credits.** Introduction to the dynamics of the Earth—volcanoes, earthquakes, plate tectonics, streams, groundwater, glaciers, waves, wind, and landslides, with emphasis on the environmental applications of these processes. Introduction to the tools of the geologist—minerals, rocks, maps, and aerial photographs. Geol 101L may be taken concurrently. F,S, SS

**101L. Introduction to Geology Laboratory. 1 credit.** Prerequisite or corequisite: Geol 101. An introductory laboratory to complement Geol 101. Field trip(s) included. F,S,SS

**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

**102L. The Earth Through Time Laboratory. 1 credit.** Prerequisite or corequisite: Geol 102. An introductory laboratory to complement Geol 102. Field trip included. F,S

**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

**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.

**105. Selected Topics. 1-4 credits.** Repeatable when topics vary. 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. On demand.

**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 cratering, meteorites, the sun, the solar system’s origin, planetary atmospheres, the living Earth, the question of life elsewhere. F,S

**111R. Views of the Earth and Planets Recitation. 1 credit.** Corequisite: Geol 111. A recitation-discussion to complement Geol 111. S

**203 (Geoe). Geology for Engineers. 3 credits.** Corequisites: Geoe 203L. Physical geology discussed from the engineering point of view. Required of students in civil engineering and geological engineering. Includes laboratory. F
contamination. F

of instructor. Physical and chemical aspects of groundwater movement, supply, and

ations of stratigraphy. Includes field trip and laboratory. S

gin, transportation, deposition, and diagenesis of sediments; principles and applica-

niques at real sites. F

more semesters. Arranged by mutual agreement among student, department, and employer.

with the student’s academic area. Positions may require student relocation for one or

ogy and technology. A practical work experience with an employer closely associated

qualified students majoring in geological engineering, geology, or environmental geol-

of the extraneous and nuisance factors. S

hydrogeologic problems. Origin and distribution of the chemical elements. Introduc-

tery geology course or upper division standing; Math 103 recommended. Relationship of geol-

ftion to radiochemistry, isotopic geochronology, and stable-isotope geochemistry. S

continents, or both. Application of the principles of fluid transport to subsurface pheno-

ography. Includes laboratory and field trip. S

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

1. Reclamation Engineering. 3 credits. Prerequisites: Geology 101 or Geol 203 or consent of adviser. Principles of reclamation emphasizing: the need for reclamation of degraded lands, preservation of ecosystems, and biological diversity. S

237. Introduction to Paleontology. 4 credits. Prerequisites: Geol 101 and 102. Dynamics of weathering, erosion, wind, water, groundwater, waves, wind and ice in the production of landforms. Includes field trips and laboratory. F

311. Geomorphology. 4 credits. Includes Geol 101 and 102. Dynamics of weathering, erosion, wind, water, groundwater, waves, wind and ice in the production of landforms. Includes field trips and laboratory. F

380. Petrology. 3 credits. Prerequisite: Geol 318. 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 mineral- 

ology. Includes laboratory. F

331. Geophysical Methods. 3 credits. Prerequisites: Geol 318, Chem 122 and Math 166, or consent of instructor. 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. S

325 (GeoE). Engineering Geology, 2 credits. Prerequisites: One introductory geology course, Math 165, and upper division standing in geology or engineering. Application of geological and environmental principles to geotechnical engineering design, construction, and operation. On demand, offered alternate years.

320. Structural Geology. 3 credits. Prerequisites: Geol 318, Geol 320, and Math 105. Mechanics of rock deformation, analysis of rock structures, preparation and inter-

pretation of geologic maps and cross sections showing structural and tectonic features. Includes laboratory. S

346. Geoscience Lectures. 1 credit. Students attend and evaluate departmental lectures given by visiting scientists and engineers. Includes local and global hydrological cycle, flood occurrence and prediction, water pollution, erosion and sedi-

mentation, wetlands, and water management. S/Z

356. Geoscientific Engineering Design. 3 credits. Prerequisite: Geol 101 or Geol 203, and Geol 102. Origin, accumulation and geologic occurrence of petroleum and gas. F/Z (odd numbered years).

410. Site Characterization. 3 credits. Prerequisites: Geol 220, 311, 414; Biol 332, 332L. Purposes, techniques, and tools of site investigation. Covers geologic, hydrologic, and ecologic concerns. Hands-on application of principles, tools and techniques at real sites. F

411. Sedimentology and Stratigraphy. 3 credits. Prerequisite: Geol 320. Origin, transportation, deposition and diagenesis of sediments; principles and applica-

ations of stratigraphy. Includes field trip and laboratory. S

414. Applied Geophysics, 3 credits. Prerequisites: Geol 101, Math 265, Phys 212 or 252. Principles of various geophysical methods and their application to geo-

logic problems. F

415. Introduction to Paleontology. 4 credits. Prerequisite: Geol 102. Recom-
mended: Biol 150, 151. 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 trips and laboratory. F

417 (GeoE/Geol). Hydrogeology, 3 credits. Prerequisite: Math 166 or consent of instructor. Physical and chemical aspects of groundwater movement, supply, and contamination. F

418 (GeoE/Geol). Hydrogeological Methods, 2 credits. Corequisites: Geol/GeoE 417. 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. F

419 (GeoE). Groundwater Monitoring and Remediation. 3 credits. Prerequisites: Math 166, Geo/Geol 417 and a statistics course (Econ 219, Psy 241, Math 321 or 353) or consent of instructor. Statistical methods for groundwater sampling and moni-
toring network design. Groundwater remediation and design; including strategies that remove contaminants for external treatment and strategies for in-situ contaminant treat-

420. The Evolving Earth. 3 credits. Prerequisite: Senior standing in Geology. A synthesis of the physical, biological, and chemical changes on Earth through time set within geologic systems and unifying concepts.

421. Seminar I. 1 credit. Prerequisite: Geol 356. 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 presen-
tations and departmental guest lectures. FS

422. Seminar II. 1 credit. Prerequisites: Geol 421, senior or graduate status in departmental major. 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. FS

425 (GeoE). Design Hydrology for Wetlands. 3 credits. Prerequisites: Chem 121 and either CE/ME 306 or Geo/Geol 417. Principles of chemistry, geology, hydraulics, and hydrology applied to natural and constructed wetlands and other small catchments. S

427 (GeoE). Groundwater Modeling. 3 credits. Prerequisites: GeoE 417. Math 265; some programming experience recommended. Fundamentals of numerical modeling applied to groundwater systems. A portion of this course 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. F

430 (GeoE). Thematic Geosciences. 4 credits. Prerequisites: Geol 323 and GeoE 412 or consent of instructor. Principles of geomatics and its application to geological engineering. Includes laboratory. F

484 (GeoE). Geologic Engineering Design. 3 credits. Prerequisites: Advanced level standing in Geologic Engineering and consent of adviser. The first of a two-course sequence in geologic engineering design. Define the design problem, establish design objectives, evaluate alternatives, specify constraints, determine a methodology, complete a formal design problem statement. F/SS

485 (GeoE). Geological Engineering Design. 3 credits. Prerequisite: GeoE 484. Corequisite: Geol 422. Continuation of GeoE 484 taken the preceding semester. Systematic design and system designpcos, with a focus on feasibility, careful assessment of economic factors, safety, reliability, aesthetics, ethics, and social and environmental impact. Results presented in Geo 422 Seminar. F/S,SS

487. Research I. 1 credit. Prerequisite: Senior standing in departmental major. 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. F/S

488. Research II. 2 credits. Prerequisite: Geol 487. Execution of research plan developed in Geo 487. F/S

491. Geologic Problems. 1-4 credits. Prerequisites: Consent of instructor. May be taken more than one semester to maximum of 8 hours. Individualized or group study on selected geoscience topics. F/SS

493 (GeoE). Selected Topics on Mining. 1-3 credits (repeatable to maximum of 4 courses). Prerequisite: Geol 301. Detailed study of a selected topic related to mine plan-
ing or mining engineering. Includes literature review, and discussions with faculty, and students required. On demand. F

494. Senior Thesis. 1 credit. Prerequisite or corequisite: Geol 488. Written re-
sults of research conducted in Geol 489. The thesis document should conform to the formal 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, FSU/University of North Dakota.

History
Berger, Broedel, Burin, Caraher, Isemingler, Kelsch, Mochoruk, Porter (Chair) and Reese

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. Beyond this, the depart-

ment prepares students for the teaching of history at all levels, govern-

ment service, and graduate studies in history. The study of history may 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 government service, business, or teaching at the secondary level.

University of North Dakota
When taken in conjunction with the Teaching and Learning program in Secondary Education, Option B satisfies the requirements for teacher certification in the Social Sciences. 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. General Education Requirements (see University GER listing).
II. One of the following curriculum options:

Option A
36 major hours, including:
9 hours from:

Hist 101Western Civilization I ............................................. (3)
Hist 102Western Civilization II............................................. (3)
Hist 103United States to 1877 ............................................ (3)
Hist 104United States since 1877 .................................... (3)
Hist 240The Historian's Craft ........................................ (3)
Hist 440Research ...................................................... (3)
Electives (15 must be upper level) ................................ (21)

Required in other departments:
Level IV proficiency in a foreign language.

Option B
36 major hours, including:

Hist 101Western Civilization I ............................................. (3)
Hist 102Western Civilization II............................................. (3)
Hist 103United States to 1877 ............................................ (3)
Hist 104United States since 1877 .................................... (3)
Hist 240The Historian's Craft ........................................ (3)
Hist 440Research ...................................................... (3)
Electives (15 must be upper level) ................................ (18)

Of the 18 elective hours 12 must form a concentration in either World or American History.

Required in other departments:
Anth 171Introduction to Cultural Anthropology ............... (3)
Econ 105Elements of Economics ........................................ (3)
Econ 420Economic Education ............................................. (3)
Geog 161World Regional Geography ................................. (3)
Geog 319Geography for Teachers ....................................... (2)
Pols 115American Government I ....................................... (3)
Pols Elective ............................................................. (3)
Soc 110Introduction to Sociology ......................................... (3)

MINOR IN HISTORY

Required 20 credits, at least 6 must be in upper division courses, including:
9 hours from:

Hist 101Western Civilization I ............................................. (3)
Hist 102Western Civilization II............................................. (3)
Hist 103United States to 1877 ............................................ (3)
Hist 104United States since 1877 .................................... (3)

History electives ................................................................ (11)

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:

Hist 330The United States: Social and Cultural 19th Century .... (3)
Phi 300Classical Greek and Hellenistic Philosophy .............. (3)
Phi 301Medieval Period ..................................................... (3)
Phi 302Renaissance to Enlightenment ................................. (3)
Phi 303Kant and the Nineteenth Century Philosophy ........... (3)
Phi 304Twentieth Century Philosophy ................................ (3)
Phi 309American Philosophy ............................................ (3)
Art 210, 211Art History I & II ............................................... (6)
Art 410History of Art: Selected Subjects ............................. (3)

Courses

101. Western Civilization I 3 credits. An interpretive survey of Western Civilization from earliest times to the close of the European Middle Ages. F, S

102. Western Civilization II 3 credits. A comprehensive survey of Western Civilization from the Reformation to the present, with emphasis on movements and institutions common to Western Europe and their influence on the rest of the world. F, S

103. United States to 1877 3 credits. A survey of early American history, including old world background, transformation of British institutions into American institutions, revolution, and the establishment of the Union with its temporary breakup in Civil War. F, S

104. United States since 1877 3 credits. A survey of the history of the United States since Reconstruction, including the transformation of an isolationist, agrarian nation into an urban industrial and world power with attention to the resulting domestic social, economic and political changes. F, S

106. Middle Eastern Civilization From Islam to Present Time 3 credits. A survey history of the civilizations of the Eastern Mediterranean since the rise of Islam to the time of the formation of the present nation states. S, W

204. Canada to 1867 3 credits. A survey of pre-Confederation Canadian history from the pre-Columbian period to 1867. Particular attention will be paid to the social, economic, and political factors in Europe and North America which shaped Canada's colonial history since the Civil War. F, S

205. Canada Since 1867 3 credits. A survey of Canadian history from Confederation to the present. Beginning with an overview of pre-Confederation Canada, this course will focus upon the cultural, economic, and political factors that have shaped Canada through the modern era. S

210. United States Military History 3 credits. A survey from colonial times to the present of the Army's role in the formulation and implementation of national defense. Attention is given to the Constitutional and legal status of the Army, changing concepts in military organization and training, public attitudes toward the military, and the influences of the Army on American society. Specific wars and battles are studied in terms of military tactics and strategy. F

220. History of North Dakota 3 credits. A survey emphasizing settlement and development, noting the consequences of the state's location, climate, and settlers on the situation in which it now finds itself. Special attention is paid to the Nonpartisan League story and the evolution of isolationist sentiment among North Dakotans. Recommended for Social Science major certification. F, S

221. The Scandinavian Countries Since 1500 3 credits. A survey of Denmark, Norway, Sweden, Finland, and Iceland from the Lutheran Reformation to the welfare state. S, W

240. The Historian's Craft 3 credits. An introduction to research and writing history. Students will learn critical reading of secondary sources, how to locate and evaluate resources, how to analyze evidence, how to apply the style and form of historiographical writing, and how to utilize methods of research. Students will also study historiography and types of historical writing and practice. F

269. World War II 3 credits. A brief survey of the background, strategy and major campaigns of World War II including some of the diplomatic and political problems encountered by the major belligerents. The course includes extensive use of documentary film. S, W

300. Topics in History 1 credit. Repeatable to 6. 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. F, S

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

325. The American West to 1890 3 credits. An examination of major issues in the American West beginning with the trans-Appalachian West and proceeding to the trans-Mississippi West. The course will examine social, political, military, and economic developments in the context of the Western environment. F, W

326. The American West since 1890 3 credits. An examination of the major issues in the trans-Mississippi West during the twentieth century. This course will examine social, political and economic developments in the context of the western environment. S, W

330. The United States: Social and Cultural, 19th Century 3 credits. A survey of the contributions of social institutions (such as the family, school, and church) to the development of a national culture. The colonial background is considered briefly, but emphasis is given to the first half of the nineteenth century. Changing attitudes toward social reform, intellectualism, class status, and minorities (such as children, women, blacks, and Indians) are examined. Competing regional trends in economics, social, political, and intellectual attitudes and institutions provide the dynamics for understanding the failure of nationalism during the antebellum period. F, W

332. Women in American History to 1865 3 credits. A survey of U.S. women's history from the fifteenth century to 1865. The course will examine historical events and their significance for women of diverse cultures and classes. F, S

333. Women in American History Since 1865 3 credits. A study of the history of American women after the adoption of the Thirteenth Amendment to the Constitution. The course will examine historical events and their significance for women of diverse cultures and classes. S, W

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, W

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 Indo-China 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, W
340. Women in Early Modern Europe. 3 credits. This course surveys women’s experiences in the development of European civilization from the Renaissance to the mid-18th century. The class will examine such issues as perceptions of gender, the role of institutions in defining women’s “place,” women’s contributions to their societies, economies, states and cultures, the realities of their daily lives and their responses to these realities, and the significance for women of such developments as the Renaissance, the Reformation, social revolution, Imperialism, warfare and scientific discoveries. F/2

341. Women in European History Since 1750. 3 credits. This course surveys women’s experiences in the development of European civilization from the mid-18th century to the present. The class will examine such issues as perceptions of gender, the role of institutions in defining women’s “place,” women’s contributions to their societies, economies, states and cultures, the realities of their daily lives and their responses to these realities, and the significance for women of such developments as the industrial revolution and modern political revolutions, the First and Second World Wars, the Holocaust and the Cold War. F/2

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/2

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/2

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 major areas emphasized. S/2

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. F/2

350. Europe: The Reformations, 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/2

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/2

352. Europe: French Revolution and Napoleonic Era, 1789-1815. 3 credits. An engaging course that serves as an admirable vehicle with which to observe human nature at its best and worst, as people responded to unprecedented and unexpected problems and opportunities. Neither Europe nor the world were the same after this classic revolution and studying it compels a conclusion on how revolutions begin and, once begun, whether they move under their own momentum from moderation to excess to reaction. S/2

355. Europe: 1815-1918. 3 credits. A study of such movements as industrialism, socialism, nationalism, and imperialism, developing the theme that those who sought to change behavior, institutions, frontiers, or governments from 1815 to 1848 employed idealistic and impractical means. After the 1848 revolutions that swept over Europe, a new “toughness of mind” emerged and those seeking to effect change became more practical and pragmatic, as manifested, for example, in Marxism and Realpolitik. F/2

355. Europe Since 1918. 3 credits. A survey of European history from 1914 to the present. Emphasis will be placed on the issues, institutions, and problems confronting Europeans after the Great War of 1914-1918, a war that was fought “to make the world safe for democracy,” but which was an event that signified “the end of the European Age,” a period during which Europeans and their institutions had exerted a dominant influence around the world. S/2

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 revolutions. F

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 racial 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

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

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

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

403. The United States: The Colonial Period. 3 credits. A survey of a background of British colonization, the development of diverse colonial cultures, and the transfer of institutions in maturing political societies of the European heritage. The seventeenth-century Age of Faith and the eighteenth-century Age of Reason are contrasted to illustrate the changing attitudes of Americans toward themselves and Britain. The enduring theme is long-range causes of American independence. S/2

404. The United States: The Provisional Era, 1760-1789. 3 credits. A survey of the immediate causes of the American Revolution, with emphasis upon the incompatibility of American and British constitutional and ideological views. American techniques of propaganda and resistance are analyzed; military history is deemphasized. The results of independence are discussed in terms of the changing attitudes reflected in the Declaration of Independence, the Articles of Confederation, and the Constitution. S

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/2

406. The United States: Civil War and Reconstruction, 1850-1877. 3 credits. A study of the celebration of the frontier, sectionalism and racism which caused the temporary breakdown of the American democratic process and the tragedy of Civil War and Reconstruction. S/2

407. The United States: Rise of Industrial America, 1877-1917. 3 credits. A survey of the rise of America to 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/2

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/2

412. U.S., Foreign Relations Since 1900. 3 credits. An advanced survey of the major policies advanced and pursued by the U.S. during the 20th century. S/2

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/2

416. Russia to 1855. 3 credits. A survey of Russia’s political, economic, and cultural development before the beginning of modern reforms and the growth of revolutionary ideas. F

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/2

421. The British Empire, 1496-1884. 3 credits. A survey of a British Imperial history from the Tudors to the “Scramble for Africa.” Particular attention is paid to the social, economic, and political factors which shaped Britain’s Imperial history as well as the history of its colonies. F/2

422. The British Empire and Commonwealth, 1884-the present. 3 credits. A survey of British Imperial history in the “Scramble for Africa.” 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/2

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. F/2

425. American Family in Historical Perspective. 3 credits. This course is designed to provide students with a broad understanding of globalization. S/2

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, government, social organization, economics, and politics from the ancient past to the present. S/2

440. Research. 3 credits. In this course, students will design and conduct a major research project. Students will work with a member of the faculty who will guide their research and present their research orally. F, S

450. European Social History. 3 credits. This course will cover the methods, historiography, and problems of European social history. The course is divided into three sections for topical content: the Ancien Régime, the Age of Reform, and the Twentieth Century. There are several fairly specific African skills for this research orally. F, S
larger discussion of facts, individuals, events, etc.; and to be able to construct a sound historical thesis/argument of their own, whether in writing or class discussions. F/2

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/2

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/2

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. F

481. Public History Practice. 3 credits. A practicum in which the student learns through experience the techniques of public history work. S/2

489. Senior Honors Thesis. 1-15 credits; total not to exceed fifteen. Prerequisite: consent of the Department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F, S

494. Readings in History. 1-3 credits. Repeatable to 6. F, S

Histotechnician Certificate Program

Droog, Hoffman, Paur (Program Director), Schill and Sens (Chair)
http://medicine.nodak.edu/histotech

The Histotechnician Certificate Program at the University of North Dakota is within the Department of Pathology. It is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), which is located at 8410 W. Bryn Mawr Ave., Suite 670, Chicago, IL 60631-3415, 773-714-8880.

Histotechnology professionals are qualified to provide service and research in histotechnology and related areas in rapidly changing and dynamic healthcare delivery system. Histotechnicians have diverse and multi-level functions in the areas of analysis and clinical decision-making, information management, regulatory compliance, education, and quality assurance/performance improvement wherever anatomic pathology testing is researched, marketed, developed or performed.

Histotechnology professionals perform, develop, evaluate, correlate and assure accuracy and validity of laboratory testing and procedures; direct and supervise anatomic pathology laboratory resources and operations; and collaborate in the diagnosis and treatment of patients. They possess skills for financial management, operations, marketing, and human resource management of the histopathology laboratory.

Histotechnology professionals practice independently and collaboratively, being responsible for their own actions, as defined by the profession. They have the requisite knowledge and skills to educate laboratory professionals, health care professionals, as well as the public in laboratory practice.

The ability to relate to people, a capacity for calm and reasoned judgment, and a demonstration of commitment to the patient are essential qualities. Communication skills extend to consultative interactions with members of the health care team, external relations, customer service and patient education.

Histotechnology professionals demonstrate ethical and moral attitudes and principles that are necessary for gaining and maintaining the confidence of patients, professional associates, and the community (“Guide to Accreditation for Histotechnician Programs” National Accrediting Agency for Clinical Laboratory Sciences.)

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.

Admission Requirements/Admission to the Histotechnician Certificate Program required prerequisites: verification of at least a 2.8 GPA and successful completion of the following courses with a C or better (all are existing courses within the North Dakota University System):

- Social Science, Humanities or Composition, 3 credits
- Introduction to Chemistry (Chem 115/L), 4 credits
- Concepts of Biology (Biol 111/L), 4 credits

The requirements for entrance into the Histotechnician Certificate Program include verification of acceptance by a clinical site that meets the specification for acceptance in the Histotechnician Certificate Program.

At least 60 credits of post-secondary coursework are recommended before applying for admission to the Histotechnician Certificate Program.

Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PA TH 360</td>
<td>Histology Laboratory Theory</td>
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<tr>
<td>PA TH 361</td>
<td>Histology Laboratory Technique**</td>
<td>3</td>
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<tr>
<td>PA TH 362</td>
<td>Histotechniques I*</td>
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<td>PA TH 363</td>
<td>Histotechniques II*</td>
<td>3</td>
</tr>
<tr>
<td>PA TH 365</td>
<td>Histology Clinical Practicum I**</td>
<td>3</td>
</tr>
<tr>
<td>PA TH 366</td>
<td>Histology Clinical Practicum II**</td>
<td>3</td>
</tr>
</tbody>
</table>

* Online course

**Clinical Internship at accredited medical center

Exceptions for acceptance of students may be made by petition to the Department of Pathology Professional and Academic Standards Committee at the University of North Dakota School of Medicine and Health Sciences.

All students registered in the Histotechnician Certificate courses have a specific Histotechnician tuition assessed; additional information may be obtained from the Clinical Laboratory Science office (701-777-2634). Upon successful completion of the program the student will receive a Histotechnician Certificate from UND and will have met the eligibility requirements for the national certification examination.

Courses

360. Histology Laboratory Theory. 3 credits. This course presents an overview of standard histopathology laboratory practices including laboratory calculations, safety, quality assurance, information management, laboratory education, instrumentation, and proper specimen collection and handling.

361. Histology Laboratory Technique. 1 credit. Techniques and practice in use of general laboratory equipment, reagents and procedures utilized in histology.

362. Histotechniques I. 3 credits. This course is the introduction to the fundamental techniques, including fixation, processing, instrumentation, and solution preparation. Cytoplasmic, nuclear, carbohydrate, and amyloid staining will be presented.

363. Histotechniques II. 3 credits. This course is the continuation of the fundamental techniques of histology including muscle and connective tissue, nerves, microorganisms, pigment, minerals, cytoplasmic granules, immunohistochemistry, and enzyme histochemistry.

367. Histology Clinical Practicum I. 3 credits. Communication skills, attitude and work performance will be evaluated. The skills involved will emphasize the fundamental techniques including fixation, specimen processing, instrumentation, sectioning and staining with emphasis on the Hematoxylin and Eosin stain.

368. Histology Clinical Practicum II. 3 credits. Individual assignments in an accredited histology lab. Emphasis on refining skills learned in Histology Practicum I, staining procedures and tissue identification.
Honors (Hon)  
S. Pyle, Program Director

For a full description of the Honors Program, see the University Information 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 Portfolios, submitted upon completion of nine Honors credits.

III. Senior Honors thesis.

Note: Honors Program requirements may substitute for the University General Education Requirements.

Courses

101. Inquiry in the Humanities. 1-4 credits. Prerequisite: admittance to the Honors Program. Reading and discussion of selected works that reflect the methodology and concerns of the humanities; orientation to methods of Honors work. Normally taken by first-year students in the Honors Program. F,S,SS

101S, Honors Seminar. 0 credits. Prerequisite: Acceptance into the Honors Program. Corequisite: Honors 101. This course is intended primarily as a student-led discussion class aimed at helping first-semester students make the transition from high school to college. This course also provides students with information on the Honors Program. The course is modeled after Introduction to University Life with a few modifications: more emphasis on writing and the peer review process; incorporation of readings and discussion topics that parallel the Honors Program first-semester course. Constructing the Self (Honors 101); and exposure to a range of cultural and educational experiences on campus and in the community. The course meets once a week for an hour. F

102. Inquiry in the Social Sciences. 1-4 credits. Prerequisite: admittance to the Honors Program. Readings and discussion of selected works that reflect the methodology and concerns of the social sciences; orientation to methods of Honors work. Normally taken by first-year candidate-members of the Honors Program. F,S,SS

103. Inquiry in the Sciences. 1-4 credits. Prerequisite: admittance to the Honors Program. Readings and discussion of selected works that reflect the methodology and concerns of the sciences; orientation to methods of Honors work. May include laboratory component. Normally taken by first-year candidate-members of the Honors Program. F,S,SS

250. Sophomore Portfolio Workshop. 1 credit. Prerequisite: admittance to the Honors Program. An in-depth portfolio used to evaluate writing at the sophomore level. F,S,SS

291. Colloquium in the Humanities. 1-4 credits, repeatable. Prerequisite: admittance to the Honors Program. Interdisciplinary courses on varying topics related to the humanities; student participation in the form of writing, research, and discussion is stressed. F,S,SS

292. Colloquium in the Social Sciences. 1-4 credits, repeatable. Prerequisite: admittance to the Honors Program. Interdisciplinary courses on varying topics related to the social sciences; student participation in the form of writing, research, and discussion is stressed. F,S

293. Colloquium in the Sciences. 1-4 credits, repeatable. Prerequisite: admittance to the Honors Program. Interdisciplinary courses on varying topics related to the sciences; student participation in the form of writing, research, and discussion is stressed. F,S

301. Honors Mode. 1 credit. Corequisite: Standard course which Honors Mode complements. 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. F,S,SS

391. Advanced Colloquium in the Humanities. 1-4 credits, repeatable. Prerequisite: admission to the Honors Program. Advanced interdisciplinary courses on varying topics in the humanities. F,S,SS

392. Advanced Colloquium in the Social Sciences. 1-4 credits, repeatable. Prerequisite: admittance to the Honors Program. Advanced interdisciplinary courses on varying topics in the social sciences. F,S

393. Advanced Colloquium in the Sciences. 1-4 credits, repeatable. Prerequisite: admittance to the Honors Program. Advanced interdisciplinary courses on varying topics in the sciences. F,S

395. Research Methods. 1 credit. S/U grading. Prerequisite: Junior standing, full membership in Honors Program. An introduction to the senior thesis process. Students will design a senior thesis project and write a prospectus for submission to the Honors Committee. F,S

399. Independent Study. 1-4 credits (repeatable to 12 credits). Prerequisite: admittance to the Honors Program. Individual instruction on specified topics arranged by mutual agreement among teacher, student, and the Program. F,S,SS

489. Senior Honors Thesis. 1-8 credits repeatable to 9. Prerequisite: consent of the Department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F,S,SS

Humanities (Hum)  
Barrentine, Carmichael (Coordinator), LaPierre, Magness and Rand

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 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 general education program for first year students. See the Integrated Studies Program listing for more information.

Courses

101. Introduction to Humanities I. 1-4 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 each semester will vary, often focusing on a central theme. Class time will be used to discuss the texts and students will be expected to attend events of the fine arts. F

102. Introduction to Humanities II. 4 credits. While this course has the same structure and goals as Humanities 101, its subject matter often focuses on the writing of classical Greece. The authors read usually include Homer, AESCHYLUS, SOPHOCLES, and Plato. S

212. Integrated Cultural Experience. 3 credits. Prerequisite: consent of instructor for TRIO students only. 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. F,S

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
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. F, S

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. Enrollment limited to Integrated Studies students. F, S

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


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. F, S. SS/University of North Dakota

Indian Studies (IS)
Braun, Gagnon and Hans (Chair)

The 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 Indian history and culture, (2) practical experiences in Indian communities, (3) a basis for employment in either reservation or non-reservation settings, and (4) background for graduate work in Indian Studies. The degree of Bachelor of Arts is offered through the College of Arts and Sciences. For the greater University community, the courses in Indian Studies, together with the research conducted or sponsored by the Department, provide an expanded approach to the study of American history. Another purpose of the program is to enable the University to serve the reservation communities, especially in their educational and human service programs. As the Indian Studies program develops, more basic information, teaching materials, technical data, and staff assistance will be available to Indian schools, programs, and Indian leaders.

College of Arts and Sciences
B.A. WITH MAJOR IN 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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

A. Required courses - 12 hours:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 121</td>
<td>Introduction to Indian Studies</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 240</td>
<td>Research and Writing in Indian Studies</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 410</td>
<td>Identity in Native North America</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 420</td>
<td>Federal Indian Law and Policy</td>
<td>(3)</td>
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</table>

6 hours from Literature, Languages and Cultures:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 220</td>
<td>Indians in Children’s Literature</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 250</td>
<td>Lakota Language I</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 251</td>
<td>Lakota Language II</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 255</td>
<td>Survey of Native American Arts</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 350</td>
<td>American Indian Languages</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 352</td>
<td>American Indian Philosophical Thought</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 360</td>
<td>Oral Traditions in American Indian Cultures</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 265</td>
<td>Native American Literature</td>
<td>(3)</td>
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</table>

6 hours from History and Government:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>IS 201</td>
<td>History of the Sioux</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 203</td>
<td>History of the Chippewa</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 207</td>
<td>History of the Three Affiliated Tribes</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 331</td>
<td>Traditional Plains Indian Cultures</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 370</td>
<td>North American Indians</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 415</td>
<td>History of American Indian Education</td>
<td>(3)</td>
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</table>

6 hours from Contemporary Issues:

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<tr>
<td>IS 330</td>
<td>Contemporary Plains Indian Cultures</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 346</td>
<td>American Indian Women</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 371</td>
<td>Reservation Government and Politics</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 380</td>
<td>Indians in the 21st Century</td>
<td>(3)</td>
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<tr>
<td>IS 385</td>
<td>American Indian Economic Development</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 388</td>
<td>American Indians and Ecology</td>
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Special Permission:

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<th>Credits</th>
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<tr>
<td>IS 494</td>
<td>Independent Student</td>
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<tr>
<td>IS 492</td>
<td>Directed Readings</td>
<td>(1-3)</td>
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<tr>
<td>IS 430</td>
<td>Internship</td>
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Summer:

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<tr>
<td>IS 121</td>
<td>Introduction to Indian Studies</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 151</td>
<td>White Images of Native Americans</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 171</td>
<td>Hollywood Indians</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 425</td>
<td>Tribal Colleges</td>
<td>(3)</td>
</tr>
</tbody>
</table>

B. A concentration in another area or field:

1. Proficiency in a language (equivalent to Level IV in a Native American or other language)
2. A minor in another subject matter field
3. In special instances, a supplementary concentration of at least 24 hours can be arranged between the student and the faculty of the Department. These concentrations are designed for students to obtain coursework in areas which complement the major.
4. Certification for teaching in the public schools. (It should be noted that at present Indian Studies is not a certifiable major. Thus, one must complete the requirements for a composite Social Science or another certifiable teaching major, as well as take the professional education foundations courses required of teacher candidates. Courses in Indian Studies may serve as an area of concentration in the Social Science major.)

MINOR IN INDIAN STUDIES

Required 22 credits including:

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<tr>
<th>Course Code</th>
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<td>Introduction to Indian Studies</td>
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<td>IS 240</td>
<td>Research and Writing in Indian Studies</td>
<td>(3)</td>
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<tr>
<td>IS 410</td>
<td>Identity in Native North America</td>
<td>(3)</td>
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<tr>
<td>IS 420</td>
<td>History of Federal Indian Law and Policy</td>
<td>(3)</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>(10)</td>
</tr>
</tbody>
</table>

Courses

121. Introduction to Indian Studies. 3 credits. Introduction to content, concepts and methods of Indian Studies courses, with emphasis on a survey of subject matter designed to provide a foundation for further study. F, S

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 ethnocentrisms 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 ethnocentrisms in print and film. SS

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

201. History of the Sioux. 3 credits. This class introduces the societies and cultures of Siouan speakers over time, focusing mostly on Lakota/Dakota groups, with an emphasis from the 17th century to the early 20th century. F

203. History of the Chippewa. 3 credits. A study of the development of Chippewa (Anishinabe, Ojibwe) society from its origins to the present. Topics include origin traditions, development of cultural distinctiveness, relations with other tribes and with French, English, and Americans, treaties, and current political, cultural, and economic status. S

207. History of the Three Affiliated Tribes. 3 credits. A survey of the history of the Mandan, Hidatsa, and Arikara people. The first part of the course deals with the history of the separate tribes, and the second part is concerned with their corporate history since 1862. S

212. Trade in Native North America. 3 credits. How did and do cultures interact with their environment? This class provides answers from cultural ecology and a focus on historical and contemporary North American Indian societies. On demand.
220. Indians in Children’s Literature. 3 credits. Students will be introduced to the joys of children’s literature with a focus on American Indians. Learning will include reading and reviewing Indian subject books appropriate for pre-school, elementary, and secondary children; applying criteria for the selection of appropriate books; and practicing evaluative writing. Outstanding authors, illustrators, and books will be featured and discussed. Students will learn to analyze issues involved in literature including stereotyping, insensitivity, and accuracy. S

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 their choosing. S

250. Lakota Language 1. 3 credits. This is the first of two Lakota language classes for beginning speakers. On demand.

251. Lakota Language II. 3 credits. Prerequisite: IS 250 or permission. This is the second of two Lakota language classes for beginning speakers. On demand.

255. Survey of Native American Art. 3 credits. Examination of the methods, materials, and techniques of Native American visual arts, music, dance, and drama.

310. North American Indian Cultures. 3 credits. The course investigates cultural perceptions of health as well as specific historic and contemporary health problems in indigenous communities in Canada and the United States. On demand.

330. Contemporary Plains Indian Cultures. 3 credits. The second of two classes providing an overview of the history and cultures of the indigenous societies of the Great Plains, this course focuses on the 20th century. S

331. Traditional Plains Indian Cultures. 3 credits. The second of two classes providing an overview of the history and cultures of the indigenous societies of the Great Plains, this course focuses on the 20th century. S

346. American Indian Women. 3 credits. An examination of the historical and contemporary traditions, roles, contributions, and issues concerning Indian women. S

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

351. Native American Philosophical Thought. 3 credits. Introduces students to the complex and rich “religions” of Native American tribes as well as to the Church of Native Americans and the Native American Religious Freedom Act. Both traditional and contemporary belief systems and their importance are discussed. F

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

370. North American Indians. 3 credits. Examines the development and evolution of American Indian societies in North America. Students will learn about the cultures of American Indian tribes, tribal interactions, and key aspects of American Indian history. The course begins with origin traditions and archaeological knowledge concerning origins and moves to an examination of the Paleo-Indian, Archaic, and Woodland Eras and then moves to the development of tribes. Tribal relationships with European colonists and the United States will be examined through the development of reservations and the emergence of reservation sovereignty. F

371. Reservation Government and Politics. 3 credits. Places the more than 300 tribal governments in the context of Indian and United States history. Examines the development of contemporary tribal governments with emphasis on their place as the third form of government in the United States. The concepts of sovereignty, tribal jurisdiction, and tribal governance are analyzed. S

372. American Indian Economic Development. 3 credits. The course explores American Indian economic development issues, initiatives, and concepts. It is expected that students will be of service to the tribes in their field of interest within Indian Studies. Internship placements are with Native American related public or private sector sponsors such as tribal programs, businesses, and federal programs. On demand.

373. American Indian Social Welfare. 3 credits. The course explores the social welfare system in American Indian society. Students will become familiar with various social work and welfare programs and services including tribes, the Bureau of Indian Affairs, states, and local communities. S

374. American Indian Political Science. 3 credits. An examination of the history, politics, and contemporary issues of American Indian political organizations. S

375. Sociology of American Indian Families. 3 credits. Introduces students to the sociological study of American Indian families. S

376. American Indian History. 3 credits. Examines the history, culture, and political developments of American Indian societies in North America. S

377. Internship in American Indian Studies. 1-3 credits (Repeatable when topics vary). Topics and credit may vary with availability of staff, and with student interests. S

379. Special Topics. 1-3 credits (Repeatable when topics vary). Topics and credits will vary with availability of staff, and with student interests.

380. Indians in the Twenty-First Century. 3 credits. More than 563 federally recognized tribes and 2.4 million American Indians entered the 21st century. Indians have a unique status within the United States resulting from history. This course examines the unique Status and its origins, explores the issues, both positive and negative, that face American Indians and their governments, and explores the place of Indians within the United States. Topics include: the legacies of Indian cultures and federal policies, tribal governments and their interactions with state and federal governments, health and wellness issues, social developments, and urban Indians. F

385. American Indian Economic Development. 3 credits. The course explores American Indian economic development issues, initiatives, and concepts as necessary linked to globalization and global social, economic, cultural, and political issues. S

406. American Indian and Ecological Studies. 3 credits. How did and do cultures interact with their environment? This class provides answers from cultural ecology with a focus on historical and contemporary North American Indian societies. F

410. Identity in Native North America. 3 credits. The course investigates concepts, definitions, and inventions of identity in Native North America, from federal definitions of personhood and society. S

415. History of American Indian Education. 3 credits. Throughout the centuries of American Indian and white contact, American Indian education advocated by the colonizers and federal governments as well as 378. History of American Indian Education. 3 credits. Throughout the centuries of American Indian and white contact, American Indian education advocated by the colonizers and federal governments as well as by various denominations has helped shape changing attitudes, stereotypes, and ethnicnorms of Europeans and Euro-Americans 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. F

420. History of Federal Indian Law and Policy. 3 credits. Knowing the foundations of American Indian law and policy is necessary for understanding contemporary Indian relationships within the United States. This course analyzes the policies of the United States toward American Indians and their governments since 1781. Students will learn the key components of imperialism, colonialism, Self-government, Termination and Self-Determination policies. Students will learn the meaning of the Marshall decisions, treaties and key federal court decisions that shape American Indian law and the cultural-political philosophies that guided them. Emphasis will be on the impact of federal Indian law on Indian and their governments. S

425. Tribal Colleges and Higher Education. 3 credits. This course examines the phenomenon of the development and operations of tribal colleges since the 1960s and their place in higher education. Emphasis will be on the missions of tribal colleges, their effects on tribal societies, and aspects of tribal college strengths and concerns. Students will conduct research on various facets of tribal colleges and tribal college students. S

430. Internship in Indian Studies. 3 credits. Prerequisite: instructor permission. Internship provides 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, and federal programs. On demand. S

492. Directed Readings in Indian Studies. Prerequisites: Upperclass standing or consent of instructor. Under the direction of Indian Studies faculty, students will select readings in subjects not covered in sufficient detail in other Indian Studies classes. F,S,SS

494. Independent Study in Indian Studies. 1-3 credits. Maximum 9 credits. Consent of Instructor required. F,S,SS

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**Information Systems (ISys)**

**Breathen, Lawson-Body, O’Keefe (Chair) and Zuo**

The Bachelor of Business Administration with a major in Information Systems is offered through the Department of Information Systems and Business Education. This major offers broad preparation for a variety of information systems careers in corporate, government, and small business environments. UND Information Systems graduates go into careers as network administrators, database developers, information systems analysts, software programmers, technology consultants, computer support specialists, administrative services managers, computer systems vendors, and into a wide variety of emerging positions within the information systems and technology field. Job titles range from entry-level information management systems positions, e.g., technical support, to those in senior management, e.g., Chief Information Officer (CIO).

**College of Business and Public Administration**

**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. General Education Requirements (see University GER listing).

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acc 200, 201</td>
<td>Elements of Accounting I &amp; II</td>
</tr>
<tr>
<td>Acc 315</td>
<td>Business in the Legal Environment</td>
</tr>
<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
</tr>
<tr>
<td>Econ 202</td>
<td>Principles of Macroeconomics</td>
</tr>
<tr>
<td>Econ 310</td>
<td>Introduction to Business and Economic Statistics</td>
</tr>
<tr>
<td>Econ 303</td>
<td>Money and Banking</td>
</tr>
<tr>
<td>Fin 310</td>
<td>Principles of Financial Management</td>
</tr>
<tr>
<td>Isys 117</td>
<td>Personal Productivity with Information Technology</td>
</tr>
<tr>
<td>Cpt 437</td>
<td>Systems in Enterprise</td>
</tr>
<tr>
<td>Math 103</td>
<td>College Algebra</td>
</tr>
<tr>
<td>Math 146</td>
<td>Applied Calculus I</td>
</tr>
<tr>
<td>Mgmt 300</td>
<td>Principles of Management</td>
</tr>
<tr>
<td>Mgmt 301</td>
<td>Operations Management</td>
</tr>
<tr>
<td>Mgmt 475</td>
<td>Strategic Management</td>
</tr>
<tr>
<td>Mrkt 305</td>
<td>Marketing Foundations</td>
</tr>
<tr>
<td>Poli 115</td>
<td>American Government I</td>
</tr>
<tr>
<td>Psy 111</td>
<td>Introduction to Psychology</td>
</tr>
</tbody>
</table>
III. Information Systems Major Courses:

- ISBE 320 Professional Communication for Business (3)
- ISys 260 Operating Systems Principles (3)
- ISys 305 End-User Applications (3)
- ISys 315 Records and Information Management (3)
- ISys 330 Relational Database Design (3)
- ISys 360 Principles of Networking (3)
- ISys 411 Information Systems Seminar (3)
- ISys 420 Systems Analysis and Design (3)
- CSci 120 Comp Prog I: Visual Basic I (4)
- CSci 170 Comp Prog II: Visual Basic II (4)
- Two of the following, one of which must be CSci 160 Java, COBOL, or C++
- CSci 160 Comp Sci I: Java (4)
- CSci 160 Comp Sci I: COBOL (4)
- CSci 160 Comp Sci I: C++ (4)
- CSci 242 Algorithms and Data Structures (3)
- CSci 250 Assembly Language Programming (4)
- CSci 445 Math Modeling and Simulation (3)

Electives (minimum 3 courses, 9 credits):
- ISys 308 Information Resource Administration (3)
- ISys 370 IntrAnet Development (3)
- ISys 430 Relational Database Development (3)
- ISys 460 Advanced Networking (3)
- ISys 499 Special Topics (ISys topic) (3)
- ISBE 397 Cooperative Education (1-6)
- ISBE 497 Internship in Information Systems and Business Education (1-6)

MINOR IN INFORMATION SYSTEMS

22-23 semester hours, including:
- ISys 117 Personal Productivity with Information Technology (1)
- ISys 260 Operating Systems Principles** (3)
- ISys 305 End-User Applications* (3)
- ISys 317 Information Systems in Enterprise (3)
- ISys 330 Relational Database Design* (3)
- CSci 120 Computer Programming I (Visual Basic) (4)
- CSci 160 Computer Science I (Java) (4)

Electives: (minimum 3 courses, 9 credits)
- ISys 300 and/or 400 level courses: Not to include ISys 397, 411, 420, or 497
- * Prerequisite: ISys 117 required for all CoBPA majors
- ** Prerequisite: ISys 305 and Csci 120

College of Education and Human Development

MINOR IN OFFICE ADMINISTRATION

(Not available for Information Systems majors)

23 hours, including:
- ISys 117 Personal Productivity with Information Technology (1)
- ISys 305 End-User Applications (3)
- ISys 315 Records and Information Management (3)
- ISys 317 Information Systems in Enterprise (3)
- ISBE 320 Professional Communication for Business (3)
- Mgmt 300 Principles of Management (3)

Elect eight hours from courses in ISBE/ISys and/or from the College of Business and Public Administration.

Courses

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
260. Operating Systems Principles. 3 credits. Prerequisite: ISys 117. 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, DOS, UNIX, OS/400, and Windows NT Workstation and Server. F,S
305. End-User Applications. 3 credits. Prerequisite: ISys 117. 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. S,F
308. Information Resource Administration. 3 credits. Introduction to information management and office management concepts and technologies including office automation, office facilities development, technology selection and implementation, office systems and procedures analysis, and office personnel supervision. F
315. Records and Information Management. 3 credits. Stresses the systematic design and control over the creation, distribution, utilization, retention, storage, protection, preservation, and final disposition of records. Examination of the management of recorded information on a variety of media, including paper, microfilm, magnetic, optical, and electronic records. Costs and systems analysis, electronic filing, computer-assisted retrieval, micrographics, forms management, and imaging systems are also discussed. F,S
317. Information Systems in Enterprise. 3 credits. Prerequisite: ISys 117. 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. F,S,SS
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 emphasized. F,S
330. Relational Database Design. 3 credits. Prerequisites: ISys 305, CSci 120, Comp Prog I: Visual Basic I. Stresses design and utilization of databases, emphasis on both minicomputer and microcomputer database development environments, integrity and security issues. Project oriented. S
360. Principles of Networking. 3 credits. Prerequisite: ISys 260. 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 physical and signal design of local area networks. F
370. Internet/Intranet Development. 3 credits. Prerequisite: Sophomore, Junior, Senior or higher standing. A survey of information systems development using Internet/Intranet technologies. This is a course that requires a great deal of outside work. F
397. Cooperative Education. 1-6 credits, repeatable to 12 credits. Prerequisites: overall GPA 2.5; approval of the Director of ISBE Cooperative Education. On-the-job compensated work experience in various areas related to Information Systems, Marketing, Education, and Business Education. S-U grading only. F,S,SS
411. Information Systems Seminar. 3 credits. Prerequisites: ISys 315, 360, 420; ISBE 320. The capstone course for the Information Systems majors. Students will use the knowledge gained from previous Information Systems courses to participate in seminars, case studies, simulations, and field experience projects involving present and emerging information systems topics. F
420. Systems Analysis and Design. 3 credits. Prerequisite: ISys 330. A survey of current practices in the development of information systems. Topics may include structured systems analysis and design, joint application development, prototyping, rapid application development, end-user development, and change theory and control. Project oriented. F
430. Relational Database Development. 3 credits. Prerequisites: ISys 330, 420 and CSci 120 or 160. Corequisite: ISys 420. Focus on development of information systems that rely on relational databases for data storage and retrieval. Topics may include advanced SQL, embedded SQL, Oracle, SQL Server, Cold Fusion, Advanced Visual BASIC, and COBOL. Project oriented. F
460. Advanced Networking. 3 credits. Prerequisite: ISys 360. An in-depth study of networking protocols, planning, design, security, workstation and server management, NAS, performance tuning, troubleshooting, and when possible, enterprise level network topics. S
499. Special Topics. 1-3 credits, repeatable to 12 credits. Topics will be selected on the basis of currency and relevancy to student needs. On demand.

Integrated Studies

Barrente, Carmichael (Coordinator), LaPierre and Magnes

(The permanent faculty is supplemented by faculty from other University departments.)

A nationally-known, award-winning program, the Integrated Studies Program is housed in the Humanities Program at the University and provides an alternative method for taking the general education classes which UND requires. Students who take classes through Integrated Studies (ISP) will take three to five courses each semester through the Program: all courses help students fulfill general education requirements necessary for all University undergraduate degrees. (See University GER listing for information.) Each semester students receive credit from the following general education categories: Arts and Humanities; Communications; Social Sciences; and Math, Science, and Technology. Additional credits each term may also be offered in the Arts and Humanities category. Information on most course offerings can be found under the Humanities Department listing.
Below is an example of the general education requirements for undergraduates and the credits offered during one semester of ISP. Both a fall and a spring semester experience in the Program are offered; the total number of credits and their category distribution are similar each semester.

<table>
<thead>
<tr>
<th>Department</th>
<th>Required Credits at UND</th>
<th>Credits offered in ISP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Arts and Humanities</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Math, Science, Technology</td>
<td>12</td>
<td>3</td>
</tr>
</tbody>
</table>

All class activities and discussions are organized around a central theme to develop connections between disciplines. 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
- 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; it is particularly recommended for students interested in Education, Communication, or Pre-Law Studies, and for deciding students. 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/dept/integr8. The Program’s office is located on the 2nd floor of O’Kelly Hall, Room 253, on the University campus.

**Interdisciplinary Studies (IDS)**

**Thorp (Director)**

The Interdisciplinary Studies program offers students a unique opportunity to pursue a major that combines courses from two or more disciplines. The program fosters learning, scholarship, and discovery and allows students to take advantage of new and emerging fields and topics of study. The University of North Dakota is fortunate to have faculty with sufficient breadth and depth of knowledge to provide a foundation for interdisciplinary studies. Students can take charge of their own education by designing a plan of study focusing on a topic of interest, in consultation with an adviser and with the consent of the Director of Interdisciplinary Studies and the program’s executive committee. In these individualized tracks, students will undertake an in-depth study of a topic area of their choice that synthesizes information and research from two or more disciplines. Examples of such tracks include Photography, Health Sciences, and Environmental Studies. General requirements for the major are described below. Interested individuals should contact the Director of Interdisciplinary Studies in O’Kelly Hall, Room 129 (phone: 701-777-2613; e-mail: ids@und.nodak.edu). Information on the Program is also available online at: http://www.und.edu/dept/ids/

In addition, Women Studies and Peace Studies are long-established programs at the University of North Dakota. These programs are described elsewhere in this catalog, but the major for both programs is administered through Interdisciplinary Studies. Students may choose to earn the B.A. in Interdisciplinary Studies: Women Studies or the B.A. in Interdisciplinary Studies: Peace Studies. Contact the respective directors of those programs for further information.

**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. General Education 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 credits)
- IDS 490 Senior Project (1-3 credits, not repeatable)
- IDS 498 Independent Study (3, repeatable to 6 credits)

The remainder of the 36 credits will be chosen from appropriate specified disciplines, including 12 or more hours from one discipline.

**Courses**

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

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. F,S,SS

491. Capstone Interdisciplinary Seminar. 1-3 credits, not repeatable. Prerequisite: IDS 498. 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.

495. Service and Citizenship. 3 credits. Prerequisite: Junior or Senior standing. 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 volunteering 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. F,S,SS

498. Senior Project. 3 credits, repeatable to 6 credits. Prerequisite: IDS 280. Corequisite: IDS 491. 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. F,S

**International Studies (A&S)**

The Related Fields Concentration in International Studies 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 in 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. Thus, students will be required to work closely with their academic advisers to plan the best possible programs within the possibilities provided by the Related Fields Concentration.

**College of Arts and Sciences**

**B.A. WITH MAJOR IN INTERNATIONAL 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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

A. Total of 30 credits plus language requirement:
- Geog 161: World Regional Geography (3)
- Pols 220: International Politics (3)
- Anth 171: Cultural Anthropology (3)
- Hist 102: Western Civilization II (3)
- Rels 203: World Religions (3)

B. Three (3) credits from the following, or a substitute course, which is non-Western in its primary orientation, with permission from the International Studies Academic Adviser:
- Hist 106: Middle Eastern Civilization (3)
- Hist 362: Modern Chinese Civilization (3)
- Rels 203: World Religions (3)

C. Nine credits of upper division courses in an international concentration or a modern language. These nine credits should be chosen in consultation with the International Studies Academic Adviser to assure that the classes are related and form a cohesive unit. Independent studies, readings, internships, and foreign exchange programs are some ways that this nine-credit requirement may be fulfilled. Study abroad is strongly encouraged.

D. Language: Level IV Proficiency and an additional three hours in the language of proficiency.

INTERNATIONAL STUDIES MINOR

I. Required Courses:
- Geog 161: World Regional Geography (3)
- Pols 220: International Politics (3)
- Anth 171: Cultural Anthropology (3)
- Hist 102: Western Civilization II (3)
- Rels 203: World Religions (3)

II. Three (3) credits from the following, or a substitute course, which is non-Western in its primary orientation, with permission from the International Studies Academic Adviser:
- Hist 106: Middle Eastern Civilization (3)
- Hist 362: Modern Chinese Civilization (3)
- Rels 203: World Religions (3)

III. The minor must contain at least three credits of upper division coursework which may come from additional courses or from substitution for one of the above courses with the approval of the International Studies Academic Adviser.

IV. Other courses may be substituted only with the consent of the International Studies Academic Adviser.

V. Language required: Level III proficiency. University of North Dakota

Languages: Department of Modern and Classical Languages & Literatures

(Lang)

Benoit, Berne, Berry, Berwald, DuBois, Erickson, Fleshman (Chair), Koprince, Maury, Nelson and Routon

The Department of Modern and Classical Languages and Literatures offers study in Chinese, French, German, Latin, Norwegian, Russian, and Spanish. See Indian Studies 250 and 251 for study of Native American languages of North Dakota. Students may elect Classical Studies, French, German, Norwegian, or Spanish as their major field of study. Minors are offered in Chinese Studies, Classical Studies, French, German, Norwegian, Russian, and Spanish.

Course work 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 study abroad 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 General Education Requirement. See University GER listing.

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

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. General Education Requirements (see University GER listing).

II. Major Curriculum Listed Under Specific Language.

MINOR IN A LANGUAGE

I. Minor curriculum listed under specific language.

College of Arts & Sciences

B.A. WITH A MAJOR IN A 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:
- History 101: Western Civilization I (3)
- History 102: Western Civilization II (3)

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)

IV. Admission to the Teacher Education program, normally while taking T&L 325. (See College of Education and Human Development for admission and licensing requirements.)

V. The program in Secondary Education, to include:
- T&L 252: Child Development (3)
- T&L 325: Exploring Teaching in Secondary Schools (3)
- T&L 345: Curriculum Development and Instruction (3)
- T&L 386: Field Experience (Optional) (1)
- T&L 390: Special Topics (supervised by Languages department faculty) (1-3)
- Lang 400: Methods and Materials of Teaching Middle and Secondary School Foreign Languages (3)
- T&L 433: Multicultural Education (3)
- T&L 460: Microteaching (3)
- T&L 486: Field Experience (1)
- T&L 487: A full semester of student teaching, normally taken during the semester of graduation (16)

T&L 488: Senior Seminar (1)

Language majors seeking teacher licensure must have an adviser in both the Languages Department and the Department of Teaching and Learning.
### CLASSICAL STUDIES

**B.A. WITH A MAJOR IN CLASSICAL STUDIES**

Required: 36 credits distributed between Parts A and B as follows:

<table>
<thead>
<tr>
<th>I. General Education Requirements (see University GER listings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A: Language requirement (16 credits)</td>
</tr>
<tr>
<td>A student may fulfill the language requirement in one of three ways:</td>
</tr>
<tr>
<td><strong>Option 1, Latin:</strong></td>
</tr>
<tr>
<td>CLAS 101 First Year Latin I ............................................ (4)</td>
</tr>
<tr>
<td>CLAS 102 First Year Latin II .............................................. (4)</td>
</tr>
<tr>
<td>CLAS 201 Second Year Latin I .............................................. (4)</td>
</tr>
<tr>
<td>CLAS 202 Second Year Latin II ............................................ (4)</td>
</tr>
<tr>
<td><strong>Option 2, Greek:</strong></td>
</tr>
<tr>
<td>CLAS 151 First Year Greek I ................................................ (4)</td>
</tr>
<tr>
<td>CLAS 152 First Year Greek II ............................................... (4)</td>
</tr>
<tr>
<td>CLAS 251 Second Year Greek I ............................................... (4)</td>
</tr>
<tr>
<td><strong>Option 3, Greek and Latin:</strong></td>
</tr>
<tr>
<td>CLAS 101 First Year Latin I ................................................. (4)</td>
</tr>
<tr>
<td>CLAS 102 First Year Latin II ............................................... (4)</td>
</tr>
<tr>
<td>CLAS 151 First Year Greek I ................................................ (4)</td>
</tr>
<tr>
<td>CLAS 152 First Year Greek II ................................................ (4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part B: Courses in classical civilization, literature, culture (20 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The remaining 20 credits should be chosen from the following. A minimum of 15 credits must be at the 300 level or above.</td>
</tr>
<tr>
<td><strong>ART 420</strong> Greek and Roman Art ................................................. (3)</td>
</tr>
<tr>
<td><strong>CLAS 185</strong> Introduction to Classical Mythology ................................ (3)</td>
</tr>
<tr>
<td><strong>CLAS 301</strong> Latin Prose ................................................................... (3)</td>
</tr>
<tr>
<td><strong>CLAS 362</strong> Masterpieces of Latin Literature .................................... (3)</td>
</tr>
<tr>
<td><strong>CLAS 364</strong> Special Topics in Classical Literature ............................ (3)</td>
</tr>
<tr>
<td><strong>CLAS 404</strong> Latin Poetry ................................................................ (3)</td>
</tr>
<tr>
<td><strong>HIST 101</strong> Western Civilization I ................................................ (3)</td>
</tr>
<tr>
<td><strong>HIST 343</strong> Ancient Greece ......................................................... (3)</td>
</tr>
<tr>
<td><strong>HIST 344</strong> Ancient Rome ............................................................. (3)</td>
</tr>
<tr>
<td><strong>HIST 345</strong> The Ancient Near East ................................................ (3)</td>
</tr>
<tr>
<td><strong>HUM 102</strong> Introduction to the Humanities II .................................... (4)</td>
</tr>
<tr>
<td><strong>PHIL 300</strong> Classical Greek and Hellenistic Philosophy .......................... (3)</td>
</tr>
<tr>
<td><strong>PHIL 301</strong> Medieval Philosophy ................................................... (3)</td>
</tr>
<tr>
<td><strong>POLS 310</strong> Introduction to Political Thought ..................................... (3)</td>
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<tr>
<td><strong>RELS 228</strong> Early Christian Traditions ............................................ (3)</td>
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<tr>
<td><strong>RELS 230</strong> New Testament ............................................................ (3)</td>
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<tr>
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</tr>
<tr>
<td><strong>Additional 100- and 200-level Latin courses, other than those used to satisfy Part A</strong>:</td>
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<tr>
<td><strong>Additional 100- and 200-level Greek courses, other than those used to satisfy Part A</strong>:</td>
</tr>
<tr>
<td>Other courses as approved by Classical Studies adviser.</td>
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<tr>
<td>*i.e. a student may not use the same courses to satisfy Part A and Part B.</td>
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</tbody>
</table>

### MINOR IN CLASSICAL STUDIES

Required: 28 credits distributed between Parts A and B as follows:

<table>
<thead>
<tr>
<th>Part A: Language requirement (16 credits)</th>
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<tbody>
<tr>
<td>A student may fulfill the language requirement in one of three ways:</td>
</tr>
<tr>
<td><strong>Option 1, Latin:</strong></td>
</tr>
<tr>
<td>CLAS 101 First Year Latin I .................. (4)</td>
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<tr>
<td>CLAS 102 First Year Latin II ................. (4)</td>
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<tr>
<td>CLAS 201 Second Year Latin I ................. (4)</td>
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<tr>
<td>CLAS 202 Second Year Latin II ................ (4)</td>
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<tr>
<td><strong>Option 2, Greek:</strong></td>
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<tr>
<td>CLAS 151 First Year Greek I .................. (4)</td>
</tr>
<tr>
<td>CLAS 152 First Year Greek II ................. (4)</td>
</tr>
<tr>
<td>CLAS 251 Second Year Greek I ................ (4)</td>
</tr>
<tr>
<td>CLAS 252 Second Year Greek II ............... (4)</td>
</tr>
<tr>
<td><strong>Option 3, Greek and Latin:</strong></td>
</tr>
<tr>
<td>CLAS 101 First Year Latin I .................. (4)</td>
</tr>
<tr>
<td>CLAS 102 First Year Latin II ................. (4)</td>
</tr>
<tr>
<td>CLAS 151 First Year Greek I .................. (4)</td>
</tr>
<tr>
<td>CLAS 152 First Year Greek II ................. (4)</td>
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</tbody>
</table>

<table>
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<tr>
<th>Part B: 12 credits are to be selected from the courses listed below — 9 of these credits must be at the Upper Division level (300 or above).</th>
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</thead>
<tbody>
<tr>
<td><strong>ART 420</strong> Greek and Roman Art ................................................................ (3)</td>
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<tr>
<td><strong>CLAS 185</strong> Introduction to Classical Mythology ......................................................... (3)</td>
</tr>
<tr>
<td><strong>CLAS 301</strong> Latin Prose .............................................................................. (3)</td>
</tr>
<tr>
<td><strong>CLAS 362</strong> Masterpieces of Latin Literature ......................................................... (3)</td>
</tr>
<tr>
<td><strong>CLAS 364</strong> Special Topics in Classical Literature ................................................... (3)</td>
</tr>
<tr>
<td><strong>CLAS 404</strong> Latin Poetry ............................................................................. (3)</td>
</tr>
<tr>
<td><strong>HIST 101</strong> Western Civilization I ........................................................................... (3)</td>
</tr>
<tr>
<td><strong>HIST 301</strong> Medieval Civilization ............................................................................ (3)</td>
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</table>

### MODERN LANGUAGES

**Chinese Courses (Chin)**

| 101. First Year Chinese I ................................................. (4) |
| 102. First Year Chinese II .................................................. (4) |
| 201. Second Year Chinese I .................................................. (4) |

**Japanese Courses (Jpn)**

| 101. First Year Japanese I ................................................... (4) |
| 102. First Year Japanese II .................................................... (4) |
| 201. Second Year Japanese I .................................................... (4) |

**Korean Courses (Kor)**

| 101. First Year Korean I ....................................................... (4) |
| 102. First Year Korean II ....................................................... (4) |
| 201. Second Year Korean I ....................................................... (4) |
French

A B.A. with a major in French requires a minimum of 21 credits with at least 6 credits in each of the following areas: Grammar & Writing (Fren 301, 302, 413); Literature & Civilization (Fren 371, 372, 373, 491, 494); Culture & Conversation (Fren 304, 305, 306, 307, 340, 491, 494). The following courses are required: Fren 301, 302, 304, 305, 306.

A French minor consists of Fren 301, 302, 304, 305, 306 and a minimum of 2 additional credit hours selected from Upper Division courses for a total of 14 credits.

Students interested in business may obtain a minor in French by taking Fren 301, 305, 306, 340 and a minimum of 4 additional credits of Upper Division courses for a total of 14 credits.

Study abroad is encouraged; scholarships are available through the Department. All majors are required to take on campus a minimum of 3 hours in each of the three areas (see above), regardless of the number of credits acquired through transfer, including study abroad. All minors are required to take on campus a minimum of 3 hours in at least two of the areas (see above).

Courses (Fren)

102. First Year French II. 4 credits. Prerequisite: Fren 101 with a grade of C or better. Continued study of fundamentals of French grammar, oral use of the language and reading of easy French. F, S
201. Second Year French I. 4 credits. Prerequisite: Fren 102, or equivalent. Review of the structure of the language; readings in French, practice in oral and written expression. F
202. Second Year French II. 4 credits. Prerequisite: Fren 201 or equivalent. Review of the structure of the language; readings in French, practice in oral and written expression. S
301. Third Year French. 3 credits. Prerequisite: Fren 202 or equivalent. Grammar review and introduction to literature. Emphasis on reading and writing skills. F
302. Third Year French. 3 credits. Prerequisite: Fren 301 or equivalent. Grammar review and introduction to literature. Emphasis on reading and writing skills. S
304. French Phonetics. 2 credits. Prerequisite: Fren 201. A practical approach to the pronunciation and intonation of the French language. F
306. French Conversation and Culture. 2 credits. Prerequisite: Fren 202 or consent of instructor. A conversational approach to civilization and contemporary culture. Emphasis on oral skills. F
307. A Social and Cultural History of Québec. 3 credits. Prerequisites: Fren 202 or consent of instructor. This course focuses on the topics of geography, history, language, ideology, politics, and religion in their relationship to architecture, painting, popular crafts, song, film, and literature in Québec. On demand.
312. Topics in Chinese Culture. 3 credits. Prerequisite: Consent of instructor or French 305. On demand.
318. Individually Arranged Study Abroad. 1-12 credits,-repeatable to 12. Prerequisite: Permission of Department. 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. S/U grading only. On demand.

German

A major in German for the Bachelor of Arts (B.A.) degree includes a minimum of 21 semester credit hours of Upper Division (Germ 300-400) course work: Germ 307, 308, 407, 408, and three additional courses (Germ 304, 312, 403, 404, 406, 409, 413, LANG 318 or 319). In addition, at least eight credit hours of course work in fields related to German approved by the faculty adviser in Languages are required.

A minor in German consists of at least twelve credit hours: Germ 307, 308, and two additional courses (Germ 304, 312, 407, 408, LANG 318 or 319).

Students interested in business may obtain a minor in German by completing Germ 307, 308, and one additional course (Germ 304, 312, LANG 318 or 319).

Majors and minors are encouraged to make their interests known, including interest in studying in a German-speaking area in Europe, for which UND may grant academic credit. In addition to the departmental Arneberg and the Larsen scholarships awarded to students in several languages including German, the Max Kade, Stoltz and Rogers scholarships and the Boswau Endowment Fund are awarded exclusively to qualified students of German.

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
102. First Year German II. 4 credits. Prerequisite: German 101 with a grade of C or better. Continued study of fundamentals of German grammar, oral use of the language and reading of easy German. F, S
201. Second Year German I. 4 credits. Prerequisite: German 102, or equivalent. Review of the structure of the language, practice in oral and written expression. F
202. Second Year German II. 4 credits. Prerequisite: German 201 or equivalent. Review of the structure of the language, practice in oral and written expression and reading in German. S
301. Third Year German. 3 credits. Prerequisite: German 202 or equivalent. Grammar review and introduction to literature. Emphasis on reading and writing skills. F
304. German Phonetics. 2 credits. Prerequisite: German 201. A practical approach to the pronunciation and intonation of the German language. On demand.
306. German Conversation and Culture. 2 credits. Prerequisite: German 202 or consent of instructor. A conversational approach to civilization and contemporary culture. Emphasis on oral skills. F
307. A Social and Cultural History of Germanic Europe. 3 credits. Prerequisites: German 202 or consent of instructor. This course focuses on the topics of geography, history, language, ideology, politics, and religion in their relationship to architecture, painting, popular crafts, song, film, and literature in Germanic Europe. On demand.
312. Topics in German Culture. 3 credits. Prerequisite: German 202 or equivalent. A study of various aspects of German culture through the centuries. S
318. Individually Arranged Study Abroad. 1-12 credits,-repeatable to 12. Prerequisite: Permission of Department. Participation in individually arranged pro-
grams 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. S/U grading only. On demand.

L 201. First Year Russian I. 4 credits. Introduction to the basic Russian language skills: reading, writing, speaking, and listening; fundamentals of grammar. F

202. First Year Russian II. 4 credits. Prerequisite: R uss 101 with a grade of C or better. Basic Russian language skills; continuation of fundamentals of grammar. S

201. Second Year Russian I. 4 credits. Prerequisite: Russ 102 or equivalent. Selected cultural and literary readings, review of the structure of the language, and continued development of readings, writing, speaking, and listening skills. F

202. Second Year Russian II. 4 credits. Prerequisite: Russ 201 or equivalent. Selected cultural and literary readings, continued review of the structure of the language and development of language skills. S

L 318. Individually Arranged Study Abroad. 1-12 credits, repeatable to 12. Prerequisite: Permission of Department. 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. S/U grading only. On demand.

L 343. Indonesian Literature. 3 credits. Prerequisite: Russ 200. Indonesian literature, with special attention given to recognized masterpieces, past and present. F

401. Norwegian Literature. 3 credits. Prerequisite: Norw 202. Norwegian literature with special attention given to recognized masterpieces, past and present. S

401. Individual Norwegian Readings. 1-3 credits. May be repeated to a total of six hours. Prerequisite: Norw 308 or equivalent. May be taken only with the consent of the department. F/S

Norwegian A major in Norwegian includes the following Upper Division courses: Norw 431, 432, 433, 434; a minimum of 8 credit hours selected from Norw 403 and 494; and at least 8 credit hours of approved course work in related fields.

A minor in Norwegian requires 9 credits selected from Norw 431, 432, 433, and 434, plus a minimum of one additional credit hour in Upper Division Norwegian courses.

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

102. First Year Norwegian II. 4 credits. Prerequisite: Norw 101 with a grade of C or better. Basic Norwegian language skills; continuation of fundamentals of grammar. S

201. Second Year Norwegian I. 4 credits. Prerequisite: Norw 102 or equivalent. Selected cultural and literary readings, review of the structure of the language, and continued development of readings, writing, speaking, and listening skills. F

202. Second Year Norwegian II. 4 credits. Prerequisite: Norw 201 or equivalent. Selected cultural and literary readings, continued review of the structure of the language and development of language skills. S

L 318. Individually Arranged Study Abroad. 1-12 credits, repeatable to 12. Prerequisite: Permission of Department. 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. S/U grading only. On demand.

L 343. Norwegian Literature. 3 credits. Prerequisite: Norw 202. Norwegian literature with special attention given to recognized masterpieces, past and present. F

401. Individual Norwegian Readings. 1-3 credits. May be repeated to a total of six hours. Prerequisite: Norw 308 or equivalent. May be taken only with the consent of the department. F/S

Russian A minor in Russian includes Russ 301 and 302, plus a minimum of four additional credit hours from among: Russ 161, 162, 494, Lang 318 or 319. With the permission of the department, other relevant courses may be elected to fulfill the requirements for a minor in Russian.

Courses (Russ)

101. First Year Russian I. 4 credits. Fundamentals of Russian grammar, oral use of the language and reading of easy Russian. F

102. First Year Russian II. 4 credits. Prerequisite: Russian 101 with a grade of C or better. Continued study of fundamentals of Russian grammar, oral use of the language and reading of easy Russian. S

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.

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.

201. Second Year Russian I. 4 credits. Prerequisite: Russian 202 or equivalent. Review of the structure of the language, readings in Russian, practice in oral and written expression. F

202. Second Year Russian II. 4 credits. Prerequisite: Russian 201 or equivalent. Review of the structure of the language, readings in Russian, practice in oral and written expression. S

301. Third-Year Russian. 3 credits. Prerequisite: Russian 202 or equivalent. Intensive oral drill, short readings, systematic review of grammar. Emphasis on developing a practical command of spoken Russian. F

302. Third-Year Russian. 3 credits. Prerequisite: Russian 301 or equivalent. Intensive oral drill, short readings, systematic review of grammar. Emphasis on developing a practical command of spoken Russian. S

394. Independent Study. 1-3 credits, repeatable to 6 credits. Prerequisites: Russian 202 or equivalent. Supervised independent study. May be taken only with consent of instructor. F/S

494. Individual Russian Readings. 1-3 credits. Prerequisite: Russian 302 or equivalent. May be repeated to a total of six hours. May be taken only with the consent of the department. F/S

Spanish

A major in Spanish includes the following courses beyond Lower Division work: Span 304 or 450, 307, 308, 309, 310, 311, 414 or 416; three courses from Span 420, 421, 422, 423; and a minimum of six credit hours selected from other Upper Division courses, of which at least three credit hours must be at the 400 level.

A major in Spanish with a field in teaching includes the following courses beyond Lower Division work: Span 304, 307, 308, 309, 310, 311, 450; three courses from Span 420, 421, 422, 423; and a minimum of six credit hours selected from other Upper Division courses (300-400 level).

A Spanish minor consists of Span 308, 309, 310 or 311 and a) 307 and 4xx literature, or b) 304 and 450.

Courses (Span)

101. First Year Spanish I. 4 credits. Pronunciation and fundamental grammatical principles introduced through the development of skill and listening comprehension and speaking, followed by practice in reading and writing. F

102. First Year Spanish II. 4 credits. Prerequisite: Span 101 with a grade of C or better. 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. S

201. Second Year Spanish I. 4 credits. Prerequisite: Span 102 or equivalent. Review of the structure of the language, readings in Spanish, practice in oral and written expression. F

202. Second Year Spanish II. 4 credits. Prerequisite: Span 201 or equivalent. Review of the structure of the language, readings in Spanish, practice in oral and written expression. S

304. Spanish Phonetics. 3 credits. Prerequisite: Span 202 or equivalent or permission of instructor. A scientific approach to the pronunciation and enunciation of Spanish. On demand.

307. Literary Analysis. 3 credits. Prerequisite: Span 202 or equivalent or permission of instructor. An introduction to the analysis of Hispanic literature, with particular emphasis on poetry, novel, and drama. On demand.

308. Spanish Conversation. 3 credits. Prerequisite: Span 202 or equivalent. Practice in a variety of forms of oral Spanish. F

309. Spanish Composition. 3 credits. Prerequisite: Span 202 or equivalent. Practice in a variety of forms of written Spanish. S

310. Spanish Civilization and Culture. 3 credits. Prerequisite: Span 202 or equivalent or permission of instructor. Readings, lectures and discussions in Spanish civilization and culture. On demand.

311. Spanish American Civilization and Culture. 3 credits. Prerequisite: Span 202 or equivalent or permission of instructor. Readings, lectures and discussions in Spanish American civilization and culture. On demand.
312. Spanish for the Professions. 3 credits. Prerequisites: Span 202 or equivalent and permission of the instructor. A study of specific terminologies used in a variety of professions, a continuing review of basic language skills and instruction in Hispanic professional etiquette. On demand.

Lang 318. Individually Arranged Study Abroad. 1-12 credits, repeatable to 12. Prerequisite: Permission of department. 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. S/U grading only. On demand.

Lang 319. University Sponsored Study Abroad. 1-12 credits, repeatable to 12. Prerequisite: Lang 102 or equivalent. 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. On demand.

410. Cervantes and the Golden Age. 3 credits. Prerequisite: Span 420 or 421 or permission of instructor. A study of the works of Cervantes and his contemporaries. Topic will vary. Repeatable with new topic. On demand.

411. Modern Spanish American Novel. 3 credits. Prerequisite: Span 422 or 423 or permission of instructor. Readings in the 20th-Century novel of Spanish America. With lectures. On demand.

414. Topics in Spanish American Literature. 3 credits. Prerequisite: Span 420 or 421 or permission of instructor. Selected topics dealing with author, period, movement or genre of peninsular literature excluding the Golden Age. Repeatable with different topic. On demand.

416. Topics in Spanish American Literature. 3 credits. Prerequisite: Spanish 422 or 423 or permission of instructor. Topics, on an alternating basis, include: Pre-Columbian Literature and Culture, Boom and Postboom Narrative, Chronicles of the Conquest, Modernismo, 19th-Century Novel, Novel of the Mexican Revolution. Repeatable with different topic. On demand.

420. History of Spanish Literature, Beginnings-1681. 3 credits. Prerequisite: Span 307. A study of the development of the peninsular literary tradition from the Middle Ages to 1681, with lectures, readings, and analysis of representative texts. F

421. History of Spanish Literature, 1681-Present. 3 credits. Prerequisite: Span 307. A study of the development of the peninsular literary tradition from 1681 to the present, with lectures, readings and analysis of representative texts. S

422. History of Spanish American Literature, Conquest-Independence. 3 credits. Prerequisite: Span 307. Literature of the Spanish American countries written in the Spanish language, from the Conquest to the Independence. With lectures, readings, and discussion. F

423. History of Spanish American Literature, Independence-Present. 3 credits. Prerequisite: Span 307. Literature of the Spanish American countries written in the Spanish language, from Independence to the present. With lectures, readings, and discussion. S

450. Advanced Spanish Grammar. 3 credits. Prerequisite: Span 309 or permission of instructor. 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. On demand.

461. Seminar in Hispanic Linguistics. 3 credits. Prerequisite: Spanish 304 or 450 or permission of instructor. Advanced work in a variety of alternating topics related to Hispanic linguistics such as syntax, morphology, dialectology, and history of the Spanish language. Repeatable with different topic. On demand.

462. Seminar in Hispanic Literature and Culture. 3 credits. Prerequisite: Span 420, 421 or 423 depending on topic or permission of instructor. Advanced work on a specific aspect of the Hispanic literary and cultural tradition. Repeatable with different topic. Subject to review by Spanish faculty. On demand.

494. Individual Hispanic Readings. 1 to 3 credits. Prerequisite: Span 307 or equivalent. May be repeated to a total of six hours. May be taken only with the consent of the department. F,S

NON-LANGUAGE SPECIFIC COURSES (Lang)

207. Introduction to Linguistics. 3 credits. An introduction to the nature of language, phonology, grammar, semantics, and history, geographical, social and educational aspects of language. Same course as Engl 209.

250. Topics in World Languages and Cultures. 1-4 credits. Repeatable with change in topic. Beginning or intermediate instruction on subjects not covered by regular departmental offerings. No prerequisite unless one is specifically announced in the Time Schedule. On demand.

318. Individually Arranged Study Abroad. 1-12 credits, repeatable to 12. Prerequisite: Permission of Department. 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. S/U grading only. On demand.

319. University Sponsored Study Abroad. 1-12 credits, repeatable to 12. Prerequisite: Lang 102 or equivalent. 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. On demand.

331. Foreign Literature in Translation. 1 to 3 credits, may be repeated to a maximum of 6 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. F, S

333. Colloquium in Language and Letters. 1 to 3 credits, may be repeated to a maximum of 12 hours of which no more than 2 hours may result from participation in the French Manitoba Program. 333a. regular grading; 333b. S/U grading. Prerequisites: Language 102 or equivalent. Special subjects to be announced. F, S

389. Honors Tutorial. 2 to 4 credits. Prerequisites: Language 302 or equivalent and consent of the department. Supervised independent study of topics of mutual interest to students and members of the departmental faculty. May apply toward graduation with Senior Honors. On demand.

397. Cooperative Education in Language. 1-6 credits, repeatable to 6. Prerequisites: Recommended study of language unit and approval of Department. Compensated and practical work experience in various areas of the language of study. Coop credits may not be substituted for any required course. S/U grading only. F,S,SS

408. Methods and Materials of Teaching Middle and Secondary School Foreign Language. 3 credits. Prerequisites: T&L 325 and T&L 345; Corequisite: T&L 486. Various teaching methods, strategies and materials used in teaching middle and secondary school foreign language. F

409. Senior Honors Thesis. 1 to 15 credits; total not to exceed fifteen. Prerequisite: consent of the Department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F, S

Linguistics (Ling)

Linguistics courses are taught through a cooperative program between UND and SIL. International during a nine-week summer session. Introductory courses are at the undergraduate level, and advanced courses are at the graduate level. While the University currently has no undergraduate degree program in linguistics, it is possible for students to have a concentration in languages and linguistics as English majors, and an undergraduate minor in linguistics is in the process of being developed (contact SIL or the English department for its current status).

Students wishing to take SIL courses should apply directly to SIL, preferably by April 15 (April 1 for non-U.S. citizens). Application and other information is available at: http://www.und.nodak.edu/dept/linguistics/; 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). During the summer, further information is available from the SIL office on campus (777-0575).

Other departments also offer undergraduate courses relevant to linguistics, especially CSD, English and Languages.

Courses

450. Articulatory Phonetics. 2 credits. Introduction to the theory and practice of articulatory phonetics. SS

451. Phonology I. 3 credits. Prerequisite or corequisite: Lng 450. Introduction to phonological analysis; intensive practice in applying theoretical principles to problem solving and to field techniques. SS

452. Syntax and Morphology. 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

460. Ethnographic Methods in Field Linguistics. 3 credits. Orientation on cultural anthropology and ethnographic research methods for the field linguist, with special attention to the interaction between language and culture. SS

470. Introduction to Sociolinguistics. 2 credits. Introduction to language as a social phenomenon dependent on age, gender, social class, status, setting, and topic, with special attention to multilingual societies. SS

480. Language Acquisition Theory and Practice. 3 credits. Equips the student for success in self-directed learning of language and culture through working one-on-one with a native speaker of another language. Includes individual mentoring, and discussion of strategies, theoretical principles, and the second language acquisition literature. SS

Management (Mgmt)

Francis, Helleloid (Chair), Hollingworth, Moser, Nam, Park, Patton, Schultz, Vitton

The mission of the Department of Management is to provide practical and innovative management courses for undergraduate man-
agement and other business majors and graduate students. The Department of Management is a part of the College of Business and Public Administration. Students will be exposed to current information concerning the study and practice of business. This information will aid students in developing managerial skills and will prepare them for advanced business studies. The importance of ethical business practices will be stressed in the delivery of the information. The faculty is dedicated, motivated, caring, experienced, and academically or professionally qualified, and will search out and use current instructional resources and methods. The faculty also engages in basic, applied, and/or instructional research and provides service to the University, business, professional, and local communities.

The Department of Management offers a comprehensive undergraduate program in 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. In developing an understanding of the interrelationships between the various management functions and the environment, emphasis is placed upon analytical problem solving, establishing strategies and policies, human relations, and general management principles. The curriculum also provides the student with a substantial choice of electives in business administration courses. The student majoring in management is prepared to choose from a variety of career opportunities in private and public organizations.

College of Business and Public Administration

B.B.A. WITH MAJOR IN MANAGEMENT

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. General Education Requirements (see University GER listing).
II. The College of Business and Public Administration Requirements, see BPA listing.
III. The Following Curriculum: (Suggested Sequence)

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng 110, 120</td>
<td>College Composition I, II .................. (3)</td>
<td>(3)</td>
</tr>
<tr>
<td>Pol 115</td>
<td>American Government I .......................... (3)</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 103</td>
<td>College Algebra ................................ (3)</td>
<td>(3)</td>
</tr>
<tr>
<td>Psy 111</td>
<td>Introduction to Psychology .................... (3)</td>
<td>(3)</td>
</tr>
<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking ............... (3)</td>
<td>(3)</td>
</tr>
<tr>
<td>Soc 110</td>
<td>Introduction to Sociology ........................ (3)</td>
<td>(3)</td>
</tr>
<tr>
<td>or Anth 171</td>
<td>Introduction to Cultural Anthropology .......... (3)</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 146</td>
<td>Applied Calculus I .............................. (3)</td>
<td>(3)</td>
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<tr>
<td></td>
<td>Arts and Humanities ................................... (3)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Sophomore Year

| Econ 201      | Principles of Microeconomics .................. (3) | (3) |
| Econ 202      | Principles of Macroeconomics ................... (3) | (3) |
| Acc 200, 201 | Elements of Accounting I & II .................. (3) | (3) |
| Econ 210      | Introduction to Business and Economic Statistics (3) | (3) |
| ISys 117      | Information Technology .......................... (1) | (4) |
| Lab Science   | Arts and Humanities ................................ (3) | (3) |

Junior Year

| Acct 315      | Business in the Legal Environment ............. (3) | (3) |
| Econ 303      | Money and Banking ................................ (3) | (3) |
| ISys 317      | Information Systems in Enterprise ............. (3) | (3) |
| Mgmt 300     | Principles of Management ........................ (3) | (3) |
| Mgmt 301     | Operations Management ........................... (3) | (3) |
| Mkt 305      | Marketing Foundations ............................ (3) | (3) |
| ISBE 320      | Professional Communication for Business ....... (3) | (3) |
| Fin 310       | Principles of Financial Management ............. (3) | (3) |
| Mgmt 302     | Human Resource Management ........................ (3) | (3) |

Mgmt 309 .......... Quantitative Methods for Managers . (3)
Mgmt 310 .......... Organizational Behavior . (3)

Senior Year

| Mgmt 400 ....... Organizational Theory and Analysis (3) | (3) |
| Mgmt 475 ....... Strategic Management . (3) | (3) |

Plus Major Electives Requirements: Minimum of nine elective credits from the following:

6 credits from the following list:

| Ent 385 . Venture Initiation ............................ (3) | (3) |
| Mgmt 395 . Special Topics ............................. (3) | (3) |
| Mgmt 407 . Wage and Salary Administration .............. (3) | (3) |
| Mgmt 408 . Issues in Human Resource Management ...... (3) | (3) |
| Mgmt 409 . Union Management Relations ................. (3) | (3) |
| Mgmt 410 . Staffing, Recruitment and Selection ........ (3) | (3) |
| Mgmt 412 . Training and Development ................... (3) | (3) |
| Mgmt 420 . Multinationa1 Management ................... (3) | (3) |
| Mgmt 431 . Supply Chain Management .................... (3) | (3) |
| Mgmt 432 . Supplier Relationship Management .......... (3) | (3) |

3-4 credits from the following list:

| Acct 301 . Intermediate Accounting I .................. (4) | (4) |
| ISys 305 . End-User Applications ........................ (3) | (3) |
| ISys 308 . Information Resource Administration ........ (3) | (3) |
| ISys 315 . Records and Information Management .......... (3) | (3) |
| Econ 308 . Intermediate Microeconomic Theory ............. (3) | (3) |
| Econ 309 . Intermediate Macromconomic Theory ............. (3) | (3) |
| Econ 341 . Labor Economics and Labor Relations .......... (3) | (3) |
| Fin 360 . Capital Market Financing and Investment Strategies . (3) | (3) |
| Mrkt 310 . Consumer Behavior ............................ (3) | (3) |
| Mrkt 315 . Retail Management ............................ (3) | (3) |
| Mrkt 330 . Marketing Research ........................... (3) | (3) |
| Mgmt 397 . Cooperative Education in Management .......... (1-3) | (1-3) |

Plus 14 hours of non-business electives and 10 hours of business or non-business electives to bring the total hours to 125.

IV. Transfer credit is not allowed for Mgmt 475, Strategic Management, the capstone course for business degree programs at UND.

Courses

300. Principles of Management. 3 credits. Prerequisites or Corequisites: Acct 201, Econ 202 and 210; Sophomore, Junior or Senior Standing; minimum total of 50 credit hours; declared and CoBPA majors only. 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. F, S

301. Operations Management. 3 credits. Prerequisites: Econ 210, Sophomore or Junior Standing and 2.5 GPA; declared CoBPA majors only. 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. F, S

302. Human Resource Management. 3 credits. Prerequisites: Econ 210 and Mgmt 300, Junior or Senior Standing; declared CoBPA majors only. 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. F, S

305. Managerial Concepts. 3 credits. Prerequisites: Junior or Senior Standing; not available to students in the College of Business and Public Administration. This course is designed to expose the student to a variety of concepts presented within the framework of the traditional functions of management. The various approaches to planning, decision making, organizing, motivating, work groups, authority, personnel staffing, leadership, change/conflict, communications, and controlling are explored in the context of supervisory personnel development. F, S

309. Quantitative Methods for Managers. 3 credits. Prerequisites: Econ 210; Mgmt 301; Junior or Senior Standing; declared CoBPA majors only. Topics include decision analysis, forecasting, linear programming (formulation, sensitivity analysis), integer and mixed programming, network models, queueing analysis, and simulation. F, S

310. Organizational Behavior. 3 credits. Prerequisites: Econ 210; Mgmt 300; Junior or Senior Standing; declared CoBPA majors only. 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. F, S
Marketing (MRKT)

Askim-Lovseth, Bateman, Elbert, Faircloth, Lesch (Chair) and Tangsrud

The Marketing department offers programs in preparation of careers in profit and non-profit organizations where skills in professional selling, promotion, research, distribution, and brand management are necessary. The undergraduate curriculum consists of a range of required and elective courses designed to establish core competencies in the field while also encouraging a choice of career focus. Virtually all coursework includes emphases on improving writing and speaking skills and the use of contemporary technology and analytical skills necessary to effective marketing managers. Students enjoy a range of opportunities for group projects, many with a hands-on element with live businesses, both in regular coursework and through internships and cooperative education. The American Marketing Association Student Chapter offers an opportunity to participate with local and regional marketing managers through speaker events and site visits.

The Department is also home to the recently dedicated Page Family Marketing Center, a suite of break-out rooms for small-group projects, a state-of-the-art computer lab and a conference room equipped for the conduct of focus groups. The Department faculty takes pride in the quality and currency of programming. Professors are regularly recognized for their excellence in the classroom as well as for the high quality of their applied research and service to regional and national firms and the quality of basic research published in the field of Marketing.

College of Business and Public Administration

B.B.A. WITH MAJOR IN MARKETING

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

I. General Education Requirements, (see University GER listing).

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 200, 201</td>
<td>Elements of Accounting I &amp; II</td>
<td>6</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>Isys 117</td>
<td>Personal Productivity with Information Technology</td>
<td>1</td>
</tr>
<tr>
<td>Isys 317</td>
<td>Information Systems in Enterprise</td>
<td>3</td>
</tr>
<tr>
<td>Acct 315</td>
<td>Business in the Legal Environment</td>
<td>3</td>
</tr>
<tr>
<td>Math 103,146</td>
<td>College Algebra, Applied Calculus I</td>
<td>6</td>
</tr>
<tr>
<td>Mgmt 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 301</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>Fin 310</td>
<td>Principles of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 475</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>Mkt 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>
</tr>
</tbody>
</table>

One course selected from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anth 171</td>
<td>Introduction to Cultural Anthropology</td>
</tr>
<tr>
<td>Psyc 111</td>
<td>Introduction to Psychology</td>
</tr>
<tr>
<td>Soc 110</td>
<td>Introduction to Sociology</td>
</tr>
</tbody>
</table>

Major in Marketing

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mkt 310</td>
<td>Consumer Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Mkt 325</td>
<td>International Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Mkt 330</td>
<td>Marketing Research</td>
<td>3</td>
</tr>
<tr>
<td>Mkt 450</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Complete at least 15 credits from the following:

No more than a total of 3 credits from Mkt 396, Mkt 397, and Mkt 497 may be used to satisfy this requirement.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mgmt 431</td>
<td>Supply Chain Management</td>
</tr>
<tr>
<td>Mkt 311</td>
<td>Professional Selling</td>
</tr>
<tr>
<td>Mkt 312</td>
<td>Advertising</td>
</tr>
<tr>
<td>Mkt 315</td>
<td>Retail Management</td>
</tr>
</tbody>
</table>
Courses

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 creating a systematic career planning process. Career planning prior to the senior year helps incorporate internships, job shadowing, and/or cooperative education into students’ program of study. Particular emphasis is placed on the application of the marketing concepts in professional career initiation and on the development and delivery of marketing presentations. The course also incorporates attitude testing, mock interviews, discussion of job search using the Internet, networking, time management strategies, and portfolio development. S

305. Marketing Foundations. 3 credits. Prerequisite: Econ 201. Prerequisites or Corequisites: Accct 201 and Econ 210; Sophomore, Junior or Senior Standing; minimum total of 50 credit hours; declared and pre-CoBPA majors only. An overview of the scope and nature of market exchange and the buyer’s pivotal role. F, S

310. Consumer Behavior. 3 credits. Prerequisites: Mrkt 305; Sophomore, Junior or Senior Standing; declared CoBPA majors only. 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. F, S

311. Professional Selling. 3 credits. Prerequisites: Mrkt 305; Sophomore, Junior or Senior Standing; declared CoBPA majors only. The professional selling process including prospecting, qualifying, need-discovery and development, relationship-building, presentations, handling objections, closing, and post-sale service. F, S

312. Advertising. 3 credits. Prerequisites: Mrkt 305; Sophomore, Junior or Senior Standing; declared CoBPA majors only. Introductory survey of the field of advertising with emphasis on institutions, practices, and salient aspects of advertising management. F

315. Retail Management. 3 credits. Prerequisites: Mrkt 305 and Accct 201; Sophomore, Junior or Senior Standing; declared CoBPA majors only. Application of marketing and financial principles to the planning and execution of retail management. Includes analyses of relevant institutions and interest group. F

325. International Marketing. 3 credits. Prerequisites: Mrkt 305; Sophomore, Junior or Senior Standing; declared CoBPA majors only. Survey of international business environment, with focus on elements of international marketing practices and their management. F

330. Marketing Research. 3 credits. Prerequisites: Mrkt 305 and Econ 210; Sophomore, Junior or Senior Standing; declared CoBPA majors only. 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. F, S

396. Directed Studies in Marketing. 1-3 credits. Prerequisites: Mrkt 310, and Consent of Instructor. Research in some aspect of marketing. Written reports and collateral readings. F, S

397. Cooperative Education in Marketing. 1-8 credits, repeatable only to maximum of 8 credits. Prerequisites: Mrkt 305 and consent of instructor. Compensated, on-the-job experience in various areas of marketing. SU格 grading only. F, S, SS

410. Sales Management. 3 credits. Prerequisites: Mrkt 305 and 311; Junior or Senior Standing; declared CoBPA majors only. The practice of sales management including sales force recruiting, training, organization, motivation, compensation, and evaluation. S

412. Promotional Strategy. 3 credits. Prerequisites: Mrkt 312; Junior or Senior Standing; declared CoBPA majors only. Relationship of marketplace activities to promotional processes; integration of promotional tools into marketing strategy. F

440. Special Topics in Marketing. 3 credits. Prerequisites: Mrkt 305; Junior or Senior Standing; declared CoBPA majors only. Investigation of selected topics of importance to the marketing of goods, services, or ideas. May be taken a maximum of two times for credit. S

450. Marketing Management. 3 credits. Prerequisites: Mrkt 305, 310, 325, and 330; Senior Standing; declared CoBPA majors only. Capstone course addressing the firm’s micro and macro environments from a strategic marketing decision making perspective. F, S

497. Internship in Marketing. 1-8 credits, repeatable only to maximum of 8. Prerequisites: 9 hours of Marketing, GPA of 2.75, and consent of instructor. Compensated, practical experience with selected participating firms. SU格 grading only. F, S

Mathematics (Math)

Bevelacqua, Collings, Dearden, Dunnigan, Gilsdorf, Halcrow, J. liams, M. liams, Khavanin, Metzger, Millsbaugh (Chair), Peterson, Richards, Takahashi and Zerr

The functions of the Mathematics Department within the total framework of the University are varied. Besides the training of undergraduate and graduate majors in the field of Mathematics, the Department offers courses designed to meet the needs of students in business; engineering; physical, social, and biological sciences; and elementary and secondary education.

The student considering mathematics as a career should realize that emphasis in mathematics courses will change as he/she progresses through college and graduate school. The early emphasis on solving problems is later subordinated to the more important tasks of formulating problems in mathematical language and of dealing effectively with mathematical structures and abstract ideas.

It should be stressed that an effective mathematician in any type of employment should be a well-educated person. He/she should have not only the technical background of calculus and differential equations taken by most scientists and engineers, and the more advanced mathematical training required for a major in mathematics, but should also have taken a selection of courses from other disciplines. A student who plans to continue beyond the bachelor’s degree in mathematics should also acquire a reading knowledge of at least one and preferably two of the foreign languages in which much of the current literature in mathematics is written, namely, German, Russian, and French. All students should, of course, acquire fluency in the written and oral expression of ideas in English.

The main fields of opportunity in mathematics today are teaching, mathematical statistics, mathematics in industry, mathematics in government and actuarial mathematics. The Mathematics Department provides a test center for Actuarial Examinations and offers several courses which enable the student to prepare for them.

Students may pursue the B.S. degree with a major in mathematics through the College of Arts and Sciences. Teacher certification 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) sponsored by the Mathematical Association of America.

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 urged to take a full year of Advanced Calculus, Math 431 and 432.

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. Non-Mathematics Requirements:

Three hours of Computer Science and 8-9 hours of writing courses as approved by the Mathematics Department (see http://www.und.edu/dept/math/majinfo.html).

III. The Following Curriculum of 39 Major Hours:

Mathematics Core
Math 165, 166, 265 ... Calculus I, II, III .................................................. (12)
Math 327 ............... Applied Linear Algebra .................................................... (3)
Math 442 ............... Linear Algebra ................................................................. (3)
Math 266 ............... Elementary Differential Equations ............................... (3)

Mathematics Sequences
Two full two-semester sequences from the list below. At least one sequence must include two 400 level courses. .................................................. (12)
Math 208 & 408 ........ Discrete Mathematics & Combinatorics
Math 352 & 412 ......... Introduction to Partial Differential Equations and Differential Equations
Math 409, 435, 471 ..... Any two of these three (for at most one sequence):
Geometry, Number Theory, Complex Variables
Math 421 & 422 ........ Statistical Theory I & II
Math 431 & 432 & 477 .... Advanced Calculus I & II
Math 441 & 442 ...... Abstract Algebra & Linear Algebra
Math 461 & 462 .......... Numerical Analysis I & II

Electives
Math courses numbered 208 and above, excluding 277, 377, 400, 477 ...... (9)

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
a. The General Education, Non-Mathematics, and Mathematics Core requirements as described above.

b. The following sequences:
   Math 441 and 442
   Math 409 and 435

c. Math 208, 308, 321 and 330

II. Admission to the Secondary Program, normally while taking T&L 325. (See College of Education and Human Development for admission and licensing requirements.)

III. The program in Secondary Education, to include:
   T&L 325 .... Exploring Teaching in Secondary Schools ....................... (3)
   T&L 345 .... Curriculum Development and Instruction ....................... (3)
   T&L 350 .... Development and Education of Adolescents ................... (3)
   T&L 386 .... Field Experience (Optional) ............................................ (1)
   T&L 390 .... Special Topic ......................................................................... (1-3)

   Math 400 .... Methods and Materials of Teaching Middle and Secondary School Mathematics .......................... (3)

   T&L 433 .... Multicultural Education .................................................. (3)
   T&L 460 .... Microteaching ................................................................. (2)
   T&L 486 .... Field Experience ............................................................... (1)
   T&L 487 .... A full semester of student teaching, normally taken during the semester of graduation .......... (16)

   T&L 488 .... Senior Seminar ................................................................. (1)

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:
Math 165, 166, 265 .... Calculus I, II, III .................................................... (12)
At least three additional courses numbered 208 and above, not including 277, 377, 397 or 477. Math 405, 415, 416, 494, and 495 may be used only with prior approval from the Mathematics Department.

MINOR IN MATHEMATICS FOR PRIMARY EDUCATION
Required 20 credits of Mathematics, including:
Math 115 ........ Introduction to Mathematical Thought ............................... (3)
Math 277 ....... Math for Elementary School Teachers ............................... (3)
Math 377 ....... Geometry for Elementary Teachers ..................................... (3)
Math 477 ....... Topics in Elementary School Mathematics ........................ (3)

And, at least one of the following:
Math 146 ....... Applied Calculus I ............................................................... (3)
Math 165 ....... Calculus I ................................................................. (4)
Math 166 ....... Calculus II ................................................................. (4)
Math 208 ....... Discrete Mathematics .......................................................... (3)

All electives may be selected from Mathematics courses above Math 102.

MINOR IN STATISTICS (Plan A)
Requires 3 semesters of calculus (Math 165, 166, 265) as prerequisite.
Required: 9 credits, including:
Math 421, 422 .... Statistical Theory I, II ............................................ (6)
Biol 470 .... Biometry ............................................................................. (3)
EFR 513 .... Basic Computer Applications in Education ....................... (2)
EFR 514 .... Small System Computer Applications in Education ............ (3)
EFR 516 .... Statistics II ................................................................. (3)
CEE 515 .... Design of Engineering Experiments ................................. (3)
EE 411 .... Communications Engineering ............................................ (3)
EE 412 .... Applied Statistics ................................................................. (3)
Math 403 .... Theory of Probability ............................................................ (3)
Math 415 .... Topics in Applied Math (when appropriate) ................. (3)
Math 416 .... Topics in Statistics ............................................................... (3)
Math 421 .... Statistical Theory I ............................................................... (3)
Math 515 .... Design of Engineering Experiments ................................. (3)

MINOR IN STATISTICS (Plan B)
Requires Math 146, Applied Calculus, as prerequisite.
Required: 12 credits from:
Biol 470 .... Biometry ............................................................................. (3)
EFR 513 .... Basic Computer Applications in Education ....................... (2)
EFR 514 .... Small System Computer Applications in Education ............ (3)
EFR 516 .... Statistics II ................................................................. (3)
CEE 515 .... Design of Engineering Experiments ................................. (3)

More than 1 class from:
Econ 210 .... Elementary Business and Economics Statistics ............... (3)
Psych 241 .... Introduction to Statistics ................................................... (4)
Soc 326 .... Sociological Statistics ........................................................... (3)
Econ 410 .... Empirical Methods in Economics I .................................... (3)
EE 411 .... Communications Engineering ............................................ (3)
Math 321 .... Applied Statistics ............................................................... (3)
Math 403 .... Theory of Probability ............................................................ (3)
Math 415 .... Topics in Applied Math (when appropriate) ................. (3)
Math 416 .... Topics in Statistics ............................................................... (3)
Math 421 .... Statistical Theory I ............................................................... (3)
Math 422 .... Statistical Theory II ............................................................. (3)
Psych 541 .... Advanced Univariate Statistics ........................................ (3)
Psych 542 .... Test Construction and Multivariate Analysis ................. (3)
Psych 543 .... Experimental Design ........................................................ (3)
Soc 521 .... Advanced Analytical Methods ............................................ (3)

Courses

NOTE: PTP* indicates an appropriate score in the Placement Testing Program (PTP) is required.

102. Intermediate Algebra. 3 credits. (Does not count toward graduation at UND.) Prerequisite: PTP* Equations, exponents, quadratic equations, lines, graphs, inequalities. S/U grading only. F,SS

103. College Algebra. 3 credits. Prerequisite: PTP* or Math 102. Sections meeting 5 days per week are offered for students determined eligible by the Math Department. Polynomial and rational functions, inverse functions, exponential and logarithmic functions, simple conics, systems of equations, determinants, arithmetic and geometric sequences, the Binomial Theorem. F,SS

105. Trigonometry. 2 credits. Prerequisite: One year of high school geometry and either PTP* or Math 102. Angles, trigonometric functions and their inverses, solving triangles, trigonometric identities. S

107. Precalculus. 4 credits. Prerequisite: Math 102 or PTP*. Equations and inequalities; polynomial rational, exponential, logarithmic and trigonometric functions; inverse trigonometric functions; algebraic and trigonometric methods commonly used in calculus. F,SS

112. Transition to Calculus. 1 credit. Prerequisites: Math 107, Math 146, or PTP*. 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. F, S

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 or On demand

146. Applied Calculus I. 3 credits. Prerequisite: PTP* or Math 103. A non-rigorous introduction to differential and integral calculus. Topics include limits, continuity, differentiation and integration techniques, and applications. F,SS

165. Calculus I. 4 credits. Prerequisites: PTP* or Math 112 or completion of Math 107 with a grade of C or better. Limits, continuity, differentiation, Mean Value Theorem, integration, Fundamental Theorem of Calculus. F,SS

166. Calculus II. 4 credits. Prerequisite: Completion of Math 165 with a grade of C or better or permission of the Mathematics Department. Techniques and applications of integration, exponential and logarithmic functions, parametric equations, infinite sequences and series. F,SS
208. Discrete Mathematics. 3 credits. Prerequisite: FTP5 or Math 103 or Math 107. 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. F, SS

265. Calculus III. 4 credits. Prerequisite: Math 166. Multivariate and vector calculus, including partial derivatives, multiple integration, line and surface integrals, Green’s Theorem, Stokes’ Theorem, the Divergence Theorem. F, SS

266. Elementary Differential Equations. 3 credits. Prerequisite: Math 265 and proficiency in a programming language. Solution of elementary differential equations by elementary techniques. Laplace transforms, introduction to matrix theory and systems of differential equations. F, SS

277. Math for Elementary School Teachers. 3 credits. Prerequisite: Admission to Teacher Education and either FTP5 or Math 103. For elementary education majors only. Topics include number systems used in elementary schools. Includes some methods and work with laboratory materials. F, SS

308. History of Mathematics. 3 credits. Prerequisites: Math 166 or equivalent, or consent of instructor. This course is on the conceptual and chronological history of mathematics. The course involves the interpretation and analysis of how and why mathematical ideas have developed over time, including 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 mathematic, twentieth century mathematics. S

315. Topics in Computational Mathematics. 1-3 credits. Prerequisites: Math 266 and proficiency in a programming language. Consent of instructor. 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. On demand.

321. Applied Statistical Methods. 3 credits. Prerequisite: Math 166. 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. F, SS

327. Applied Linear Algebra. 3 credits. Prerequisite: Math 166. A practical treatment of systems of linear equations, finite dimensional vector spaces, linear transformations, determinants, matrices, eigenvalues, and eigenvectors. F, SS

352. Introduction to Partial Differential Equations. 3 credits. Prerequisite: Math 266. Partial differential equations, Fourier series, special functions, series solutions to ordinary differential equations. S

377. Geometry for Elementary Teachers. 1-3 credits. For elementary education majors only. Experimental and inductive discovery in building geometric concepts at the elementary school level. On demand.

390. Cooperative Education. Prerequisites: 15 completed credits in Math including Math 165, 166, 265, in addition to standard Co-op requirements. A practical work experience with an employer closely associated with the student’s academic area. 1-8 credits per semester. S, SS. Arranged by mutual agreement among student, department, and employer. A maximum of 6 cooperative education credits may be applied against requirements for a Math major. S/U grading only. F, SS


403. Theory of Probability. 3 credits. Prerequisite: Math 265. Sets, sample spaces, discrete probability, distribution functions, density functions, characteristic functions, study of normal, Poisson, binomial and other distributions with applications. S, SS

405. Selected Topics in Mathematics. 1-3 credits. Prerequisite: permission of the Mathematics Department. May be repeated to a maximum of six credits. On Demand.

408. Combinatorics. 3 credits. Prerequisites: Math 208 and 166. Introduction to the techniques and reasoning needed in combinatorial problem-solving. The course may include topics related to combinatorics, such as graph theory. S

409. Geometry. 3 credits. Prerequisite: Math 208 or 330. 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. F


415. Topics in Applied Mathematics. 1-3 credits. Prerequisite: Math 265 and consent of instructor. 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 numerical analysis on 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. On demand.

416. Topics in Statistics. 1-3 credits. Prerequisites: Math 265 and 211 or consent of instructor. 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 illustration. May be repeated for credit with consent of instructor up to six credits. On demand.

421, 422. Statistical Theory I and II. 3 credits each. Prerequisite: For 421: Math 265, for 422: Math 241. 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 action and “F” tests, one and two-way ANOVA, nonparametric methods. F, SS

425. Cryptological Mathematics. 3 credits. Prerequisite: Math 208. This course develops the math behind elementary symmetric-key ciphers and a variety of public-key schemes. Modern block ciphers may be discussed. F, SS

431, 432. Advanced Calculus I and II. 3 credits each. Prerequisite: for 431: Math 330 or consent of instructor; For 432: Math 431. Real number system, functions, sequences, limits, continuity, differentiation, integration, partial differentiation, infinite series, power series and vector analysis. F, SS

435. Theory of Numbers. 3 credits. Prerequisite: Math 208 or 330. Basic properties of numbers, including divisibility, primes, congruences, Diophantine equations and residue theory. S, SS

441. Abstract Algebra. 3 credits. Prerequisite: Math 330 or consent of instructor. Rings, integral domains, fields, elements of group theory. F

442. Linear Algebra. 3 credits. Prerequisite: Math 265 and 330 or consent of instructor. A theoretical treatment of systems of linear equations, matrices, vector spaces, linear transformations and elementary canonical forms. S

450. Elements of Topology. 3 credits. Prerequisite: Math 330 or consent of instructor. Set operations, mappings, functions, continuity, compactness, connectedness and topological spaces with special emphasis on topologies of the real line. On demand.

460. Mathematical Modeling. 3 credits. Prerequisite: Math 266 and either 327 or 442, or consent of instructor. The primary goal of this 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. F, SS

461, 462. Numerical Analysis I and II. 3 credits each. Prerequisite: Math 266 and a scientific programming language. Prerequisite for 462 is Math 461 or consent of instructor. Numerical techniques for: the solution of equations in one or several unknowns, approximation, integration, differential equations, approximation theory, optimization theory and matrix analysis. Corresponding error analysis will be investigated. F, SS

465. Topics in Operations Research. 3 credits. Prerequisites: Math 265 and either 327 or 442, or consent of instructor. The primary goal of this course is to present the mathematical methods useful in the analysis of problems that involve making decisions. Topics may include optimization, mathematical programming, network analysis, decision theory, game theory, queueing theory, and dynamic programming. S, SS

471. Introduction to Complex Variables. 3 credits. Prerequisite: Math 265. The complex plane, analytic functions, complex integration, power series, the theory of residues and contour integration, conformal mapping, Fourier and Laplace transformations, and applications. F, SS

474. Introduction to Elementary School Mathematics. 1-3 credits. May be repeated for credit up to six credits. For elementary education majors only. Selected topics from Mathematical concepts appropriate to the elementary school curriculum. On Demand.

479. Topics in Mathematics Education. 1-3 credits. Prerequisite: Consent of instructor. May be repeated for credit up to six credits. Selected topics from mathematical concepts appropriate for K-12 educators on demand.

494, 495. Reading Course in Mathematics. 1-3 credits, repeatable to six credits. Consent of instructor required. Directed individual reading on topics not developed in other courses. F, SS

Mechanical Engineering (ME)

Ames, Bandyopadhyay, Bibel, Cavalli, Grewal, Johnson, Kulkarni (Chair), Semke, Stanlake and Zahui

The primary mission of the Mechanical Engineering Department is to prepare graduates to function effectively as mechanical engineers in a wide spectrum of industries. The Department’s further mission is to engage in research and scholarly activity that contributes to basic and applied discovery to enhance student learning while being of benefit to the state, region, and nation. Educational objectives contributing to the overall mission are:

1. Develop students’ critical thinking and problem solving skills using the principles of science and mathematics.
2. Give students a broad understanding of mechanical engineering including the areas of: a) thermal sciences, b) mechanical design, and c) manufacturing processes & materials.
3. Give students design experiences that blend scientific knowledge, engineering analysis, and societal and humanitarian issues.

4. Equip graduates with the engineering knowledge and technical, leadership, and communication skills to qualify for entry level professional positions.

5. Provide opportunities for students to prepare for graduate school.

Continuous assessment of student learning in accordance with specific program outcomes, including input from program constituents such as students, alumni, employers and industry advisory groups, provides opportunity to measure success in meeting the mission of the department. Beginning with the freshman year, teamwork, problem solving, and design exercises are interwoven throughout the curriculum, culminating in a two-semester capstone design project during the senior year. Several courses include laboratories which develop experimental, teamwork, and communication skills. Technical papers required by selected courses develop knowledge of contemporary issues as well as communication skills. State-of-the-art computer software is used extensively throughout the curriculum. Within our bachelor’s degree we offer an option known as the “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 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 mechanical engineering or a related field.

The department offers combined Bachelor of Science in Mechanical Engineering (BSME)/Master of Science (with a major in Mechanical Engineering) and BSME/Master of Engineering degrees. For more detailed information, see Mechanical Engineering in the Graduate Section and Combined Degree Program under the School of Engineering and Mines section.

The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

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 ME 418, ME 483, ME 487 and ME 488 Engineering Design sequence.

School of Engineering and Mines

B.S. IN MECHANICAL ENGINEERING

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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Second Semester</th>
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</thead>
<tbody>
<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 Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>Engl 110</td>
<td>College Composition I</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 120</td>
<td>College Composition II</td>
<td>(3)</td>
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<tr>
<td>Engl 125</td>
<td>Technical and Business Writing</td>
<td>(3)</td>
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<tr>
<td>ME 101</td>
<td>Intro. to Mechanical Engineering</td>
<td>(3)</td>
</tr>
<tr>
<td>Engr 200</td>
<td>Computer Applications in Engineering</td>
<td>(2)</td>
</tr>
<tr>
<td>Math 165, 166</td>
<td>Calculus I, II</td>
<td>(4)</td>
</tr>
<tr>
<td>Phys 251</td>
<td>University Physics I</td>
<td>(4)</td>
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<tr>
<td>Phys 251L</td>
<td>University Physics I Lab</td>
<td>(0)</td>
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<tr>
<td>Arts and Humanities</td>
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<tr>
<th>Sophomore Year</th>
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<tbody>
<tr>
<td>Engr 201</td>
<td>Statics</td>
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<td>Engr 202</td>
<td>Dynamics</td>
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<tr>
<td>Engr 203</td>
<td>Mechanics of Materials</td>
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<tr>
<td>ME 201</td>
<td>Student Design</td>
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<tr>
<td>ME 341</td>
<td>Thermodynamics</td>
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<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
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<tr>
<td>EE 206</td>
<td>Circuit Analysis</td>
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<tr>
<td>Math 265</td>
<td>Calculus III</td>
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<tr>
<td>Math 266</td>
<td>Elementary Differential Equations</td>
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<tr>
<td>Phys 252</td>
<td>University Physics II</td>
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<tr>
<td>Phys 252L</td>
<td>University Physics II Lab</td>
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<tr>
<td>Phys 253</td>
<td>University Physics III</td>
</tr>
<tr>
<td>Phys 253L</td>
<td>University Physics III Lab</td>
</tr>
<tr>
<td>or Chem 122</td>
<td>General Chemistry II</td>
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<tr>
<td>Chem 122L</td>
<td>General Chemistry II Lab</td>
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<tr>
<th>Junior Year</th>
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<tbody>
<tr>
<td>ME 301</td>
<td>Materials Science</td>
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<tr>
<td>ME 306</td>
<td>Fluid Mechanics</td>
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<tr>
<td>ME 322</td>
<td>Kinematics and Dynamics of Machines</td>
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<td>ME 323</td>
<td>Machine Component Design</td>
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<tr>
<td>ME 323L</td>
<td>Machine Component Design Lab</td>
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<tr>
<td>Engr 460</td>
<td>Engineering Economy</td>
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<tr>
<td>ME 474</td>
<td>Fund Heat &amp; Mass Transfer</td>
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<tr>
<td>Math 321</td>
<td>Applied Statistical Methods</td>
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<tr>
<td>Technical Elective</td>
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<tr>
<th>Senior Year</th>
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<tbody>
<tr>
<td>ME 418</td>
<td>Manufacturing Processes</td>
</tr>
<tr>
<td>ME 480</td>
<td>Mechanical Engineering Seminar</td>
</tr>
<tr>
<td>ME 483</td>
<td>Mechanical Measurements Lab</td>
</tr>
<tr>
<td>ME 487</td>
<td>Engineering Design</td>
</tr>
<tr>
<td>ME 498</td>
<td>Engineering Design</td>
</tr>
<tr>
<td>ME 370</td>
<td>Engineering Disasters and Ethics</td>
</tr>
<tr>
<td>or ChE 340</td>
<td>The Role of Engineers &amp; Applied Scientists in a Global Society</td>
</tr>
<tr>
<td>or Phil 370</td>
<td>Ethics in Engineering &amp; Science (A&amp;H)</td>
</tr>
<tr>
<td>or Social Science</td>
<td>(if taking ME 370 or ChE 340)</td>
</tr>
<tr>
<td>Technical Electives</td>
<td>(6)</td>
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</tbody>
</table>

TECHNICAL ELECTIVES:

Technical electives must be chosen from the following three groups as stated unless the student is seeking the Aerospace concentration. For the Aerospace concentration, technical electives must be chosen from the Aerospace group of electives as identified by a # in the technical elective listing below. One of the technical electives has to be either ME 429 or ME 464.

ME 490 or ME 590 may also be included in the respective groups at the discretion of the Mechanical Engineering Chair. Further, students who satisfactorily complete two Cooperative Education (ME 397) experiences for a combined total of at least 3 credit hours are granted a waiver for one technical elective. The waived technical elective is considered as elective at large and is NOT specified into any one of the three groups listed below.

Mechanical Design:

(Take at least one from this group or any three for optional emphasis)

ME 342#        | Systems, Dynamics and Controls | (3) |
ME 426#        | Mechanical Vibrations | (3) |
ME 429#        | Intro. to Finite Element Analysis | (3) |
ME 523#        | Advanced Machine Design | (3) |
ME 526#        | Advanced Vibrations | (3) |
ME 529#        | Advanced Finite Element Methods | (3) |
ME 532#        | Advanced Dynamics | (3) |

Thermal Systems:

(Take at least one from this group or any three for optional emphasis)

ME 342#        | Intermediate Thermodynamics | (3) |
ME 446#        | Gas Turbines | (3) |
ME 449#        | Internal Combustion Engines | (3) |
ME 451#        | Heating and Air Conditioning | (3) |
ME 464#        | Computational Fluid Dynamics | (3) |
ME 476#        | Intermediate Fluid Mechanics | (3) |
ME 477#        | Compressible Fluid Flow | (3) |
ME 545#        | Fluidized-Bed Combustion | (3) |
ME 574#        | Advanced Heat Transfer | (3) |

Manufacturing and Materials:

(Take at least one from this group or any three for optional emphasis)

ME 313#        | Material Properties and Selection | (3) |
ME 428#        | Advanced Manufacturing Processes | (3) |
ME 514#        | Processing of Advanced Materials | (3) |
Aerospace Concentration: Requires 133 hours

1. Completion of Avit 102, Introduction to Aviation, 5 credits. This course includes earning a private pilot license and is recommended for the summer session between the freshman and sophomore years.**

2. Technical electives must be chosen from the aerospace group of electives as identified by a # in the above technical elective listing. One of the technical electives has to be either ME 429 or ME 464. An ME 490 or an ME 590 may also be included in the aerospace group at the discretion of the Mechanical Engineering Chair.

** Students already holding a private pilot license may earn a commercial license or an acceptable advanced rating through UND as a substitute for Avit 102.

Courses

101. Introduction to Mechanical Engineering. 3 credits. Development of visualization, technical communication, and documentation skills. 3-D geometric modeling as applied to CAD applications using current methods and techniques commonly found in industry. Introduction to engineering design and analysis of a machine or system, and team problem solving. Development of an academic career plan. F

201. Student Design. 1 credit. Prerequisite: ME 101. Corequisites: PHYS 251 or ENGR 201. 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. F

290. Special Laboratory Problems. 1 to 3 credits. Repeatable to a maximum of 6 credits. Consent of instructor. Laboratory investigations of interest to student and faculty. On demand.

301. Materials Science. 3 credits. Prerequisites: Chem 121, Phys 252. The theory of the structure of matter, the prediction and evaluation of engineering properties of materials. F

306. Fluid Mechanics. 3 credits. Prerequisites: Phys 251, Math 265. 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. F

313. Material Properties and Selection. 3 credits. Prerequisite: ME 301. Study of relationships between materials, manufacture and design of engineering component. On demand.

322. Kinematics and Dynamics of Machines. 3 credits. Prerequisite: Engr 200, 202 and ME 310. Analytical and graphic study of motions, velocities, accelerations and forces for design of machine elements such as links,cams and gears. F

323. Machine Component Design. 3 credits. Prerequisite: Engr 203, ME 322. 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. S

323L. Machine Component Design Laboratory. 1 credit. Corequisite: ME 323. 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. S

324. Systems Dynamics and Control. 3 credits. Prerequisites: Math 266, ME 322. Theory, analysis, and design of linear closed-loop control systems containing electronic, hydraulic, and mechanical components. Differential equations. Lapple transforms, Nyquist and Bode diagrams are covered. On demand.

341. Thermodynamics. 3 credits. Prerequisites: Phys 251, Math 166. Fundamental energy relationships applied to both closed and open systems. Determination of thermodynamic properties, first and second laws of thermodynamic processes and basic cycles. F/S


370. Engineering Disasters and Ethics. 3 credits. Prerequisite: Junior or Senior standing. 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.

397. Cooperative Education. 1-3 credits repeatable to 12. Prerequisite: Eligible for admission to the mechanical engineering degree program. A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department and employer. F/S,SS

418. Manufacturing Processes. 4 credits. Prerequisite: Engr 203, ME 301. Descriptive and analytical study of manufacturing methods and economics as they pertain to machining, metrology and automation. Includes laboratory. F

426. Mechanical Vibrations. 3 credits. Prerequisite: Engr 202, Math 266. 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. S

428. Advanced Manufacturing Processes. 3 credits. Prerequisite: ME 418. Individual projects involving the manufacturing economics and flow charts for selected products and basic technical principles of manufacturing processes. Includes laboratory. On demand.

429. Introduction to Finite Element Analysis. 3 credits. Prerequisite: Engr 203. Finite element analysis is introduced as a design tool. Emphasis is given to modeling techniques and element types. Matrix and energy methods are also introduced. On demand.


451. Heating and Air Conditioning. 3 credits. Prerequisite: ME 442 or consent of the instructor. Corequisite: ME 474. Psychrometrics, heating and cooling loads and analysis of air conditioning systems. On demand.

464. Computational Fluid Dynamics. 3 credits. Prerequisites: ME 306 and Math 266. 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. On demand.

474. Fundamentals of Heat & Mass Transfer. 3 credits. Prerequisites: Math 266, ME 306 and 341. Convection, conduction, radiation, dimensional analysis and design of heat transfer equipment. S


480. Mechanical Engineering Seminar. 3 credits. Prerequisite: Senior standing. Reports and presentations on current developments in mechanical engineering and engineering ethics. F

483. Mechanical Measurements Laboratory. 3 credits. Prerequisite: EE 206. Experiments and written reports on the operation and performance of instruments and basic mechanical engineering equipment. F

487. Engineering Design. 2 credits. Prerequisites: ME 323, ME 323L, and either ME 474 or one elective from the thermals sciences group. Corequisites: Engr 460 and 483. The first course of a two-course sequence in Engineering Design, establish concepts and important features of the machine or system, do market analysis, establish design objectives, explore alternatives, conduct research, specify constraints. F

488. Engineering Design. 3 credits. Prerequisites: ME 487. 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. S

489. Senior Honors Thesis. 1 to 8 credits; total not to exceed 9. Prerequisite: consent of the Department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F/S

490. Special Laboratory Problems. 1 to 3 credits. Repeatable to maximum of 6 credits. Prerequisite: Consent of instructor. Laboratory investigations of interest to students and faculty. On demand.

Medicine (Med)

100. Introduction to Health Sciences Professions. 1 credit. Introduction to the roles, ethics, certification, education, employment and fundamental knowledge and skills related to the health science professions. F, S, SS

205. Medical Terminology. 1 credit. Knowledge of medical terminology learned through the study of different body systems. F, S, SS
Microbiology and Immunology (MBio)

Bradley, Flower, Hill, Melvold (Chair), Nilles, Sailer and Young

Courses

202. Introductory Medical Microbiology Lecture. 3 credits. Prerequisite: Chem 121 or 116. Three hours lecture per week. 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. F

202L. Introductory Medical Microbiology Laboratory. 2 credits. Prerequisite: Chem 121 or 116. Corequisite: MBio 202. Four hours laboratory per week. An introductory laboratory course in the isolation and identification of all types of microorganisms with an emphasis on those that cause disease. F

302. General Microbiology Lecture. 2 credits. Prerequisites: BioL 150 or Chem 116 or Chem 121 or permission of instructor. Two hours lecture per week. 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. S

302L. General Microbiology Laboratory. 2 credits. Prerequisite or corequisite: MBio 302. Four hours laboratory per week. The growth, isolation, and identification of microorganisms from a variety of sources using procedures such as staining, microscopy, pure culturing, and biochemical tests. S

320. Introduction to Immunology. 3 credits. Prerequisites: BioL 150, 151, or BMB 301 or equivalent. An introduction to the fundamentals of immunology including immunocommunity, humoral and cellular response, hypersensitivity, immunodeficiency, immunogenetics, tolerance and immunodiagnosis. F

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. F,S,SS

Military Science (MSci)

Beckman, Punton, Sickinger (Chair), Tolan and Waddell

The Army Reserve Officer Training Corps (ROTC) offers a program of instruction designed to mold young 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 as reserve officers may request active duty or may serve with the Army Reserve or National Guard after a short period of active duty

Courses

101. Military Science I. 2 credits. Make your first new peer group at college one committed to performing well and enjoying the experience. Increase self-confidence through team study and activities in basic drill, physical fitness, rappelling, leadership reaction course, and basic marksmanship. Learn fundamental concepts of leadership in both a classroom and outdoor laboratory environment. Participation in a weekend exercise is optional. F

101L. Leadership Lab. 1 credit. Corequisite: MSci 101. An introduction to individual and team aspects of military tactics in small unit operations. Includes basic drill and ceremony, marksmanship training and fundamental concepts of leadership. F

102. Military Science II. 2 credits. Learn/apply ethics-based leadership skills that develop individual abilities and contribute to the building of effective teams of people. Develop skills in oral presentations, writing concisely, planning of events, coordination of group efforts, land navigation and basic military tactics. Learn fundamentals of ROTC’s Leadership Assessment Program. F

102L. Leadership Lab. 1 credit. Corequisite: MSci 102. An introduction to individual and team aspects of military tactics in small unit operations. Includes operation order writing, team level movement techniques, and followship. S

104. Military Science II. 2 credits. Learn/apply ethics-based leadership skills that develop individual abilities and contribute to the building of effective teams of people. Develop skills in oral presentations, writing concisely, planning of events, coordination of group efforts, land navigation and basic military tactics. Learn fundamentals of ROTC’s Leadership Assessment Program. F

201L. Leadership Lab. 1 credit. Corequisites: MSci 201, 241. Learn and apply the principles of effective leadership. Reinforce self-confidence. Includes drill and ceremony, weapon qualification and leadership principles. F

Training Program. This gives financial assistance for all helicopter training. 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, computer lab, and a rifle range 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MSCI 301</td>
<td>Military Science III</td>
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<td>MSCI 301 LAB</td>
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<tr>
<td>MSCI 302</td>
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<tr>
<td>MSCI 402 LAB</td>
<td>Military Science Lab</td>
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<tr>
<td>MSCI 441</td>
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<tr>
<td>MSCI 442</td>
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<td>Hist 210</td>
<td>Military History</td>
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3 credits from the following:

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<tr>
<td>Pols 220</td>
<td>International Politics</td>
<td>3</td>
</tr>
<tr>
<td>Pols 223</td>
<td>Comparative Politics</td>
<td>3</td>
</tr>
<tr>
<td>Hist 269</td>
<td>World War II</td>
<td>3</td>
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<tr>
<td>Hist 335</td>
<td>Nuclear Weapons and the Modern Age</td>
<td>3</td>
</tr>
<tr>
<td>Hist 339</td>
<td>The United States and Vietnam, 1945-1975</td>
<td>3</td>
</tr>
<tr>
<td>Hist 412</td>
<td>U.S. Foreign Relations Since 1900</td>
<td>3</td>
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3 hours from the following:

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<td>Interpersonal Communication</td>
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<tr>
<td>Mgmt 300</td>
<td>Principles of Management (Restricted to BPA Majors)</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 305</td>
<td>Managerial Concepts (Restricted to non-BPA Majors)</td>
<td>3</td>
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<tr>
<td>Nurs 478</td>
<td>Leadership and Management (Restricted to Nursing Majors)</td>
<td>3</td>
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<tr>
<td>Phil 370</td>
<td>Ethics in Science and Engineering (Restricted to junior/senior standing)</td>
<td>3</td>
</tr>
<tr>
<td>Phil 373</td>
<td>Ethics in Business and Public Relations</td>
<td>3</td>
</tr>
<tr>
<td>Info 217</td>
<td>Fundamentals of Management Information Systems</td>
<td>4</td>
</tr>
</tbody>
</table>
202. Military Science II. 2 credits. Introduction to individual and team aspects of military tactics in small unit operations. Includes use of radio communications, making safety assessments, movement techniques, planning for team safety/security and methods of pre-execution checks. Practical exercises with upper division ROTC students. Learn techniques for training others as an aspect of continued leadership development.

201L. Leadership Lab. 1 credit. Corequisites: MSci 202, 242. Learn and apply the principles of effective leadership. Reinforce self-confidence. Includes small unit tactics, land navigation and FLRC (Field Leadership Reaction Course). S

215. Conflict Simulation. 1 credit. A course providing military strategy and tactics through the use of war gaming activities based upon historical renderings. F,S

241. Military Physical Conditioning. 1 credit. Corequisites: MSci 201, 201L. Building on concepts of the 100 level class, emphasizing on the Army components of physical fitness, including cardiorespiratory endurance, muscular strength and 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. F

242. Military Physical Conditioning. 1 credit. Corequisites: MSci 202, 202L. Continuation of 201 with emphasis on leadership of a squadron 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, sit-ups, and a timed two-mile run. S

290. ROTC Basic Course. 4 credits. A course designed to qualify students for advancement into the advanced phases of ROTC. This class can also be used by military veterans to receive credit for completion of basic training and advanced occupational skill training after meeting certain course requirements.

301. Military Science III. 3 credits. Prerequisite: ROTC Basic Course or advanced placement credit. 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. Three hours and a required leadership lab, MSci 301L, plus required participation in three one-hour sessions for physical fitness. Participation in one weekend exercise is also required, and one or two more weekend exercises may be offered for optional participation. F

301L. Leadership Lab. 1 credit. Corequisites: MSci 301 and 341. 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. F

302. Military Science III. 3 credits. Prerequisite: same as MSci 301. Continues methodology of MSci 301. Analyze tests; 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. Three hours and a required leadership lab, MSci 302L, plus required participation in three one-hour sessions for physical fitness. Participation in one weekend exercise is required; two other weekend exercises are optional. S

302L. Leadership Lab. 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. Preparation for Army ROTC Leader Development and Assessment Course (LDAC) at Ft. Lewis, Washington in the summer. S

341. Military Phy Conditioning. 1 credit. Corequisites: MSci 301 and 301L. 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. F

342. Military Phy Conditioning. 1 credit. Corequisites: MSci 302, 302L. 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. Additionally, emphasis is placed on preparation for the very physical aspects of attendance at the US Army ROTC Leader Development and Assessment Course (LDAC) during the summer. S

401. Military Science IV. 3 credits. Prerequisite: MSci 301, 302. Corequisites: MSci 401L, 441. Instruction in organization and function of a military staff, training management, communication skills, counseling, problem solving, and leader development. Course includes leadership laboratories and field exercises. F

401L. Leadership Lab. 1 credit. Corequisites: MSci 401, 441. 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. F

402. Military Science IV. 3 credits. Prerequisite: MSci 301, 302. Corequisites: MSci 402L, 442. Instruction in leadership skills and development, foundations of military law and ethics, personnel and management-issues, and morals. Course includes leadership laboratories and field exercises. S

402L. Leadership Lab. 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. S

441. Military Physical Conditioning. 1 credit. Corequisites: MSci 401, 401L. A course providing military strategy and tactics through the use of war gaming activities based upon historical renderings. F,S

Music

Music (Musc)

Blackburn (Chair), Blake, Bronfman, Christopherson, Costs, Gallo, Ingle, Keyser, Lewis, Norman-Dearden, Popejoy, Rheude, Towne and Wittgraf

Music is offered at the University of North Dakota in the belief that it contributes to the aesthetic development of humankind. The UND Music Department seeks to provide a multi-faceted environment of excellence in which students and faculty realize their full potential as musicians and scholars. As a learning community, we value mutual respect and cooperation and we acknowledge local roots and a global perspective. An accredited institutional member of the National Association of Schools of Music, the Department of Music through its curricula and performance opportunities serves a broad constituency of students in their preparatory, life-long, pre-professional, and inservice learning endeavors.

Music courses that are specifically designed for general education include: Music 100, 101, 203, and Fine Arts 150. These courses, along with performing ensembles, can fulfill the Arts and Humanities portion of the University’s General Education Requirements. Individual lessons for credit are offered to music majors and minors, although talented non-majors may audit for lessons (Music 153) and are accepted in proportion to faculty loads.

Prior to admission to any of the music degree programs, students’ musical background and skills will be evaluated, and a meeting with the appropriate faculty member(s) will be scheduled. Prospective students are also encouraged to contribute any other materials (compositions, papers, recordings, etc.) for consideration. The purpose of this advisory process is to ensure that students are capable of college-level music study, and to select the degree program most appropriate to their goals and abilities.

The study of music at the University begins with a series of core courses common to all music major degree programs, along with individual lessons in the appropriate area and ensemble participation. Students must complete an audition in their major performing medium prior to acceptance for individual lessons. First-year students in a music major or minor should register initially for Music 130 and 131, as well as for individual lessons and the major ensemble within their area of concentration. In addition, music majors should also register for Music 133. Placement tests administered during the first week of classes will evaluate the student’s readiness for Music Theory. Deficiencies revealed by the examination may require remedial study in Music 101 prior to beginning Music 130 and 131. Upper-division courses are pursued in accordance with the specific degree program selected by the student.

Each music major degree program has a specific piano proficiency requirement, which all music majors must fulfill. Students in
the Bachelor of Music degrees in Performance, Music Education, or Music Therapy must pass all levels of Piano Proficiency (Musc 133, 136, 233, 236 or equivalent). Bachelor of Arts students must pass Piano Proficiency Level I (Musc 133). These requirements must be met prior to graduation, or prior to registration for either Student Teaching or Music Therapy Internship.

Ensemble participation is a component of each of the degree programs offered within the department. Normally, students in the Bachelor of Music program participate in an ensemble each semester of residence except for the semester of student teaching. For Music Education students this should be the large ensemble of their major instrumental or vocal area. The number of ensemble credits for each degree is listed below. More information about the ensemble requirement for each degree program can be found in the Department of Music Undergraduate Handbook available in the department office.

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, 255, 355, 455) 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.

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, and teaching abilities needed to function as a professional music educator. The student will select either an instrumental or vocal/choral emphasis, culminating in the presentation of a half recital. The successful completion of this program will qualify the student for state licensure in instrumental, choral, and general music, grades K-12.

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 Bards, Wind Ensemble, University Band, or University Chamber Orchestra.

The Music Therapy major is a competency-based program, which includes both academic and clinical work, culminating in an American Music Therapy Association approved internship. Academic requirements include courses in Music, Music Therapy and related fields. Clinical requirements include four levels of practica in a variety of community settings under the guidance of a music therapist in cooperation with community clinicians. The program is designed to produce highly skilled and broadly based music therapists who will meet the requirements for accreditation by the American Music Therapy Association.

The Bachelor of Arts degree program in music is designed for the student who wishes a general liberal arts education with emphasis in music. Along with a broad coverage of the discipline, the student selects an area of concentration, e.g., music history, music theory, music technology, composition, culminating in a final project.

In addition to examinations in traditional classroom courses, student progress in Individual Lessons is evaluated every semester through Individual Music jury examinations. At the end of the fourth semester of Individual Lessons study or at the end of the fourth semester of Music Theory, whichever comes first, all Music majors will undergo a Sophomore Review which includes a review of all academic work completed to that point and a jury performance examination in their major instrument. Students majoring in music must make a grade of “C” or better in every music course taken toward the degree and pass the jury performance examination in order to enroll in 300 level Individual Lessons. In sequential music courses, students must make a grade of “C” or better to progress to the next course in the sequence. Music Education students must complete a portfolio review as required by the Department of Teaching and Learning. Music Therapy students must be enrolled in Individual Instruction every semester they are enrolled in the program, up to a minimum of 8 credits.

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.

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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Proficiency.

Core Courses
Musc 130, 134, 230, 234, .... Harmony and Theory Sequence (12)
Musc 131, 135, 231, 235, .... Aural Skills Sequence (4)
Musc 203, .... Popular and Classical Musics of the World (3)
Musc 310, 311, 312, .... Music History Survey I, II, III (6)
Musc 490, Seminar in Music (3)
Musc 256, Basic Conducting (2)

Performance Courses
Majors Instrument (24)
Secondary Instrument (may include Keyboard Skills Sequence; Musc 133, 136, 233, 236) (4)
Musc 444, Applied Music Pedagogy (2)
Musc 359, Junior Recital (1)
Musc 459, Senior Recital (1-2)
Musc 256, Basic Conducting (2)
Musc 133, 136, 233, 236, Keyboard Skills Sequence (4)

VOCAL MAJORS

Performance Courses
Musc 242, Diction for Singers (2)
Musc 269, Opera Workshop (2)
Ensembles, Large and Small (10)

History, Literature, Theory and Composition
Musc 415, Song Literature (2)
Electives (6)

Foreign Language Requirement
French 101, 102 or German 101, 102 or Italian 101, 102 (8)

Other Electives
Electives in disciplines other than the major (6)

INSTRUMENTAL MAJORS

Performance Courses
Ensembles, Large and Small (12)

Music History, Literature, Theory and Composition
Electives - Keyboard must include Musc 414, Piano Literature (3) (12)

Other Electives
Electives in disciplines other than the major (9)

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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Proficiency.

Core Courses
- Musc 130, 134, 230, 234: Harmony and Theory Sequence ......................... (12)
- Musc 131, 135, 231, 235: Aural Skills Sequence ........................................ (4)
- Musc 203: Popular and Classical Musics of the World ............................ (3)
- Musc 310, 311, 312: Music History Survey I, II, III .................. (6)
- Musc 256: Basic Conducting ................................................................. (2)
- Piano Proficiency through Level III or Musc 133, 136, 233, 236 .............. (4)

INSTRUMENTAL EMPHASIS

This coursework meets the criteria for the Instrumental Licensure in Music Education in North Dakota.

Other studies
- Musc 427: Analysis of Musical Form ..................................................... (2)
- Musc 417: Instrumental Literature ....................................................... (2)

Performance
- Major Instrument ................................................................. (7)
- Major Instrumental Ensemble .......................................................... (7)
- Piano as a secondary instrument (may include Keyboard Skills Sequence: Musc 133, 136, 233, 236) .................................................. (4)
- Musc 357, 358: Choral, Instrumental Conducting .................................. (4)
- Musc 459: Senior Recital ................................................................. (1-2)

Music Education
- Musc 140: Methods: Woodwinds, Brass, Strings, Percussion ................. (5)

Music Technology
- Musc 340: Introduction to Music Technology (Credits apply toward T&L 390) (2)

OPTIONAL CHORAL LICENSURE TRACK (9 hours)

This additional coursework meets the criteria for Choral Licensure in Music Education in North Dakota.

Vocal/Choral Option:
- Musc 445: Choral Methods ................................................................ (3)
- Musc 416: Choral Literature ................................................................. (2)
- Musc 260, 263 or 264: Large Choral Ensemble ........................................ (1)
- Musc 357: Choral Conducting .............................................................. (2)*
- Musc 440: Methods: Voice ................................................................. (1)*

*Included in Instrumental Emphasis

VOCAL/CHORAL EMPHASIS

This coursework meets the criteria for the Choral Licensure in Music Education in North Dakota.

Other studies
- Musc 423: Instrumental and Choral Arranging ..................................... (2)
- Musc 427: Analysis of Musical Form ..................................................... (2)
- Musc 416: Choral Literature ................................................................. (2)

Performance
- Major Instrument or Voice .............................................................. (7)
- Major Choral Ensemble ...................................................................... (7)
- Voice or Piano as a secondary instrument (may include Keyboard Skills Sequence: Musc 133, 136, 233, 236) .................................................. (4)
- Musc 357, 358: Choral, Instrumental Conducting .................................. (4)
- Musc 459: Senior Recital ................................................................. (1)

Music Education
- Musc 140: Methods: Woodwinds, Brass, Strings, Percussion ................. (2)
- Musc 150: Class Lessons (Guitar) ....................................................... (1)
- Musc 180: Introduction to Music Therapy ............................................. (3)
- Musc 242: Diction for Singers ............................................................. (1)
- Musc 440: Methods and Materials for Elementary Music ................... (3)
- Musc 441: Methods and Materials for Secondary Music .................... (3)
- Musc 445: Applied Music Pedagogy (Voice) ......................................... (2)
- Musc 445: Choral Methods ................................................................. (3)

Music Technology
- Musc 340: Introduction to Music Technology (Credits apply toward T&L 390) (2)

PROFESSIONAL EDUCATION

T&L 252, 325, 386, 433, 486, 487, 488 (See adviser for clarification.)

OPTIONAL INSTRUMENTAL LICENSURE TRACK (9 hours)

This additional coursework meets the criteria for Instrumental Licensure in Music Education in North Dakota.

Instrumental Option:
- Musc 446: Instrumental Methods ........................................................ (3)
- Musc 417: Instrumental Literature ....................................................... (2)
- Musc 270, 271: Guitar Proficiency ........................................................ (2)
- Musc 357: Large Instrumental Ensemble ............................................ (1)
- Musc 140: Methods (in addition to 2 hours already required) ............... (1)*
- *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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Proficiency.

Core Courses
- Musc 130, 134, 230, 234: Harmony and Theory Sequence .................. (12)
- Musc 131, 135, 231, 235: Aural Skills Sequence ................................... (4)
- Musc 203: Popular and Classical Musics of the World ......................... (3)
- Musc 310, 311, 312: Music History Survey I, II, III .................. (6)
- Musc 490: Seminar in Music ............................................................... (3)

Supporting Courses in Music
- Applied lessons (one instrument or voice) ............................................ (8)
- Musc 150, 151: Class Lessons: Guitar .................................................. (2)
- Musc 150, 151: Class Lessons: Voice, and/or Percussion .................... (4)
- Musc 140: Methods: Percussion, Jazz Improvisation ........................ (4)
- Piano Proficiency through Level III or Musc 133/136/233/236, Keyboard Skills Sequence ......................... (4)
- 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 Theory and Methods I ............................... (3)
- Musc 281: Music Therapy Techniques I ............................................. (2)
- Musc 282: Music Therapy Practicum I ............................................... (1)
- Musc 380: Music Therapy Theory and Methods II ............................ (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 .................................................. (3)

or
- Musc 397: Cooperative Education in Music (with placement approved by adviser) ...................................................... (3)

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 ................................. (2)
- T&L 315: Education of Exceptional Children ................................... (3)
- Soc 326: Sociological Statistics ......................................................... (3)
- General Electives (chosen in consultation with adviser) ........................ (6)

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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

Music majors must achieve a grade of C or better in every music course taken toward the degree in order to pass the Sophomore Proficiency.

Core Courses
- Musc 130, 134, 230, 234: Harmony and Theory Sequence .................. (12)
- Musc 131, 135, 231, 235: Aural Skills Sequence ................................... (4)
- Musc 203: Popular and Classical Musics of the World ......................... (3)
MINOR IN MUSIC
Required 21 credits:

Musc 100 .......................... Introduction to the Understanding of Music .......................... (3)
Core Courses
Musc 130, 134 .................. First-year Harmony and Theory ........................................ (6)
Musc 131, 135 .................. First-year Aural Skills ......................................................... (2)
Musc 310 or 311 .......... Music History Survey I or II ................................................. (3)
Additional Courses in Music
Performance (Applied Music, Conducting, Ensembles) ............................................ (4)
Electives in History/Literature/Theory/Composition ................................................... (6)
(May include, but not limited to, other courses in Music)
Major Core, such as 203, 230, 234, 310, 311)

College of Education and Human Development
MINOR IN MUSIC
Required 26 credits:

Musc 100 .......................... Introduction to the Understanding of Music .......................... (3)
Core Courses
Musc 130, 134 .................. First-year Harmony and Theory ........................................ (6)
Musc 131, 135 .................. First-year Aural Skills ......................................................... (2)
Musc 256 .................. Basic Conducting ................................................................. (2)
Musc 310 or 311 .......... Music History Survey I or II ................................................. (3)
Additional Courses
Applied Music ................................................................. (3-5)
Ensembles
Musc 440 .................. Elementary Music Methods and Materials ................................ (3)

Courses
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. Fulfills humanities. credit. F/S

101. Fundamentals of Music. 3 credits. Introduction to fundamental elements of music through the study of scales, chords, basic harmonic progressions, rhythms, and terminology: E/S

399. Special Topics. 1 to 3 credits. Consent of instructor required. Specially arranged seminars or courses on variable topics not covered by regular departmental offerings. May be repeated for credit up to 6 hours. F/S

490. Seminar in Music. 3 credits. Prerequisites: Junior standing, Music 310 and 311. A seminar on various topics in the history and literature of music. Final project will consist of a 15-20 page research paper. Repeatable when topics vary. On demand.

491. Seminar. 3 credits. Prerequisite: Consent of instructor. On demand.

492. Senior Project. 2 credits. Prerequisite: Senior standing. Presentation of a recital, research paper, original composition, or similar project that meets the approval of the department. F/S

494. Special Projects. 1 to 3 credits. Individual study in an approved area of interest to the student. May be repeated for credit up to 8 hours. F/S

Music Theory and Composition
130. Diatonic Harmony. 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. F

131. Aural Skills I. 1 credit. Corequisite: Musc 130. Training in reading at sight and in aural recognition involving dictation, keyboard, and singing skills. F

133. Keyboard Skills I. 1 credit. Beginning keyboard classroom instruction in keyboard. F

134. Chromatic Harmony I. 3 credits. Prerequisite: Musc 130. The introduction of chromatic materials to the diatonic material learned in Musc 130. Topics include non-chord tones, altered chords, and modulation. Material is learned through part writing, keyboard skills, and music analysis. S

135. Aural Skills II. 1 credit. Prerequisites: Musc 131. Corequisite: Musc 134. Training in reading at sight and in aural recognition involving dictation, keyboard, and singing skills. F

136. Keyboard Skills II. 1 credit. Prerequisite: Musc 133. Intermediate classroom instruction in keyboard. S

230. Chromatic Harmony II. 3 credits. Prerequisites: Musc 133, plus 134 and 135 or permission of instructor. The continued study of chromatic materials covered in Musc 134. Material is learned through part writing, keyboard skills, and music analysis. S

231. Advanced Aural Skills I. 1 credit. Prerequisite: Musc 135. Continuation of the development of sight reading and aural recognition skills including music dictation. F

233. Keyboard Skills III. 1 credit. Prerequisite: Musc 136. Continuation of the development of fundamental piano skills with emphasis on the improvement of keyboard technique and repertoire. F

234. Music Theory since 1900. 3 credits. Prerequisites: Musc 230, 231. Music thought, techniques, and theories of the 20th century and beyond. Material is learned through musical analysis and original compositions. S

235. Advanced Aural Skills II. 1 credit. Prerequisite: Musc 231. Continuation of the development of sight reading and aural recognition skills including music dictation. S

236. Keyboard Skills IV. 1 credit. Prerequisite: Musc 233. Continuation of the development of fundamental piano skills with emphasis on the improvement of keyboard technique and repertoire. S

423. Instrumental and Choral Arranging. 2 credits. Prerequisite: Musc 134. 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. S/S


427. Analysis of Musical Form. 2 credits. Prerequisite: Musc 230. Analysis of the principal forms of musical composition. S/2


429. Composition. 2 credits (repeatable). Prerequisite: Musc 134. Original composition in smaller forms for vocal and instrumental solos and ensembles. F/S

Music History and Literature
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.

203. Popular and Classical Musics of the World. 3 credits. A study of the music of selected cultures of the world and ethnic sub-cultures in America; includes Native American, Jazz, Popular, and World music. S/2

276. Collegium Musicum. 1 to 4 credits not to exceed 1 credit per semester. Study and performance of vocal and instrumental music of the Medieval, Renaissance, and Baroque eras and other selected compositions which are rarely performed. On demand.

310. Music History Survey I. 3 credits. Prerequisite: Musc 134 or instructor’s permission. A historical survey of western art music from Ancient Times to 1650. F

311. Music History Survey II. 3 credits. Prerequisites: Musc 133 and 134 or permission of the instructor. A historical survey of western art music from 1650 to the present. F

414. Piano Literature. 3 credits. Prerequisite: Musc 354 or 355. Piano, or consent of the instructor. Study and analysis of keyboard music from the Baroque period to the present, with attention to the development of forms, techniques, and styles. S/2

415. Song Literature. 2 credits. Prerequisites: Musc 254 or 255, Voice. Representative song literature of Italy, France, Germany, England, Russia, Sweden, and America. On demand.

416. Choral Literature. 2 credits. Prerequisite: 3 hours of Music History and Literature. Choral literature from the Renaissance to the present with particular attention given to the representative compositions in both large and small forms. F/S

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/S

Music Therapy
180. Introduction to Music Therapy. 3 credits. An overview of the field of music therapy, an introduction to the history and principles of music therapy, to different therapy models and techniques, and to the many populations served by the discipline. This course is open to all students and professionals interested in learning more about the field. S

280. Music Therapy Theories and Methods I (Children). 3 credits. Prerequisites: Musc 180. In-depth demonstration, analysis and comparison of various music therapy models: Developmental Music Therapy, Creative Music Therapy, Clinical Orff Music Therapy and Paraverbal Therapy; a study of the theories and methods associated with these models, with special emphasis on the treatment of children. F

281. Music Therapy Techniques I. 2 credits. Prerequisite: Musc 180. Students will work on developing musical skills and technique for the design and implementation of music therapy activities in a variety of clinical settings. S

282. Music Therapy Practicum I. 1 credit. Prerequisite: Musc 281. Corequisite: Musc 281. Supervised field experience in music therapy with special needs children. The student will co-lead music therapy groups for special needs children. In addition to field placement, the student must attend a weekly on-campus seminar. F/S
380. Music Theory Techniques and Methods II (Adults). 3 credits. Prerequisite: Musc 280. In-depth demonstration, analysis, and comparison of specific music theory models, a study of the theories, methods and techniques associated with these models, with special emphasis on the treatment of adults. S

381. Music Theory Techniques II. 2 credits. Prerequisite: Musc 281. Students will work on developing musical skills and techniques for the design and implementation of music therapy activities in a variety of clinical settings. F,S

382. Music Therapy Practicum II. 1 credit. Prerequisite: Musc 282. Corequisite: Musc 381. Supervised field experience in music therapy with special adult populations. The student will co-lead music therapy groups and work with individual clients. In addition to field placement, the student must attend a weekly on-campus seminar. S

383. Music Therapy Practicum III. 1 credit. Prerequisites: Musc 381 and 382. Supervised field experience in music therapy with special adult populations. The student will co-lead music therapy groups and work with individual clients. In addition to field placement, the student must attend a weekly on-campus seminar. F,S

397. Co-operative Education in Music. 1-3 credits, repeatable to 3 credits. This course is intended for music therapy internship and for students seeking cooperative placements in the field of music therapy. All placements will be conducted under the supervision of an appropriate music professional. Arranged by mutual agreement between student, department and placement supervisor. S/U grading. F,S,SS.

400. Psychological Foundations of Music Learning. 3 credits. Prerequisites: Musc 383 and Soc 326. 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. S

411. Music Psychology IV. 1 credit. Prerequisite: Musc 383. Supervised field experience in music therapy with either special needs children or adults. The student will lead music therapy groups and work with individual clients. In addition to field placement, the student must attend a weekly on-campus seminar. F,S

420. Music Therapy Internship. 1-3 credits. Prerequisites: Completion of all Music Therapy coursework. Clinical placement at an American Music Therapy Association approved facility upon the completion of all Music Therapy coursework. The internship is a degree requirement, offering the student supervised field experience under the guidance of a professional music therapist. S/U grading only. F,S,SS.

Music Education

140. Methods: Woodwinds, Brass, Strings, Percussion, Voice. 1 credit, repeatable to 6 credits. Prerequisite: Musc 383 and minors only. Offers music education students performance and pedagogical instruction on voice and instruments in the brass, woodwind, string and percussion families. F,S


440. Methods and Materials for Elementary Music. 3 credits. Corequisite: T&L 386. Overview of methods and materials in elementary music for music majors and minors. Includes experiences for the practical application of course content. F

441. Methods and Materials for Middle and Secondary School Music. 3 credits. Prerequisites: T&L 325. Corequisite: T&L 486. Various teaching methods and strategies and the materials used in teaching middle and secondary school band, choir, orchestra, and general music programs. F,S

442. Music for Elementary School Teachers. 3 credits. Prerequisite: Admission to Teaching and Learning. Survey of elementary school music. Development of teacher skills and knowledge emphasizing conceptual understandings and musical competencies essential in the musical growth of children. Not open to music majors or minors. F,S

443. Music Methods and Materials for Elementary School Teachers. 3 credits. Prerequisite: Admission to Teaching and Learning. must be able to read music. An overview of elementary methods and materials for non-majors with a musical background. Not open to music majors or minors. S

445. Choral Methods. 3 credits. F,S

446. Instrumental Classroom Methods and Materials. 3 credits. S

455. 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.

458. 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.

449. Music Education Special Topics. 1 to 3 credits. F,S

Music Performance

a. Conducting

256. Basic Conducting. 2 credits. Prerequisite: Musc 133. Development of basic conducting techniques, baton technique, and use of the left hand. Reading of choral and instrumental scores. F

357. Choral Conducting. 2 credits. Prerequisites: Musc 236 and 256. Conducting problems and rehearsal techniques in relation to choral literature in various styles based on the text, class performance, and recordings. S

358. Instrumental Conducting. 2 credits. Prerequisite: Musc 256. Instrumental conducting, rehearsal techniques, and score reading through the use of instrumental literature of various styles and periods. S

b. Pedagogy

438. Music in the Junior High School. 1 to 4 credits. On demand.

444. Applied Music Pedagogy. 2 credits. Prerequisite: 4 semesters of Applied Music in the instrument (or voice) concerned or consent of the instructor. 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. Keyboard F/2. Voice F/2. Strings, Winds, on demand.

c. Music Ensembles

A maximum of twelve hours of credit in ensembles may apply towards graduation.

260. Concert Choir. 1 credit. Select mixed choir performing the finest choral literature from every historical era. By audition only. F,S

261. University Chamber Choir. 1 credit. Select small mixed choir focusing on a different kind of choral music every semester, from early music to jazz and theater. F,S

263. Varsity Bands Men’s Chorus. 1 credit. Varsity bands men’s chorus. Full hour ensemble specializing in traditional shorter choral works, folk songs, spirituals, and lighter fare. F,S

264. Women’s Chorus. 1 credit. Women’s vocal ensemble specializing in traditional shorter choral works, folk songs, spirituals, and lighter fare. F,S

265. Winter Concert Band. 1 credit. Winter concert band performing music ranging from the swing era to the sounds of today. By audition only. F,S

273. Instrumental Jazz Ensemble. 1 credit. Big band jazz ensemble performing music ranging from the swing era to the sounds of today. By audition only. F,S

274. Symphony Orchestra. 1 credit. Ensemble for performance of works for large orchestra. By audition only. F,S

275. University Chamber Orchestra. 1 credit. Ensemble for chamber performance of works for small orchestra. By audition only. F,S

276. Collegium Musicum. 1 to 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. On demand.

277. Chamber Music Groups. 1 credit. Any combination of strings, brass, woodwind, voice, percussion, or keyboard instruments on an ad hoc basis by a faculty member to utilize the particular talents of advanced students in exploring and performing chamber music literature. These groups will prepare compositions in such media as string quartets and trios, woodwind quintets, and vocal quartets. F,S

d. Applied Music (Group Instruction)

150. Class Lessons. 1 credit. Beginning class instruction in any of the following instrumental classes: Brass, Woodwind, Percussion, and String Class; Piano Class; Voice Class; Guitar Class. May be repeated for credit without limitation. F,S

151. Class Lessons. 1 credit. Intermediate class instruction in any of the following instrumental classes: Brass, Woodwind, Percussion, and String Class; Piano Class; Voice Class; Guitar Class. May be repeated for credit without limitation. F,S

242. Diction for Singers. 1 credit. Prerequisite: 2 semesters of private voice lessons. Rules for and practical application of two of the major languages used in song literature: Italian/English or French/German. May be repeated for credit up to 2 hours when topics vary. F/S,2

153. Individual Lessons

155. 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. F,S


155. Individual Lessons. 2 credits. Applied study of the stated instrument or voice at the freshman level. Full hour lesson. For Bachelor of Music in Performance students and others by permission of instructor. F,S

254. Individual Lessons. 1 credit. Prerequisite: 155. Applied study of the stated instrument or voice at the sophomore level. Full hour lesson. For Bachelor of Music in Performance students and others by permission of instructor. F,S


255. Individual Lessons. 4 credits. Prerequisite: MUSC 255. Applied study of the stated instrument or voice at the senior level. Half hour lesson. For Bachelor of Music in Performance students and others by permission of instructor. F,S

359. Junior Recital. 1 credit. Prerequisite: MUSC 254 or 255. Corequisites: MUSC 354 or 355. Presentation of Junior Recital. F,S
454 Individual Lessons. 1 credit. Prerequisite: Musc 354. Applied study of the stated instrument or voice at the senior level for Music, Music Education, and Music Therapy majors, and for secondary instrument for Music Performance majors. Half hour lesson, F,S.

455. Individual Lessons. 4 credits. Prerequisite: Musc 355. Applied study of the stated instrument or voice at the junior level. Full hour lesson. For Bachelor of Music in Performance students and others by permission of instructor. F,S

459. Senior Recital. 1-2 credits. Prerequisite: Musc 354 or 355. Corequisite: Musc 454 or 455. The presentation of a senior recital. SU grading only. 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 Certificate Program (NLCP)

Helgeson (Program Coordinator)

The Nonprofit Leadership Certificate 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 Certificate Program is an 18-credit complement to any major area of study. The certificate 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 certificate through coursework as well as hands-on learning through service work in the community and internships with nonprofit organizations. The Nonprofit Leadership Certificate Program is accredited by American Humanics, Inc., a national organization that establishes competencies and affiliates with nonprofit leadership programs in colleges and universities.

### College of Arts & Sciences

Certificate in Nonprofit Leadership

18 credits required, including:

A&S 200  Introduction to the Nonprofit Sector ......................... (2)
A&S 450  Capstone Experience and Development ..................... (1)
A&S 497  Internship ....................................................... (6)

Other requirements (9 credits):

Choose one 3 or 4 credit course from each of the following lists or from additional courses approved by the program coordinator.

#### Organizational

Entr 301  Accounting and Financial Concepts for Entrepreneurship .................................................. (3)
Entr 302  Marketing and Management Concepts for Entrepreneurship ............................................... (3)
Psy 301  Industrial and Organizational Psychology .................................................. (3)
Mgmt 306  Human Resource Management .................................................. (3)
Comm 303  Principles of Public Relations .................................................. (3)
Mgmt 310  Organizational Behavior .................................................. (3)
Comm 401  Organizational Communication .................................................. (3)
RLS 442  Recreation Administration .................................................. (3)

#### Service and Community

Comm 102  Communication and the Human Community .................................................. (3)
Soc 115  Social Problems .................................................. (3)
Comm 212  Interpersonal Communication .................................................. (3)
Psy 250  Developmental Psychology .................................................. (4)
TLT 252  Child Development .................................................. (3)
SWM 257  Human Behavior in the Social Environment .................................................. (4)
Soc 306  Social Change .................................................. (3)
IDS 495  Service and Citizenship .................................................. (3)
FA 150  Introduction to Fine Arts .................................................. (3)

#### Diversity

Rel 216  Religion in America .................................................. (3)
Musc 203  Popular and Classical Musics of the World .................................................. (3)
IS 121  Introduction to Indian Studies .................................................. (3)

#### Other Courses

Phil 215  Contemporary Moral Issues .................................................. (3)
Rel 216  Women and Religion .................................................. (3)
A&S 225  Introduction to the Study of Women .................................................. (3)
RHS 230  Contemporary Issues in Rehabilitation .................................................. (3)
Soc 230  Diversity in American Society .................................................. (3)
Phil 373  Ethics in Business and Public Administration .................................................. (3)
Comm 402  International/Intercultural Communication .................................................. (3)
Psy 421  Individual and Group Differences .................................................. (3)
Psy 465  Multicultural Psychology .................................................. (3)

Note: Students may “double use” courses for this Certificate and for their majors or minors.

#### Courses (A&S)

200. Introduction to the Nonprofit Sector. 2 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,S

450. Capstone Experience and Development. 1 credit. Prerequisite: A&S 200. Students will be asked to develop an integrative paper and complete a competency portfolio conveying what they have learned from the certificate program. Students are required to attend the American Humanics Management Institute. The American Humanics Management Institute is a 3-4 day, intensive national management institute, organized by students from across the country affiliated with American Humanics, Inc., featuring workshops, seminars, and simulations. 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 (approx. $600-800), or pay their own expenses. Fund raising efforts provide a hands-on learning experience prior to the Institute. S

497. Internship for Nonprofit Leadership Certificate. 3-6 credits (repeatable to 6 credits). Prerequisite: A&S 200. Intended to be the cumulative application of the Nonprofit Leadership Certificate competencies for students. The internship is a short-term work experience emphasizing hands-on learning. The internship incorporates education and professional development in a nonprofit agency. F, S, SS

### Nursing (Nurs)

Adams, C. Anderson, J. Anderson, Chae, Christian, Covington (Dean), Evanston, Gragert, Guido, Hanson, Harsell, Heuer, Hunter, Hurley, Ide, Lindseth, Macejkovic, Melland, Morris, Odermann, Rudel, Seal, Stahl, Staffenecker, B. Thompson, P. Thompson, Tyree, Vari, Wright and Yurkovich

### College of Nursing

The graduate receives the Bachelor of Science in Nursing (B.S.N.) degree and is eligible to take the national board examination 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.

Information on any newly approved programs or changes in programs/major since the printing of this catalog will be available on the Nursing web site at: www.nursing.und.edu.

The nursing program admits students in March (to fill a fall class) and October (to fill a spring class). 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: www.nursing.und.edu/bsn.

Application: Approximately 50 students are admitted each semester, determined by the availability of faculty and clinical facilities. Selection is made on the basis of academic record of core courses and points awarded for the personal statement submitted by each applicant and reviewed by nursing faculty. Students who are resubmitting a qualified application may be eligible for additional consideration. Prospective students should contact their adviser or the College of Nursing Admissions and Records Associate for the specifics
of the selection process and procedures. Applicants who are not granted admission for the semester they requested are eligible to reapply.

To be eligible for consideration for admission to the nursing major, the student applying must first be admitted to UND, must have an active U-mail account, and must have completed the following courses or equivalents with a grade of C or better:

- English 110
- English 120/125
- General Chemistry w/lab (Chem 115/115L or Chem 121/121L)
- Organic and Biochemistry w/lab (Chem 116/116L)
- Human Anatomy with lab (Anat 204/204L)
- Introduction to Psychology (Psyc 111)
- Introduction to Sociology (Cultural Anthropology or Social Problems may be taken in place of Introduction to Sociology)
- Developmental Psychology (Psyc 250) or Abnormal Psychology (Psyc 270)
- College Algebra (Math 103) or equivalent

*Courses which are used in the “core” GPA calculation for admission

Additionally, applicants must have earned at least a 2.50 overall and UND GPA (higher core GPAs will be more competitive). College Level Examination Program (CLEP) subject exam results, math placement results, and English Composition waivers will be accepted according to current university policy.

**Admission:** Upon notice of admission to the nursing program, documentation of the following verifications of immunizations, tests, or certifications must be submitted to the College of Nursing. Failure to do so by the deadline provided (August 15 for Fall Admission or December 31 for Spring Admission) can result in loss of nursing placement. A non-refundable $75 deposit on the program fee will also be required. The minimum GPA of 2.50 must be maintained. All immunizations, tests, or certifications must be current and may not expire prior to beginning the nursing curriculum. Updates or recertification must be completed prior to starting classes each semester.

1. Submit copy of CNA course completion documentation and Certified Nursing Assistant (CNA) certification.
2. Current medical/hospitalization Insurance or Certification of Assumption of full responsibility for any health care treatment costs incurred.
3. Proof of immunity to chicken pox (varicella)
4. Proof of immunity to measles (rubella), mumps & rubella (2 MMR immunizations)
5. Two negative TB tests (Mantoux) with the last test current for the entire semester of admission; thereafter, students must submit an annual TB test.
7. Hepatitis B antibody titre, a test for immunity following vaccination, after the Hepatitis B series is completed. (Anti-HBs is the antibody test to hepatitis B surface antigen)
8. Current CPR certification by the American Red Cross or American Heart Association to include adult, infant and child and one- and two-person CPR. Certification must be renewed annually in the nursing program.

Additional courses to complete prior to beginning nursing courses:

- Microbiology 202/Lab
- Human Physiology 301
- Nutrition 240
- Abnormal Psychology 270 and Developmental Psychology 250

**NOTE:** Students will be automatically assigned to the catalog active at the time of admission to the Nursing program unless they request otherwise.

Students may petition to establish credit through special examinations according to University policy. Equivalency of courses on other campuses with those at UND should be verified by contacting the College of Nursing as early as possible.

**Admission of Transfer Students.** Students transferring to the nursing major from other accredited institutions must fulfill the same minimum prerequisite requirements as current University of North Dakota students. The first requirement for admission to the Nursing program is admission to UND. The dates for submission of the application and consideration of applicants are the same for all students. Students seeking to transfer to the College of Nursing from other accredited institutions are advised to correspond with the College of Nursing before applying for admission to the University of North Dakota. During that admission process the student’s transfer work will be evaluated. Equivalency of courses from other campuses should be verified by contacting the College of Nursing as early as possible. All qualified students are considered on merit. Because of the number of applicants, students cannot be guaranteed admission to the nursing major. The number of applicants typically exceeds the available spaces; therefore, students cannot be guaranteed admission to the nursing major.

**Licensed Practical Nurses (LPNs).** LPNs interested in pursuing a bachelor’s degree are considered for admission as transfer students. Further information concerning the progression of the LPN student can be obtained by contacting the College of Nursing at: www.nursing.und.edu. Transcripts of previous academic work must be submitted as part of the application to the University and to the nursing program. Some nursing courses may be waived for applicants who are LPNs.

**Additional Expenses.** In addition to the regular university tuition and fees, nursing students are charged a nursing program fee each semester. One half of the first semester’s program fee ($75) is due upon acceptance of a position in the nursing program at UND and is non-refundable. Costs of laboratory tests and immunizations required for the protection of the student and client (e.g., TB skin test, hepatitis vaccination, and health care insurance costs) are the responsibility of the student. There are additional expenses related to uniforms and clinical equipment, graduation, and licensure. An estimated expense sheet is available from the College of Nursing 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 enter the nursing curriculum, as they progress through the curriculum, and prior to graduation. If, after two attempts, a benchmark score is not attained on exams reflective of course content, students are required to enroll in a one credit remediation course in the next semester. If after enrolling in the remedial course the student does not achieve the benchmark score after retaking the exam twice, the student may not progress in the nursing curriculum. Students must also achieve a benchmark score on an exam predictive of success on the licensing exam administered prior to graduation before being deemed qualified to sit for the licensing exam.

**B.S. IN NURSING**

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. General Education Requirements including 9 credits of Arts and Humanities, 9 credits of Communications and approximately 3 credits of other electives. A minor program with three (3) credits of the General Education Requirements must meet the World Culture designation (See University GER listing). 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:

**Freshman level (Pre-Nursing) – Semester One**

- *Engl 110* College Composition I .................................................(3)
- *Chem 115/115L* Introductory Chemistry and Lab .................................(4)
- *Chem 121/121L* General Chemistry I and Lab ......................................(4)
- *Psyc 111* Introduction to Psychology ...............................................(3)
- *Soc 110* Introduction to Sociology ......................................................(3)
- *Soc 115* Social Problems ........................................................................(3)
- *Anth 171* Cultural Anthropology .........................................................(3)
- *Math 103* College Algebra ......................................................................(3)

**Freshman level (Pre-Nursing) – Semester Two**

- *Engl 120* Composition II ......................................................................(3)
- *Engl 125* Technical & Business Writing ................................................(3)
- *Chem 116/116L* Intro to Organic & Biochemistry/Lab .............................(4)
- *Psyc 250* Developmental Psychology ..................................................(4)
- *Psyc 270* Abnormal Psychology ............................................................(3)
- *Arts & Humanities* .................................................................................(3)

**Sophomore level (Pre-Nursing) – Semester Three**

- #PPT 301 Mechanics of Human Physiology/Lab .....................................(4)
- #MBio 302/302L Intro to Medical Microbiology/Lab (Fall only) ..............(5)
- *Psyc 250* Developmental Psychology ..................................................(4)
- *Psyc 270* Abnormal Psychology ............................................................(3)
- *Nurs 240* Fundamentals of Nutrition .....................................................(3)
- *Communication GER* ..........................................................................(3)

**Sophomore level (Nursing) – Semester Four**

- PPT 315 Introduction to Pharmacology ...................................................(3)
  (Spring only or online)
- NUR 425 Health Promotion (theory only) ................................................(2)
- NUR 426 Functional Changes in Aging (theory only) ..............................(2)
- NUR 428 Professional Role Development I (theory only) ......................(2)
- NUR 432 Pathophysiology (theory only) ...................................................(3)
- NUR 433 Assessment Across the Life Span .............................................(4)
  (3 hours theory and 3 hours lab per week)

**Junior level (Nursing) – Semester Five**

- NUR 427 Adult Nursing Care I .................................................................(4)
- NUR 428 Childbearing Family .................................................................(2)
- Statistics Soc 326, Psyc 241 or Econ 210 .........................................................(3-4)
- *Arts & Humanities* .................................................................................(3)

**Junior level (Nursing) – Semester Six**

- NUR 426 Adult Nursing Care II ...............................................................(2)
  (theory only)
- NUR 429 Public Health Nursing Theory ..................................................(2)
  (theory only)
- NUR 432 Advanced Nursing Procedures .................................................(1)
  (3 hours lab per week)
- NUR 433 Research .....................................................................................(2)
- NUR 434 Adult Nursing Care II Clinical ...................................................(4)
  (12 hours clinical per week)
- NUR 436 Public Health Nursing Clinical ...................................................(2)
  (6 hours clinical per week)
- *Arts & Humanities* .................................................................................(3)

**Senior level (Nursing) – Semester Seven**

- NUR 471 Child Health Nursing .................................................................(3)
  (2 hours theory, 3 hours clinical per week)

**Senior level (Nursing) – Semester Eight**

- NUR 472 Psych/Mental Health Nursing ...................................................(4)
  (2 hours theory, 6 hours clinical per week)
- NUR 473 Multisystem Complex AH .........................................................(4)
  (2 hours theory, 6 hours clinical per week)
- Elective ......................................................................................................(2)

**PROGRESSION AND CLINICAL 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 the number of semesters to complete the curriculum, i.e., part time, must see their advisor and notify the Admissions & Records Associate so their name may be placed on a waiting list.

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, science and support courses, to progress to the next semester of nursing courses and for graduation from the College of Nursing.
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 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 undergraduate student handbook.

**RN/BSN OPTION**

**NURSING CURRICULUM SEQUENCE**

Students in the RN/BSN option program may attend classes either full or part-time. Thirty semester credits of UND nursing coursework are required (see below). In addition, students must complete all UND general education requirements, RN/BSN program prerequisites and UND graduation requirements. A minimum of 129 credits and a minimum grade point average of 2.50 are required for graduation.

**Admission Requirements.** The following courses or their equivalents must be either completed at UND or accepted by the nursing program as transfer credit prior to beginning nursing courses:

- English Composition 110 and 120 or 125
- Psychology 111 (Introductory)
- Developmental Psychology 250
- Sociology 110 (Introductory) or 115 (Social Problems) or
- Anthropology 171 (Cultural)
- Anatomy 204, 204L
- PPT 301 (Physiology)
- Microbiology 202, 202L
The following are the courses remaining for RN/BSN students after establishing credit for prior associate degree or diploma education. All are offered through distance delivery.

**Curriculum**

The following forms the courses remaining for RN/BSN students after establishing credit for prior associate degree or diploma education. All are offered through distance delivery.

**Elective Nursing Courses**

A minimum of eight elective Nursing credits are to be chosen from the courses listed below. Not all courses are available through distance delivery.

- **NURS 284** Functional Changes in Aging ................................................. (2)
- **NURS 322** Nursing Care of Diverse Families ........................................... (3)
- **NURS 394** Independent Study ............................................................ (1-4)
- **NURS 400** Special Topics ................................................................. (2-3)
- **NURS 401/501** Complementary Healthcare Therapies ................................ (3)
- **NURS 418** Physical Changes in Aging .................................................... (3)
- **NURS 420** Interprofessional Health Care ................................................. (1)
- **NURS 425** Nursing Practice Theory ...................................................... (2)
- **NURS 473** Multisystem Complex Adult Health ....................................... (4)
- **NURS 475** Nursing Practice ................................................................. (4)
- **NURS 476** Complex Child Bearing Family ............................................... (4)
- **NURS 489** Seniors Honors ...................................................................... (6-15)

In addition, students must meet all UND General Education Requirements. This will typically include an additional three credits of Communication and nine credits of Arts & Humanities. 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.

**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 experiences may be at places distant from Grand Forks.

**282. Health Promotion.** 2 credits. Pre- or corequisites: Nursing major, Nurs 284, 303. This course focuses on the promotion of health across the lifespan based on national health objectives. Lecture. F.S

**284. Functional Changes in Aging.** 2 credits. Pre- or corequisites: Nursing major, Nurs 282, 302, 303. This course deals with normal aging and the functional and psycho-social changes that occur. Lecture. F.S

289. Professional Development I. 2 credits. Pre- or corequisite: Nursing major. An introduction to professional nursing practice is provided, with exploration of major factors guiding the practice of nursing. Lecture. F.S

297. Cooperative Ed: Pre-Nursing. 1-2 credits per term. Restricted to pre-nursing majors. An experiential/service learning experience through a health care or leadership position. Students are employed by selected agencies/Company on the parallel, alternative, or summer plan. Hours are arranged by mutual agreement among student, coordinator, and employer. Clinical. S/U grading only. F.S,S.S.

302. Pathophysiology. 3 credits. Prerequisite: Nursing major, PPT 301. The focus of this course is the application of concepts of altered health in the development of clinical manifestations of disease and illness. Lecture. F.S


321. Nursing Procedures. 2 credits. Prerequisites: Nurs 282, 289, 302, 303. Pre- or corequisites: PPT 315, Nurs 371. Acquisition and application of foundational nursing procedures supported by the nursing process and theoretical concepts. Lecture/lab. F.S.

322. Nursing Care of Diverse Families. 3 credits. Prerequisites: Nurs 282, 284, 289, 302, 303. 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. F.S.

323. Adult Nursing Care II. 2 credits. Prerequisites: Nurs 321, 322, 371, 372, PPT 315. Corequisites: Nurs 325, 373. This course focuses on the nursing care of adult patients with a variety of conditions, with a primary emphasis on acute health alterations. Lecture. F.S.


325. Advanced Nursing Procedures. 1 credit. Prerequisites: Nurs 321, 322, 371, 372. Corequisites: Nurs 323, 373. Advanced nursing procedures are acquired and applied through simulated laboratory experiences. Laboratory. F.S.

326. Research. 2 credits. Prerequisites: Nurs 321, 322, 371, 372, and Soc 326, or Psych 241, or Econ 210. Introduction to nursing research with a focus on interrelationships among nursing practice, theory, and research. Lecture/Discussion. F.S.

350. Nursing in Transition. 3 credits. This course covers two distinct essentials for nurses returning for their 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.

371. Adult Nursing Care I. 4 credits. Prerequisites: Nurs 284, 289, 302, 303. Pre or co-requisite: PPT 315. Corequisite: Nurs 321. 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. F.S

372. Childbearing Family. 2 credits. Prerequisites: Nurs 282, 284, 289, 302, 303. Corequisites: Nurs 321, 322. This course concentrates on the delivery of nursing care to the healthy childbearing family. Lecture/Clinical. Successful completion of the non-credit clinical component of the course is required. F.S

373. Adult Nursing Care II Clinical. 4 credits. Prerequisites: Nurs 321, 322, 371, 372, 373. Corequisites: Nurs 325, 373. Applications 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. F.S.


389. Honors Tutorial. 3-4 credits. Supervised independent study in nursing for students enrolled in the 4-year Honors Program.

394. Independent Study. 1-4 credits. May be offered at the discretion of the student, faculty member, and college. Supervised independent study of non-honors students in nursing. May be repeated up to 9 credits. Open to juniors and seniors in the nursing program.

397. Cooperative Ed: Nursing. 1-2 credits per term. Prerequisites: Nursing major; Nurs 321, 371; minimum overall GPA of 2.50. An experiential learning experience in nursing integrating clinical work experience, nursing theory and evaluation. Designed to enhance the student’s prior coursework 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, S/U grading only. Clinical, F.S.

400. Special Topics. 1-4 credits. May be open to non-majors. Elective opportunities offered in the College of Nursing which may be a combination of special projects, seminars, and clinical experience.

401. Complementary Healthcare Therapies: Interdisciplinary Implications for Self-Care, Practice and Research. 3 credits. The focus of this elective course is the analysis of theory, research, and practice of complementary health therapies. The goal of the 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.
418. Physical Changes in Aging. 3 credits. Focus is on common physiological changes of aging and their impact on the older adult’s ability to function. Lecture/ discussion. Open to non-majors. S

420. Interprofessional Health Care. 1 credit. Prerequisite: Nurs 481 (course number in current curriculum through Fall 2008) or Nurs 473 (course number in new curriculum beginning Spring 2009). 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. Professions include: physical therapy, nursing, occupational therapy, medicine, social work, communication science disorders, clinical lab sciences, physician assistant, and dietetics. Seminar F, S

425. Practicum Theory. 2 credits. Prerequisites: Nurs 471, 472, 473. Corequisite: Nurs 475. Emphasis is on concepts related to assuming a professional nurse role. Analysis and evaluation focus on the transition process, nursing regulations, quality improvement, and other concepts contributing to professional performance. Lecture/Discussion. F.S.

471. Child Health Nursing. 3 credits. Prerequisites: Nurs 323, 324, 325, 326, 373, 374. 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. F.S.

472. Psys/Mental Health Nursing. 4 credits (2 lecture, 2 clinical). Prerequisites: Nurs 323, 324, 325, 326, 373, 374. Emphasis is on interactive processes, and dynamics of human diversity and behavior in mental health promotion, maintenance, and restoration. Lecture/Discussion/Clinical. F.S.

473. Multisystem Complex Adult Health. 4 credits. Prerequisites: Nurs 323, 324, 325, 326, 373, 374. Complex concepts are integrated into the management of nursing care of adults with multisystem health problems. Lecture/Clinical. F.S.

474. Professional Development II. 5 credits. Prerequisites: Nurs 471, 472, 473. 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. F.S.

475. Practicum. 4 credits. Prerequisites: Nurs 471, 472, 473. Corequisite: Nurs 425. 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. F.S.

476. Complex Childbearing Family. 2 credits. Prerequisites: Nurs 471, 472, 473. This course concentrates on the delivery of nursing care to complex, high risk childbearing families. Lecture/Clinical. F.S.

489. Senior Honors Thesis. 1 to 8 credits; total not to exceed 9. Prerequisite: consent of the department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F.S.

490. Transcultural Health Care Theories, Research and Practice. 3 credits. Prerequisite: Junior standing or permission of instructor. 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. F.S.

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### Nutrition and Dietetics (N&D)

**Goodwin, Hall (Chair) and Zikmund**

The primary mission of the Department of Nutrition and Dietetics is to provide academic preparation and supervised practice experience for future professionals in the fields of 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

The major in Community Nutrition enables students to develop a thorough understanding of the science of nutrition as well as the ability to communicate nutrition principles effectively and accurately to the public. 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. Any graduate completing N&D 441 — Advanced Nutrition is eligible to become a Licensed Nutritionist (L.N.) in the state of North Dakota. To graduate, the Community Nutrition major must earn a “C” or better in all nutrition, foods, and science courses and must maintain a minimum grade point average of 2.2.

The Coordinated Program in Dietetics combines academic preparation with supervised practice experiences for students who wish to become a Registered Dietitian (R.D.). Students work in a variety of settings to assist clients to improve or maintain nutritional health. Upon completion of this degree, the graduate is eligible to take the examination for professional registration and to apply for active membership in the American Dietetic Association. Students apply for admission to the professional phase of the program during the second semester of the sophomore year or when they have completed the pre-professional requirements. A minimum grade point of 2.60 and a minimum of a “C” grade in all science, foods, and nutrition courses are required for acceptance, progression, and graduation. The Coordinated Program in Dietetics is fully accredited by the Commission on Accreditation for Dietetics Education of the American Dietetic Association, a specialized accrediting body recognized by the Council for Higher Education Accreditation and the United States Department of Education.

Information about changes in these majors since the printing of this catalog will be available on the department website at: http://www.nursing.und.edu/nutrition.

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### College of Nursing

**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. General Education Requirements (see University GER listing).

II. Prerequisite Courses:

- Engl 110 .......... College Composition I ............................... (3)
- Engl 125 .......... Technical and Business Writing .................. (3)
- *Chem 121, 121L .......... General Chemistry I & I Laboratory .................................................. (8)
- *Chem 240, 240L Survey of Organic Chemistry and Laboratory ..........(5)
- *BMB 301 Biochemistry ................................................. (5)
- Anat 204/204L Anatomy for Paramedical Personnel and Laboratory ...... (5)
- Biol 150, 150L General Biology I and Laboratory ....................... (4)
- PPT 301 Human Physiology .............................................. (4)
- Psy 111 Introduction to Psychology ...................................... (3)
- Math 103 College Algebra ................................................ (3)
- Mkt 201 Personal Marketing .............................................. (3)
- Soc 326 Sociological Statistics ......................................... (3)
- or
- Psy 241 Introduction to Statistics ...................................... (4)
- Comm 110 Fundamentals of Public Speaking ................................. (3)
- Comm 212 Interpersonal Communication .................................. (3)
- Comm 366 Business and Professional Speaking ......................... (3)
- RHS 200 Helping Skills in Community Services ......................... (3)
- T&L 252 Child Development ............................................. (3)
- Psy 250 Developmental Psychology ....................................... (4)

III. Required Courses:

- N&D 100 Introduction to Nutrition and Dietetics .......................... (1)
- N&D 200 Nutrition Promotion Strategies .................................. (2)
- N&D 220 Foodservice Safety and Sanitation ................................ (1)
- Nutr 240 Fundamentals of Nutrition ..................................... (3)
- N&D 241 Maternal and Child Nutrition .................................... (2)
- N&D 242 Nutrition in the Aging Process ................................... (2)
- N&D 335 World Food Patterns ............................................ (3)
- N&D 342 Community Nutrition ............................................ (3)
- N&D 400 Professional Issues ............................................... (2)
- N&D 441 Advanced Nutrition .............................................. (4)
- N&D 494 Research in Nutrition and Dietetics ............................ (1)
- N&D 498 Supervised Practice in Nutrition and Dietetics .............. (4)
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 (1)
N&D 494 Research in Nutrition and Dietetics (2)

Option B:

Soc 335 The Family (3)
PESX 327 Fitness for Life (3)
N&D 348 Sports Nutrition (1)
Soc 355 Drugs and Society (3)
PPT 315 Human Pharmacology (3)
PPT 410 Drugs Subject to Abuse (2)
Soc 352 Aging (3)
Psy 355 Adulthood and Aging (3)

*N: Mgmt 305 Managerial Concepts may be substituted for N&D 220, 340, and 440.

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. General Education Requirements (see University GER listing).

II. The following curriculum:

Pre-professional requirements:

Engl 110 College Composition I (3)
Engl 125 Technical and Business Writing (3)
Anat 204 and 204L Anatomy for Paramedical Personnel and Laboratory (5)

Chem 121, 121L General Chemistry I and Laboratory (4)
Chem 240, 240L Survey of Organic Chemistry and Laboratory (3)
Math 103 College Algebra (3)
Mkt 201 Personal Marketing (3)
N&D 100 Introduction to Nutrition and Dietetics (1)
N&D 200 Nutrition Promotion Strategies (2)
Nur 240 Fundamentals of Nutrition (3)
N&D 241 Maternal and Child Nutrition (2)
N&D 242 Nutrition in the Aging Process (2)
N&D 260 Principles of Foods and Food Science (5)
N&D 335 World Food Patterns (3)
PPT 301 Mechanics of Human Physiology (3)
Psy 111 Introduction to Psychology (3)
RHS 200 Helping Skills in Community Services (3)
Comm 110 Fundamentals of Public Speaking (3)

Professional Dietetics Requirements:

BMB 301 Biochemistry (3)
Mgmt 305 Managerial Concepts (3)
Psy 241 Introduction to Statistics (4)
Soc 220 Sociological Statistics (3)
N&D 220 Foodservice Safety and Sanitation (1)
N&D 340 Foodservice Systems Production (2)
N&D 342 Community Nutrition (3)
N&D 350 Medical Nutrition Therapy I (2)
N&D 400 Professional Issues (2)
N&D 440 Foodservice Systems Management (1)
N&D 441 Advanced Nutrition (4)
N&D 450 Medical Nutrition Therapy II (3)
N&D 480 Interprofessional Health Care (1)
N&D 491 Dietetic Seminar (1)
N&D 494 Research in Nutrition and Dietetics (3)
N&D 498 Supervised Practice in Nutrition and Dietetics (24)

MINOR IN NUTRITION

A minor in Nutrition requires successful completion of at least 20 credits taken from the following list of courses. Selection of courses should be made in consultation with a faculty member in the Department of Nutrition and Dietetics.

N&D 100 Introduction to Nutrition & Dietetics (1)
N&D 200 Nutrition Promotion Strategies (2)
N&D 220 Foodservice Safety and Sanitation (1)
N&D 241 Maternal and Child Nutrition (2)
N&D 242 Nutrition in the Aging Process (2)
N&D 260 Principles of Foods & Food Science (5)
N&D 335 World Food Patterns (3)
N&D 340 Foodservice Systems Production (2)
N&D 342 Community Nutrition (3)
N&D 348 Sports Nutrition (1)
N&D 400 Professional Issues (2)
N&D 440 Foodservice Systems Management (1)
N&D 441 Advanced Nutrition (4)
N&D 450 Medical Nutrition Therapy II (3)
N&D 480 Interprofessional Health Care (1)

Courses

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 only. S

200. Nutrition Promotion Strategies. 2 credits. Prerequisites: Nutr 240, N&D 241 and 242. Study of communication and educational theories and techniques used to promote nutritional well-being with applications for a culturally diverse population. S

205. 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. F

240. Fundamentals of Nutrition. 3 credits. Basic principles of nutrition with application for individuals and family groups. FS

241. Maternal and Child Nutrition. 2 credits. Prerequisite: Nutr 240. Investigation and application of nutrition as it impacts the growth and development of humans, including pregnancy, infancy, childhood, and adolescence with emphasis on recommendations for promoting healthy lifestyles for each life stage. F

242. Nutrition in the Aging Process. 2 credits. Prerequisite: Nutr 240. Application of physiological, socio-psychological, and educational aspects of nutrition as it impacts the health and well-being of people as they age. F

260. Principles of Foods and Food Science. 5 credits. Prerequisite: College level chemistry course. 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. S

335. World Food Patterns. 3 credits. Examination of the food patterns selected worldwide population groups considering the effect of social, cultural, and economic practices on nutritional values. S

340. Foodservice Systems Production. 2 credits. Prerequisites: N&D 260. Principles of food production as applied to preparation, service, and evaluation of foods; use and operation of food service equipment. F

342. Community Nutrition. 3 credits. Prerequisites: N&D 241, 242 or consent of instructor. Application of nutrition principles to populations in various community environments and stages of life cycle with consideration given to interrelated health, social, and economic concerns. S

348. Sports Nutrition. 1 credit. Prerequisites: Nutr 240 & PPT 301. Overview of the specialized nutritional needs of the athlete. S/2

350. Medical Nutrition Therapy I. 2 credits. Prerequisites: N&D 241, 242 and PPT 301. The study and application of nutritional assessment techniques, nutrition care planning methodologies, interviewing and counseling skills, and medical nutrition therapy for common medical conditions. F

397. Cooperative Education. 1-2 credits per semester. This course provides practical work experience with an employer closely related to the student’s major and professional goals. S/U grading only. FS/SS

400. Professional Issues. 2 credits. Prerequisites: Senior status and consent of instructor. Analysis of professional issues including but not limited to: grandmanship, marketing, professional presentations, and complementary therapies in nutrition and dietetics. Development of skills to address such issues. F

400. Foodservice Systems Management. 1 credit. Prerequisite: N&D 340. Applies principles of management to quantity and quality food production and analysis. F

441. Advanced Nutrition. 4 credits. Prerequisites: Nutr 240, Chem 116 or 240, and PPT 301. A comprehensive investigation of the nutritional needs of humans with emphasis on nutritional biochemistry and current issues. S

450. Medical Nutrition Therapy II. 3 credits. Prerequisites: N&D 350 and 441. The study and application of nutritional intervention principles and medical nutrition therapy for complex medical conditions. S

480. Interprofessional Health Care. 1 credit. Prerequisite: Senior standing in Dietetics. 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. S/U grading. S
Occupational Safety and Environmental Health (OSEH)

Diez (Program Coordinator)

The Occupational Safety and Environmental Health (OSEH) program is a 58-hour major leading to the baccalaureate degree, bachelor of science. The OSEH program is administered by the Department of Technology. It has a 31-semester hour core of interdisciplinary coursework, which provides a sound professional background. The remaining 27 hours are selected from one of two technical concentrations: Industrial Safety or Industrial Hygiene. The degree program draws coursework from 12 academic departments and utilizes resources from the University’s Office of Safety and Environmental Health.

ADMISSION PROCESS

Admission to the occupational safety and environmental health major program of study is on a competitive basis. Ten students may be admitted per academic year. Students not meeting these minimum requirements may be admitted with probationary status upon recommendation of the Occupational Safety and Environmental Health Admissions Committee.

ADMISSION REQUIREMENTS

A. A student must have completed the equivalent of 58 semester hours of coursework.

B. A student must have completed the following courses (or equivalents) with a minimum grade of C:

- Chemistry 121 & 122 & Laboratories ............... 8 hours
- Math 103 .................................................. 3 hours
- ISys 117/317 ............................................. 4 hours
- Phys 161 and Laboratory .................................. 4 hours
- Biol 150 & Laboratory .................................... 4 hours

C. A student must have completed 15 hours in residence at the University of North Dakota with a minimum of 2.2 GPA. Transfer students will have official transcripts evaluated to determine the 15-hour requirement.

ADMISSION PROCEDURE

Obtain the application packet and submit:

A. The application form
B. One reference (sent directly to the University of North Dakota by the person writing the reference)
C. An official transcript of previous coursework (sent by your institution directly to UND).
D. Essay on “Rationale for Applying for Admission to the Occupational Safety and Environmental Health Program, University of North Dakota” (part of application packet).

E. The submitted materials will be examined, analyzed, and a decision will be made on your application. You will receive written notice of that decision. The decision may be that you have been accepted, placed on the waiting list for a succeeding semester, or denied for admission.

College of Business and Public Administration

B.S. IN OCCUPATIONAL SAFETY AND ENVIRONMENTAL HEALTH

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. OSEH Admission Requirements (see above)

OCCUPATIONAL SAFETY AND ENVIRONMENTAL HEALTH CURRICULUM:

58 credits to include:

- Math 146 .......... Applied Calculus I ............................................. (3)
- Anat 204 .......... Anatomy for Paramedical Personnel ............... (3)
- Econ 210 .......... Intro to Business & Economic Statistics .......... (3)
- Psy 301 .......... Industrial & Organizational Psychology .......... (3)
- IT 203 .......... Production Process: Manufacturing ............... (3)
- OSEH 345 .......... Emergency Response .................................. (2)
- PEXS 310 .......... First Aid .................................................. (2)
- Engl 125 .......... Business & Technical Writing .................... (3)
- Acct 315 .......... Business in the Legal Environment ............... (3)
- Mgmt 300 .......... Principles of Management ......................... (3)
- Human Resources Management ............................................ (3)

Plus one of the following two options:

INDUSTRIAL SAFETY CONCENTRATION (OPTION I)

Required: 27 credits including:

1. The following 15 credits:

- OSEH 305 .......... Fire Safety .................................................. (2)
- OSEH 325 .......... Construction Safety ...................................... (3)
- OSEH 355 .......... Inspections .................................................. (1)
- OSEH 405 .......... Industrial Hygiene ....................................... (3)
- OSEH 425 .......... OSEH Seminar ............................................. (3)
- OSEH 440 .......... Industrial Safety ............................................. (3)

2. 12 credits selected from the following:

- CEN 444 .......... Contracts and Specifications ......................... (3)
- IT 122 .......... Computer Aided Design/Drafting ...................... (3)
- IT 337 .......... Cooperative Education .................................... (1-3)
- IT 400 .......... Teaching Technology Education .................... (3)
- OSEH 226 .......... Transportation Safety ................................. (3)
- OSEH 365 .......... Radiation .................................................. (2)
- OSEH 375 .......... Asbestos ..................................................... (2)
- OSEH 385 .......... Instrumentation ............................................ (2)
- OSEH 395 .......... Hazardous Materials Management ............... (3)
- OSEH 435 .......... Risk Management ....................................... (3)
- OSEH 465 .......... Product Safety and Liability ....................... (3)

INDUSTRIAL HYGIENE CONCENTRATION (OPTION II)

Required: 27 credits including:

1. The following 17 credits:

- Chem 209 .......... Quantitative Analysis .................................. (4)
- OSEH 405 .......... Industrial Hygiene ....................................... (3)
- PPT 410 .......... Drugs Subject to Abuse .................................. (2)
- OSEH 425 .......... OSEH Seminar ............................................. (3)

2. 10 credits selected from the following:

- IT 122 .......... Computer Aided Design/Drafting ...................... (3)
- IT 337 .......... Cooperative Education .................................... (1-3)
- IT 397 .......... Cooperative Education .................................... (1-3)
- IT 400 .......... Teaching Technology Education .................... (3)
- OSEH 355 .......... Inspections .................................................. (1)
- OSEH 365 .......... Radiation .................................................. (2)
- OSEH 375 .......... Asbestos ..................................................... (2)
- OSEH 385 .......... Instrumentation ............................................ (2)
- OSEH 395 .......... Hazardous Materials Management ............... (3)
- OSEH 440 .......... Industrial Safety ............................................. (3)

GRADUATION REQUIREMENTS FOR THE BSOSEH DEGREE

Students must achieve the following to graduate with the Bachelor of Science in Occupational Safety and Environmental Health administered through the Department of Technology and the College of Business and Public Administration.
1. Meet the applicable graduation requirements of the College of Business and Public Administration.
2. Have a 2.50 GPA in the major program of study.
3. Meet the standard for the exit examination of the student’s selected concentration(s).
4. Successful completion of the mid-program review, portfolio, and the written report.

Retention Standards for the BSOSEH Degree
To remain a student in good standing, the student must attain the following:
1. A cumulative GPA of 2.20 and a minimum of 2.50 in the major program of study.
2. Submit a portfolio of materials upon completion of 24 credits in the major for a mid-program evaluation of successful progress. Included in this portfolio will be a position paper relating to the goals, objectives, and responsibilities of the safety and health professional.
3. Upon completion of 35 credits of the major, a written report will be submitted that outlines the student’s philosophical position in relation to the student’s selected concentration within the Occupational Safety and Environmental Health major.

Students not achieving the GPA standard, or deemed to not be making satisfactory progress as a result of the mid-program review or not achieving a satisfactory review of the written report, will be placed on probation for one semester. At the conclusion of that semester, the student will be reevaluated and either returned as a student in good standing or dropped from the program. After two semesters, the student may apply for readmission to the major program of study.

Courses
226. Transportation Safety. 3 credits. An introductory course in transportation safety pertaining to personalized and fleet transportation systems. Emphasis will be on human characteristics related to driving, driving improvement, and state/national laws. F, S
305. Fire Safety. 2 credits. Prerequisite: Chem 122. Students will explore and familiarize themselves with those codes that are used to ensure fire-safe environments in structures of all types. The student will learn how to apply these codes to various structures, occupancies, and situations. F, S
325. Construction Safety. 3 credits. A study of the rules and regulations of construction. Emphasis will be focused on management techniques, program development, recordkeeping documentation, and training requirements of the construction industry. F, S
345. Emergency Response. 2 credits. Prerequisites: Anat 204 and PEXS 310. Emphasis will focus on the knowledge of regulatory requirements. Students will be versed in planning activities, the tools, protective equipment and emergency response procedures needed by those who respond to emergencies. Students will participate in laboratory. S
355. Inspections. 1 credit. Prerequisite: IT 440. Special consideration is given to the problems associated with interactions with management as related to regulatory matters. An awareness of the various rules and regulations which affect the workplace are part of the overview presented by this course. SS, F
d, S
365. Radiation. 2 credits. Prerequisite: Chem 122. Special emphasis is given to the problems associated with the proper and safe handling of Radioactive Materials in both the sealed and unsealed forms. Consideration is given to the regulatory requirements which might face a licensee. F, S
375. Asbestos. 2 credits. A study of asbestos, its characteristics, the rules and regulations regarding asbestos abatement, and the tools, protective equipment, and procedures utilized for asbestos abatement. S
385. Instrumentation. 2 credits. A study of the rules, regulations, requirements for the sampling analysis and monitoring of the business and industry workplace environment. Emphasis will be placed on the instrumentation, calibration and other techniques required for managing the process, developing a comprehensive program, record keeping requirements, documentation, and training requirements. F, S
395. Hazardous Materials Management. 3 credits. Prerequisite: Chem 122. Students will study the problems associated with proper, safe handling, and disposal of hazardous materials. Special consideration will be given to regulatory requirements, exposure limits, protective gear to be employed in response to hazards faced by employees who must handle these materials. Regulatory and environmental protection issues are addressed as they relate to current industry organizations to include the recognition, evaluation, control and disposal of hazardous materials as they relate to industry. F, S
405. Industrial Hygiene. 3 credits. Prerequisites: Anat 204, Chem 122. Hazards in the workplace as they relate to our health will be addressed. The course will include the recognition, evaluation, control of hazards as they relate to industry. F, S
425. Occupational Safety and Environmental Health Seminar. 3 credits. A study of emerging issues and concerns related to the Occupational Safety and Environmental Health profession. Involvement of practicing safety and health professionals and regulatory agency officials provide insight into the evolution of safety and health policies. S
435. Risk Management. 2 credits. The focus of this course will be on the global perspective of loss control measures and efforts in the minimization of financial insurance and workers compensation liabilities. F, S
440. Industrial Safety. 3 credits. Prerequisite: Upper Division Students only. 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. S

Occupational Therapy (OT)
See Graduate School section

Peace Studies (PS)
The Peace Studies courses listed below may be taken either as elective courses or as part of a Peace Studies program in Interdisciplinary Studies (IDS). For information on the major in Interdisciplinary Studies, see Interdisciplinary Studies listing and consult the Director of IDS in O’Kelly Hall, Room 129.

The Peace Studies courses are taught by faculty from the departments of philosophy and religion, history, education, economics, English, geography, 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 36 credits, including at least 23 credits as listed below (all but Independent Study are required). Other courses may be selected to focus on an area of interest, such as those from the Chinese Studies minor, or from the courses cross-listed under Peace Studies in the Schedule of Courses.

Courses

Unless otherwise noted, courses are PS
101. Introduction to Peace Studies. 3 credits. An introduction to the major content of the Peace Studies Program; problems of peace and war in the post-cold war age, alternative means of conflict resolution, a history of nonviolence as a moral and political philosophy, and a variety of social justice issues. F
Phil 215. Contemporary Moral Issues. 3 credits. An introduction to the problems connected with moral choice. This course examines the moral judgments that follow from the values held by a wide variety of people today on topics ranging from abortion to race, sexual behavior, the environment, etc. F
IDS 200. Learning Across Disciplines. 3 credits. 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 former 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 perspective — some technical material necessary to a reasonable and realistic understanding of the subject. S
360. Conflict Management. 3 credits. A survey of the nature, causes, and dynamics of conflict and of the ways that conflicts can be managed. Summer, or on demand through Psychology Department as Psyc 499. F
394. Independent Study. 1-4 credits (maximum of 6 credits). Prerequisite: consent of instructor. Supervised reading, study or research on an individual topic. On demand.
IDS 491. Capstone Interdisciplinary Seminar. 1-3 credits. F, S
497. Internship. 6-16 credits. Prerequisites: Junior standing and advisory approval. Provides direct experience in a peace-related, social change, human service/ human rights or international agency. F, S
Pharmacology, Physiology and Therapeutics (PPT)

Benoit, Brown-Borg, Combs, Doze, Geiger, Ghribi, Haselton, Lei, Murphy, Picklo, Porter, Rosenberger and Vari

The undergraduate mission of the Department of Pharmacology, Physiology and Therapeutics is to provide students majoring in Allied Health and Science programs with a basic foundation in pharmacology and physiology. Individual courses in pharmacology and physiology are required for various Allied Health and Science programs, the Athletic Trainers program, and the Chemical Use/Awareness Education course. Emphasis is placed on concept relevance in each of the courses to the students’ respective professional careers. While meeting each student’s academic program requirements, it also enhances each student’s opportunity to further their education in the health sciences at the graduate and professional level.

Educational objectives for individual pharmacology courses include the biological consequences of prescription and over-the-counter drugs, the mutual interactions of athletic performance and drug effects, and substances of abuse. Educational objectives for the physiology course cover general physiology from the level of molecules to the whole organism, with emphasis on the homeostatic mechanisms. The Department also fosters and encourages the participation of undergraduate students in ongoing faculty-directed research through an independent study option.

Courses
Undergraduate Courses

301. Human Physiology, 4 credits. Prerequisites: Anat 204 and either Bioi 150 and 150 lab or Chem 116 and 116 lab or Chem 121 and 121 lab. 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. F, S

315. Human Pharmacology, 3 credits. Prerequisites: PPT 301 and Chem 116 and 116 lab, or Chem 121 and 121 lab or Chem 122 and 122 lab. A survey of the more important drugs used in medicine, including basic principles, clinical uses and possible adverse effects. S

410. Drugs Subject to Abuse, 2 credits. Prerequisite: advanced undergraduate standing. Biochemical, pharmacological, behavioral and therapeutic aspects of substance abuse. S

492. Research in Pharmacology, Physiology and Therapeutics, 1-4 credits, repeatable up to a maximum of 6 credits. Prerequisite: consent of instructor. Laboratory research under faculty supervision. F, S, SS

499. Readings in Pharmacology, Physiology and Therapeutics, 1-4 credits. Prerequisites: consent of instructor. Topics and credits to be arranged with the instructor F, S, SS

Philosophy and Religion (Phil and Rels)

Baldwin, Lawrence, Lindholm, Miller (Chair), Poochigian 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. 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 General Education 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 (20 hours) in Philosophy and Religion 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 two programs of concentration:

1. B.A. in Philosophy and Religion: Philosophy Concentration
2. B.A. in Philosophy and Religion: Religion Concentration

College of Arts and Sciences

B.A. WITH A MAJOR IN PHILOSOPHY AND RELIGION: PHILOSOPHY CONCENTRATION

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

I. General Education Requirements (see University GER listing).
II. Philosophy Concentration requirements.

33 major hours, including:

Phil 101 ...... Introduction to Philosophy .............................................. (3)
Phil 220 ...... Introduction to Logic ...................................................... (3)
3 hours from:
Religion Curriculum

6 hours from:
Phil 301 ...... Ancient Philosophy ..................................................... (3)
Phil 302 ...... Medieval Philosophy ..................................................... (3)
Phil 316 ...... Renaissance and Enlightenment .................................. (3)
Phil 303 ...... Kant and the Nineteenth Century .................................. (3)
Others:
Philosophy Electives ........................................................................... (12)
Religion Course .................................................................................. (3)

6 hours from an open-ended list of diversity/multicultural courses, which will include, but not be limited to, the following: (for other possibilities, check with advisers in the department).

A&S 225 ...... Introduction to the Study of Women ................................ (3)
A&S 250 ...... African American Religious History ............................ (3)
Engl 365 ...... Black American Writers .............................................. (3)
Geog 151 ...... Human Geography ..................................................... (3)
Hist 354 ...... The Ancient Near East .................................................. (3)
IS 352 ...... Native American Philosophic Thought ............................. (3)
Phil 283 ...... Asian Philosophy ......................................................... (3)
Rel 203 ...... World Religions ............................................................ (3)
T&L 433 ...... Multicultural Education ................................................. (3)

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.

MINOR IN PHILOSOPHY AND RELIGION: PHILOSOPHY CONCENTRATION

Required 21 credits in Philosophy:
6 hours from:
Phil 283 ...... Asian Philosophy ......................................................... (3)
Phil 300 ...... Ancient Philosophy ....................................................... (3)
Phil 301 ...... Medieval Philosophy ..................................................... (3)

Minor in Philosophy
RELIGION CONCENTRATION
MINOR IN PHILOSOPHY AND RELIGION: RELIGION CONCENTRATION

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. General Education Requirements (see University GER listing).

II. Religion Concentration Requirements:

- 30 hours, including:
  -居

Courses in Philosophy

Since a major in philosophy involves a rigorous study of basic questions about human existence and actions, truth, and values, it is recognized as 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.

101. Introduction to Philosophy. 3 credits. An introductory survey of the discipline of philosophy. Students will join the thoughtful search, in which philosophers have engaged through reading and discussion since ancient days, into the problems of the natural and social sciences, of politics, and of everyday life. Students will study the basic concepts and theories of philosophy, and will also consider the role of philosophy in society and its relationship to other intellectual disciplines.

209. 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 life. Subjects may include questions about the morality of war, capital punishment, sexual behavior, welfare, and so forth. F, S

220. Introduction to Logic. 3 credits. A theoretical and practical introduction to the principles of reasoning—formal and informal, deductive and inductive. Students will study the laws and patterns of reasoning as vehicles for and obstacles to critical thinking. The central characteristics of deduction and validity; the role of hypotheses, inductive reasoning, probability estimates in scientific and quasi-scientific investigations and other models of critical thinking and their limits will be covered. F, S

283. Asian Philosophy. 3 credits. The main philosophical systems of India, China and Japan will be examined. F, S

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, S

302. 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

303. Kant and the Nineteenth Century. 3 credits. Philosophy from the “Age of Reason” through the Industrial Revolution as reflected in the writings of Kant and other philosophers such as Hegel, Mill, Marx, and Nietzsche. S, F

304. Twentieth Century Philosophy. 3 credits. Contemporary developments in philosophy since the beginning of the 20th century. S

309. American Philosophy. 3 credits. A survey of major figures and movements in American philosophy. F, S

325. 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, Descriptive Ethics (Kantianism), and dominant theories. Students are strongly advised to have taken PHIL 209 before enrolling in this course. S

335. Social and Political Philosophy. 3 credits. This course examines core issues in society and governance: the nature of justice, the limits of freedom, the role of religion, family and pluralism in the modern community, are a few examples of possible topics. Students in the course may examine both classical and contemporary theories of political society. F, S

350. Symbolic Logic. 3 credits. The modern deductive logic of propositions and functions (including relations); logical systems. Students majoring in mathematics or computer science will be especially welcomed in this course. S

353. Philosophy of Science. 3 credits. This course examines core issues in society and governance: the nature of justice, the limits of freedom, the role of religion, family and pluralism in the modern community, are a few examples of possible topics. Students in the course may examine both classical and contemporary theories of political society. F, S

356. 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. S, F

370. Ethics in Engineering and Science. 3 credits. Prerequisite: Junior/senior standing. This course centers on the ethical issues of particular concern to both citizens and professionals involved in engineering and related technical/scientific fields. We review ethical history and ethical theory in all class discussions. The major focus of the course, however, is on ethical dilemmas, case studies, and codes relevant to contemporary engineering and scientific practice. Issues surveyed include: ethical responsibility of theorists and of applied scientists, risk and negligence in technological enterprises, the limits of knowledge/safety/quality, an update of the two cultures debate. F, S

373. 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, S

399. Philosophic Themes. 1-3 credits. This course provides an opportunity for detailed examination of important philosophic topics. Topics will vary depending on faculty and student interests. Investigations into philosophy of religion, foundations of logic, African American philosophical schools, political correctness, and many others are possible. May be repeated for a maximum of 6 credits. On Demand.

409. Philosophy of Natural Science. 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. S

412. 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 the interpretation of precedent and statute within the common law tradition. Additional topics dealt with as time allows, encompass such issues as the justification of punishment and enforcement of morality. F

425. Metaphysics: 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 relativism, free will versus determinism. Although case studies and contemporary
Courses in Religion

Religion at the University is not studied with the assumption that one faith is true and the others are false. Rather, all religions are seen as creative, living systems of beliefs and practices that enable men and women around the globe to make sense of their lives. By studying, and to a limited degree projecting ourselves into, these belief systems, we are better able to appreciate the outlooks and values of other cultures and gain new insight into what gives meaning and worth to our lives. At the University religion is studied as the Supreme Court recommended in a 1963 opinion: “It might be said that one’s education is not complete without the study of comparative religion or the history of religion and its relationship to the advancement of civilization.”

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 postgraduate studies in law, medicine, and the ministry.

109. 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

101. Introduction to Religion (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

102. Introduction to Religion (East). 3 credits. A survey of the classical stories, rituals, and symbols of religious culture with an emphasis on the traditions of the Orient from ancient times to the present. S


203. World Religions. 3 credits. A general survey of the beliefs and practices of major world religions, with a focus on Islam, Hinduism, Buddhism, Taoism, and Native American traditions. S

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

221. Jewish Scripture/Old Testament. 3 credits. An introduction to the academic study of 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

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

228. Early Christian Traditions. 3 credits. A survey of Christian traditions, from their origins in Judaism and Greek philosophy; continuing through the growth of Christian doctrine in the 4th to 8th centuries; and concluding with the church in the Middle Ages. F


247. Introduction to 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. F/F

250. East and West in Religion. 3 credits. A critical and comparative study of people’s religious orientation between Eastern and Western traditions. F

280. 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

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

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 present day mystical phenomena. F

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.

315. Religion and Philosophy in China and Tibet. 3 credits. A survey of the major religions and philosophical systems of China and Tibet, from the bronze age through the Marxist-Leninist-Mao Zedong thought of the People’s Republic of China. S/F

320. Religion and Philosophy in India. 3 credits. A survey of the incredible range of beliefs and practices developed by the great religions and philosophical teachers of India. F/F

321. Prophets and Prophecy. 3 credits. This course investigates the religious phenomenon of prophecy in both traditional contexts (ancient Israeliite 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. S/F

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.

345. 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. F

380. Buddhism. 3 credits. A historical and critical survey of different Buddhist schools in India, China, Tibet, and Japan. S/F

399. Selected Topics. 1-3 credits. A selected topic in the area of religious studies such as Islam, Judaism, Religion and Public Life, Lessons of the Holocaust, Religion and the Environment, Greco-Roman Religion, African American Religious History, Women Religious Writers, F S

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. S/F

432. 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/2

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. S/F

466. Sex, Gender and Religion. 4 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. S/2

491. Seminar on Religion. 3 credits. Prerequisites: Junior or Senior standing and some upper level work in Religion or consent of the instructor. A consideration of selected topics or religious classics of mutual interest to departmental staff and advanced students in Religion. On Demand.

494. Independent Studies in Religion. 1-3 credits, may be repeated to 8 credits. Prerequisite: consent of the instructor. Supervised reading and study on an individual basis. S

The Department of Physical Education, Exercise Science and Wellness (PXW) believes that individuals and society benefit from physical education, exercise science and wellness.
physical activity. The mission of the Department is to promote enhanced quality of life through participation in physical activity, exercise, and sport for the people of North Dakota and beyond. Specifically, this mission is accomplished through: 1) the provision of quality teacher education and other professional preparation programs at both the undergraduate and graduate levels (see Kinesiology); 2) creative and scholarly activity which leads to discovery and dissemination of professional and disciplinary knowledge; and 3) contribution of professional expertise and talents as a service to the community, university and profession.

Graduates have the opportunity to pursue careers in physical education teaching, health, fitness and wellness education, leadership and management, athletic coaching, or to continue their education in graduate or professional studies.

Basic Instruction Courses — the Department of PXW 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, racket 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 PXW 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. There may also be fees assessed for certain specified activities.

Undergraduate programs offered by the Department of Physical Education, Exercise Science and Wellness in the College of Education and Human Development are:

A. Major in Physical Education, Exercise Science and Wellness: consists of a common core of courses with one of three options: teacher education option (Option A), which leads to a teacher certification to teach physical education in grades K-12; related area option (Option B), which allows a student to study physical education, exercise science and wellness and a related subdiscipline; and exercise science and wellness applications area option (Option C) for those students who wish to find employment in wellness/fitness fields or pursue graduate or professional studies.

B. Minor in Athletic Coaching: offered to students who wish to prepare for athletic coaching.

C. Minor in Health Education: provides partial preparation for school health teaching.

B.S.

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 College of Education and Human Development Requirements (see College listing).

III. Prerequisite courses, 19 credits, including: (courses may be used to satisfy the General Education requirements).

Chem 115/115L Introductory Chemistry and Laboratory* (4)
Psych 111 Introduction to Psychology* (3)
Soc 110 Introduction to Sociology* (3)
Anat 204/204L Anatomy for Paramedical Personnel and Laboratory (5)
PPT 301 Mechanics of Human Physiology (4)

IV. PXW core requirements, 30 credits including:

NUR 240 Fundamentals of Nutrition (3)
PXM 276/276L Motor Learning and Laboratory (3)
PXM 310 First Aid and CPR (2)
PXM 326 Fundamentals of Physical Conditioning (3)
PXM 332/332L Biomechanics and Laboratory (4)

PXW 355 Applied Motor Development (3)
PXM 401 Sport Sociology (3)
PXM 402/402L Exercise Physiology and Laboratory (4)
PXM 404 Adapted Activities Programming (2)
PXM 440 Sport Psychology (3)

V. One of the following options:

A. Teacher Education/Certification Option

Students seeking certification to teach physical education must be admitted to the Teacher Education program. Students must also complete the PXW core requirements (listed above) plus additional courses specific to the preparation for teaching in physical education, including the following courses:

PXW 205 Physical Education for the Elementary Grades (3)
PXM 220-238 Movement Performance and Analysis (3)
PXM 323 Introduction to Teaching in Physical Education and Sport Settings (3)
PXM 323L Introduction to Teaching in Physical Education and Sport Settings Laboratory (1)
PXM 400 Methods and Materials for Teaching Physical Education in the Secondary School (3)
PXM 400L Methods and Materials for Teaching Physical Education in the Secondary School Laboratory (1)
PXM 403 School Health Education (2)
PXM 406 Strategies for Teaching Physical Education in the Elementary School (3)
PXM 406L Strategies for Teaching Physical Education in the Elementary School Laboratory (1)
PXM 491 Senior Teaching Seminar (1)

Additional requirements for the teacher education/certification option include:

1. Admission to the Teacher Education program (see details in the UND Catalog under the College of Education and Human Development or on the Teacher Education website.)
2. Courses in the Department of Teaching and Learning: 330 or 325, 252, 345, and 433.
3. Teaching and Learning 390-Special Topic: Technology for Teachers (2 credits) or PXW 327-Fitness for Life (3 credits).
4. Satisfactory development of a teacher education portfolio at three points in the program (see the Department of Teaching and Learning for details).
5. Teaching and Learning 487-Student Teaching at both elementary and secondary levels (16 credits total; 8 credits each level).

B. Related Areas Option

PXW core requirements, plus the following:

1. Students will complete another major and/or minor in a subject area related to physical education, exercise science and wellness.
2. PXW 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 adviser.

C. Exercise Science and Wellness Applications Area Option

PXW core requirements, plus the following (for an additional minimum of 24 credits):

Electives:

PXW 207/207L Prevention and Care of Injuries and Laboratory (3)
PXM 240 Introduction to Wellness (2)
PXM 327 Fitness for Life (3)
PXM 375 Fundamentals of Group Exercise Instruction (3)
PXM 376 Professional Skills in Personal Training (3)
PXM 434 Strength Training: Coaching Methods (2)

MINOR IN ATHLETIC COACHING

Required 27 credits, including:

PXW 241 Introduction to Coaching (1)
PXM 207/207L Prevention and Care of Injuries and Laboratory (3)
PXM 220-238 Movement Performance and Analysis (3)
PXM 323 Introduction to Teaching in Physical Education and Sport Settings (3)
PXM 323L Introduction to Teaching in Physical Education and Sport Settings Laboratory (1)
PXM 325 Youth and Children in Sport (3)
PXM 326 Fundamentals of Physical Conditioning (3)
PXM 341 Organization and Administration of Athletics (2)
Physical Education, Exercise Science and Wellness Courses

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

105. Combinative 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

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

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

112. Outdoor Pursuits I. 1 credit. These courses are designed for beginners. They include 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

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

115. Target Sports I. 1 credit. These courses are designed for beginners. They include instruction in various target sports (e.g., trapshooting, skeet). For specific course content, see the current schedule of classes. F,S,SS

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

117. Gymnastics I. 1 credit. These courses are designed for beginners. They include instruction in various gymnastics (e.g., artistic, trampolining, tumbling, etc.). For specific course content, see the current schedule of classes. F,S,SS

118. Military Conditioning I. 1 credit. This course is designed for beginners. It includes instruction in military conditioning. F,S,SS

119. Sports Officiating I. 1 credit. Knowledge of the rules and techniques for officiating various sports. Offered by sport; credit is repeatable by sport. On Demand.

124. Aquatics II. 1 credit. Prerequisite: PXW 104 in the same activity or consent of the instructor. These courses provide advanced level instruction in various aquatic-related activities (e.g., swimming, diving, etc.). For specific course content, see the current schedule of classes. F,S,SS

125. Combinative Sports II. 1 credit. Prerequisite: PXW 105 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

127. Dance II. 1 credit. Prerequisite: PXW 107 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

132. Outdoor Pursuits II. 1 credit. Prerequisite: PXW 112 in the same activity or consent of the instructor. These courses provide advanced level instruction in various outdoor pursuit activities (e.g., camping, cycling, cross-country skiing, etc.). For specific course content, see the current schedule of classes. F,S,SS

135. Target Sports II. 1 credit. Prerequisite: PXW 115 in the same activity or consent of the instructor. These courses provide advanced level instruction in various target sports (e.g., trapshooting, skeet). For specific course content, see the current schedule of classes. F,S,SS

136. Team Sports II. 1 credit. Prerequisite: PXW 116 in the same activity or consent of the instructor. These courses provide advanced level instruction in various team sports (e.g., baseball, basketball, football, ice hockey, soccer, volleyball, etc.). For specific course content, see the current schedule of classes. F,S,SS

137. Dance III. 1 credit. Prerequisite: PXW 127 in the same activity or consent of the instructor. These courses provide advanced level instruction in various dance types (e.g., ballet, hip-hop, etc.). For specific course content, see the current schedule of classes. F,S,SS

144. Aquatics III. 1 credit. Prerequisite: PXW 124 in the same activity or consent of the instructor. These courses provide advanced level instruction in various aquatic-related activities (e.g., swimming, diving, etc.). For specific course content, see the current schedule of classes. F,S,SS

145. Combinative Sports III. 1 credit. Prerequisite: PXW 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

147. Dance III. 1 credit. Prerequisite: PXW 127 in the same activity or consent of the instructor. These courses provide advanced level instruction in various dance types (e.g., ballet, hip-hop, etc.). For specific course content, see the current schedule of classes. F,S,SS

148. Fitness and Conditioning III. 1 credit. Prerequisite: PXW 126 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

151. Individual Sports / Activities III. 1 credit. Prerequisite: PXW 131 in the same activity or consent of the instructor. These courses provide advanced level instruction in various individual sport 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

152. Outdoor Pursuits III. 1 credit. Prerequisite: PXW 132 in the same activity or consent of the instructor. These courses provide advanced level instruction in various outdoor pursuit activities (e.g., camping, cycling, cross-country skiing, etc.). For specific course content, see the current schedule of classes. F,S,SS

153. Racquet Sports III. 1 credit. Prerequisite: PXW 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

155. Target Sports III. 1 credit. Prerequisite: PXW 135 in the same activity or consent of the instructor. These courses provide advanced level instruction in various target sports (e.g., trapshooting, skeet). For specific course content, see the current schedule of classes. F,S,SS

159. Sports Officiating II. 1 credit. Knowledge of the rules and techniques for officiating various sports. Offered by sport; credit is repeatable by sport. On Demand.
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156. Team Sports III. 1 credit. Prerequisite: PXW 136 in the same activity or consent of the instructor. These courses provide advanced level instruction in various team sports (e.g., baseball, basketball, football, ice hockey, soccer, volleyball, etc.). For specific course content, see the current schedule of classes. F.S.S.S

157. Gymnastics III. 1 credit. Prerequisite: PXW 137 in the same activity or consent of the instructor. These courses provide advanced level instruction in various gymnastics (e.g., artistic, trampolining, tumbling, etc.). For specific course content, see the current schedule of classes. F.S.S.S

158. Military Conditioning III. 1 credit. Prerequisite: PXW 138 in the same activity or consent of the instructor. This course provides advanced level instruction in military conditioning. F.S.S.S

205. Physical Education for the Elementary Grades. 3 credits. A study of contemporary programs in elementary physical education. Emphasis on appropriate movement and physical education skills for young children. On demand. F.S.S.

206. Workshop. 1 credit. Each workshop will emphasize an area related to PXW. Course may be repeated as long as content varies. For specific course content, see the current schedule of classes. On demand.

207. Prevention and Care of Injuries. 3 credits. An overview of the scope of athletic training with emphasis on injury management and preventative measures. F.S.

224. Aquatics: 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 PWX 220-239 series. Prerequisite: matching PXW 104, 124, 144, or performance equivalent in same area. These courses focus on the development of performance, performance analysis and knowledge in various aquatics-related activities (e.g., swimming, diving, etc.). These are professional preparation courses for PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

225. Combative 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 PWX 220-239 series. Prerequisite: matching PXW 107, 127, 147, 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 PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

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 PWX 220-239 series. Prerequisite: matching PXW 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 PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

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 PWX 220-239 series. Prerequisite: matching PXW 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., badminton, back and field events, etc.). These are professional preparation courses for PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

232. Outdoor Pursuits: 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 PWX 220-239 series. Prerequisite: matching PXW 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 PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

233. Racquet 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 PWX 220-239 series. Prerequisite: matching PXW 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 PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

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 PWX 220-239 series. Prerequisite: matching PXW 114, 134, 154, or performance equivalent in same area. These courses focus on the development of performance, performance analysis and knowledge in various strength training activities (e.g., body building, power lifting, weight training, etc.). These are professional preparation courses for PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

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 PWX 220-239 series. Prerequisite: matching PXW 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). These are professional preparation courses for PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

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 PWX 220-239 series. Prerequisite: matching PXW 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 PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

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 PWX 220-239 series. Prerequisite: matching PXW 117, 137, 157, or performance equivalent in same area. These courses focus on the development of performance, performance analysis and knowledge in various gymnastics (e.g., artistic, trampolining, tumbling, etc.). These are professional preparation courses for PXW majors. For specific course content, see the current schedule of classes. F.S.S.S

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 multi-dimensional aspects of wellness and the pivotal role that each dimension plays in personal self fulfillment. F.S.

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.S.S

276. Motor Learning, 3 credits. Corequisite: PXW 276L. Prerequisite: PXW majors only or consent of the instructor. Consideration of various factors which may affect learning and performance in human movement activities. S

299. Special Topics. 1-4 credits, repeatable to 9. Specialized topics related to physical education, exercise science and wellness. On demand.

307. Health/Physical Education for Early Childhood and Elementary Education Teachers. 3 credits. Prerequisite: PXW 120L or consent to Teacher Education. Early Childhood Education or Elementary Education major. 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. F.S.S.S

309. Water Safety Instruction. 2 credits. Prerequisite: Current Senior Lifesaving Certificate. Scientific movement principles, theories and techniques as they apply to swimming teaching and conduct of aquatic activities. Laboratory teaching assignments. On demand.

310. First Aid and CPR. 2 credits. Recommended Advanced First Aid and CPR practices for the care of persons who have been injured or suddenly become ill. F.S.

321L. Introduction to Teaching in Physical Education and Sport Settings Laboratory. 1 credit. Prerequisite: PXW 220-239 series requirements. Corequisite: PXW 321L. 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. On demand.

323L. Introduction to Teaching in Physical Education and Sport Settings Laboratory. 1 credit. Prerequisite: PXW 220-239 series requirements. Corequisite: PXW 323. Supervised experiences in laboratory and field settings for the purpose of developing teaching skills for physical education and sport settings. Prerequisite: PXW 220-239 series. On demand.

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.S.

326. Fundamentals of Physical Conditioning. 3 credits. Prerequisite: PXW majors only or consent of the instructor. A study of the basic knowledge, principles, and methods of physical conditioning for health, fitness and wellness benefits, and for athletic performance improvement. F.S.

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.

332. Biomechanics, 4 credits. Prerequisite: PXW majors only or consent of the instructor, Anat 204, 204L. The study of human movement with special emphasis on those movements related to sport and physical activity. F.S.

341. Organization and Administration of Athletics. 2 credits. Principles and practices for management of the interscholastic athletic program. S

355. Applied Motor Development. 3 credits. Prerequisite: PXW majors only or consent of the instructor. Changes in motor performance which occur with age; physical and mental development as they relate to these changes. F.S.

375. Fundamentals of Group Exercise Instruction. 3 credits. Prerequisite: PXW 326. Fundamental knowledge and practical skills needed to lead a group exercise class. On demand.

376. Professional Skills in Personal Training. 3 credits. Prerequisite: PXW 326. The fundamental knowledge and skills necessary to provide personal training for individuals and/or small groups of people. On demand.

397. Cooperative Education. 1-4 credits, repeatable to 16. Prerequisite: PXW majors only. Part of the educational system where PXW majors can earn academic credit for career work done in their field of study. Arranged by mutual agreement among student, department and employer. S/U grading only. F.S.

400. Methods and Materials for Teaching Physical Education in the Secondary School. 3 credits. Prerequisite: PXW 400L and admission to Teacher Education. Corequisite: PXW 400L. Instructional skills and curriculum analysis for secondary school physical education. On demand.

400L. Methods and Materials for Teaching Physical Education in the Secondary School—Laboratory. 1 credit. Prerequisite: PXW 400L, and admission to Teacher Education.

401. Sport Sociology. 3 credits. Prerequisite: PXW majors only or consent of the instructor; Soc 110. The critical exploration of the function of sports in American culture, in a sociocultural context, with a focus on the contemporary social milieu.

402. Exercise Physiology. 4 credits. Prerequisite: PXW majors only or consent of the instructor; PPT 301 (or Human Physiology equivalent). The acute and chronic effect of the type, intensity and duration of exercise on physiological functions. F

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. S

404. Adapted Activities Programming. 2 credits. Prerequisite: PXW majors only or consent of the instructor. Information about specific handicaps and adaptations of various activities that individuals may participate in. S

406. Strategies for Teaching Physical Education in the Elementary School. 3 credits. Prerequisites: 205, 323, and admission to Teacher Education. Corequisite: PXW 406L. The development of skills and knowledge related to teaching physical education to young children. On demand.

406L. Strategies for Teaching Physical Education in the Elementary School—Laboratory. 1 credit. Prerequisites: PXW 323L, 205, and admission to Teacher Education. Corequisite: PXW 406. Supervised experiences in the elementary school for the purpose of developing teaching skills for physical education and sport settings. On demand.

424. Aquatics: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 224 in the same area. These courses focus on methods employed in coaching specific aquatic-related activities (e.g., swimming, diving, etc.). For specific course content, see the current schedule of classes. F,SS

425. Combative Sports: Coaching Methods. 2 credits, repeatable with different sports to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 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,SS

427. Dance: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 227 in the same area. These courses focus on methods employed in teaching specific dance types (e.g., ballet, hip-hop, etc.). For specific course content, see the current schedule of classes. F,SS

428. Fitness and Conditioning: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 228 in the same area. These courses focus on methods employed in instructing various fitness and conditioning activities (e.g., aerobic exercise, pilates, yoga, etc.). For specific course content, see the current schedule of classes. F,SS

431. Individual Sports/Activities: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 231 in the same area. These courses focus on methods employed in coaching specific individual sport and activities (e.g., golf, ice skating, track and field events, etc.). For specific course content, see the current schedule of classes. F,SS

432. Outdoor Pursuits: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 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,SS

433. Racquet Sports: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 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,SS

434. Strength Training: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 234 in the same area. These courses focus on methods employed in coaching specific strength training techniques (e.g., body building, weightlifting, etc.). For specific course content, see the current schedule of classes. F,SS

435. Target Sports: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 235 in the same area. These courses focus on methods employed in coaching specific target sports (e.g., trapshooting, skeet). For specific course content, see the current schedule of classes. F,SS

436. Team Sports: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 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,SS

437. Gymnastics: Coaching Methods. 2 credits, repeatable with different spots to a maximum of 10 credits in the PXW 420-439 series. Prerequisite: matching PXW 237 in the same area. These courses focus on methods employed in coaching specific types of gymnastics (e.g., artistic, trampolining, tumbling, etc.). For specific course content, see the current schedule of classes. F,SS

440. Sport Psychology. 3 credits. Prerequisite: PXW majors only or consent of the instructor: Psych 111. Examination of psychological constructs influencing the competitive sport process and physical activity. S

446. Exercise Testing and Prescription. 3 credits. Prerequisites: PXW 326 and 402. Theory and practice of administering exercise, fitness and wellness tests, and using the results in exercise prescription and programming. On demand.

491. Senior Teaching Seminar. 1 credit. Corequisite: T&L 487. A critical analysis of problems, professional obligations and careers in teaching physical education. FS

494. Directed Studies/Research. 1-4 credits. Prerequisite: Consent of the instructor. An in-depth study or participation in a research project in a subject area selected by the student under faculty supervision. F,SS

495. Service Learning. 2 credits. Prerequisites: required coursework from PXW 220-239 series. Independent and group study of professional placement and leadership in physical education, exercise science and wellness settings. Practical experiences in these settings within the community. Includes lectures, site visits, and fieldwork hours. F,SS

496. Field Study. 1-8 credits. Prerequisite: Consent of instructor and upper division status. Placement of student in a practical setting under university faculty supervision. F,SS

497. Internship. 4-12 credits. Prerequisite: PXW majors only. Provides practical experience for new PXW majors by working directly with established fitness/wellness, health and human service organizations under the supervision of professionals and faculty. Credits are taken in one semester for paid or volunteer part-time work. S, U grading only. F,SS

498. Practicum in Coaching. 2 credits. Prerequisites: PXW 420-439 in the assigned sport in which the student will coach. Supervised experiences in a school setting for the purpose of developing skills and techniques for coaching. F,SS

499. Special Topics. 1 to 4 credits. Prerequisite: PXW majors only, or consent of instructor. Investigation of special topics in the study of physical education, exercise science and wellness not included in current departmental course offerings. F,SS

Physical Therapy (PT)

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 UND-PT to keep informed of the pre-professional and professional curriculum. Our web site is www.medicine.nodak.edu/pt.

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.

Pre-Physical Therapy Requirements

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 prephysical 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. Counts 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 credits from upper level courses (i.e., 300 and 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 Introductory Sociology .................................................. (3 cr.)
One semester of a Public Speaking course .............................................. (3 cr.)
Two semesters of English Composition ..................................................... (6 cr.)
Arts and Humanities coursework * ............................................................ (9 cr.)
* one course should fulfill the World Culture requirement.

See Physical Therapy in the Graduate Section.

Physics
(Phys)
Chen, Dewar (Chair), Kim, Lykken, Marasinghe, Moreno, Schwalm and Young

The Department of Physics offers a major and 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

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:

Phys 251 ................... University Physics I/Laboratory ........................................... (4 cr.)
Phys 252 ................... University Physics II/Laboratory ......................................... (4 cr.)
Phys 253 ................... University Physics III/Laboratory ........................................... (4 cr.)
Phys 317, 318 ................ Mechanics I, II .......................................................... (6 cr.)
Phys 324 ................. Thermophysical Processes ............................................. (3 cr.)
Phys 325 ................... Optics ........................................................................ (3 cr.)
Phys 325L ................... Optics Laboratory .......................................................... (1 cr.)
Phys 327, 328 .............. Electrical and Magnetism I, II ........................................... (6 cr.)
Phys 415 ................... Research Experience ....................................................... (3 cr.)
Phys 428 ................... Advanced Physics Laboratory ........................................... (2 cr.)
Phys 431, 432 .............. Quantum Mechanics I, II ............................................... (6 cr.)
Chem 121, 122 ............. General Chemistry I, II .................................................. (6 cr.)
Chem 121L, 122L .......... Laboratory Corequisites .................................................. (2 cr.)
Math 165, 166, 265 ...... Calculus I, II, III .............................................................. (8 cr.)
Math 266 ................... Elementary Differential Equations ..................................... (3 cr.)
Math 352 ................... Partial Differential Equations ............................................. (3 cr.)
Math 327 ................... Applied Linear Algebra ..................................................... (3 cr.)

To provide proper advisement, the Physics Department 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 Special Problems, Physics 492.

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:

EE 206 ............... Circuit Analysis ................................................................. (3 cr.)
EE 321 ............... Electronics I ................................................................. (3 cr.)
EE 308 ............... Electronics Lab ........................................................... (2 cr.)
Phys 402 .......... Computers in Physics ....................................................... (3 cr.)
EE 452L ............... Microprocessors ......................................................... (3 cr.)

In addition, students electing the applied physics track should select an instrumentation project as a means of satisfying the research core requirement, Phys 415.

III. Astrophysics track: This option is for students with special interest in astronomy, astrophysics, space exploration or aerospace applications. The following are required.

Phys 110 .......... Intro. Astronomy ............................................................... (3 cr.)
Phys 110L .......... Intro. Astronomy Lab ...................................................... (1 cr.)
Phys 434 .......... Nuclear Physics ............................................................... (3 cr.)
Phys 460 .......... Intro. Astrophysics I ........................................................... (3 cr.)
Phys 461 .......... Intro. Astrophysics II ........................................................ (3 cr.)

To satisfy the research requirement, Phys 415, 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.

CSCI 160 ...... Computer Sci. I ................................................................. (4 cr.)
CSCI 161 ...... Computer Sci. II ................................................................. (4 cr.)
Phys 402 ........ Computers in Phys. ........................................................... (3 cr.)

For the Computers in Physics track, students should seek out computational research projects for Phys 415, or laboratory projects involving computer instrumentation.

V. Materials Science track: This option provides the strongest foundation in solid state and materials science. Required are:

1. Phys 320 ......... Intro. Materials Sci. ........................................................... (3 cr.)
2. Phys 420 ......... Topics in Materials ........................................................ (3 cr.)
3. Phys 437 .......... Solid State Phys ............................................................. (3 cr.)

Students in this track should select approved research projects in materials science as a means of satisfying the Phys 415 requirement.

MINOR IN PHYSICS

Required 20 credits in Physics. The specific courses should be chosen in consultation with the department.

Courses

110/110L. Introductory Astronomy, 3 credits/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 for 1 credit. F,S

130/130L. Natural Science—Physics, 4 credits. Corequisite: 130L for 130. For non-science majors, this is a hands-on, inquiry-based course on the workings of science. Emphasis is on critical thinking and the use of the scientific method. Topics will include: electricity, force, motion, and energy. The laboratory is a corequisite of this course. S

140. Physics for Poets, 3 credits. An introduction to the fundamental concepts of physics, especially those developed in the twentieth century. A knowledge of elementary algebra is recommended, but the course is designed for students with a limited mathematical background. No laboratory. On demand.

150. Physics for Aerospace Sciences, 4 credits. Corequisite: Phys 150L. An introduction to the principles and concepts of physics as they apply to the study of aerospace sciences. Topics: Newtonian mechanics, gravitation, work, energy, fluids, electricity, magnetism. F,S

150L. Physics for Aerospace Sciences Laboratory, 1 credit. Corequisite: Phys 150.

161/161L, 162/162L. Introductory College Physics I & II. 8 credits. Corequisites: 161L for 161; 162L for 162. An introduction to the principles and concepts of physics with the application of minimal mathematics, sufficient to show the logical progression from one topic to the next. General physics for those who do not plan to take an advanced course in science. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, vibrations and waves, electricity and magnetism, light and optics. The laboratory is a corequisite of each course. Physics 161 has no mathematical prerequisite but knowledge of elementary algebra is recommended. Physics 161 is offered in the fall and Physics 162 in the spring. F,S

211/211L. College Physics I/Laboratory, 4 credits. Prerequisite: Math 103. This non-calculus general physics course is recommended for pre-medical or pre-professionals. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, heat and thermodynamics. The laboratory is a corequisite for this course. A
student may not receive credit for Physics 211, 211L, Physics 212, 212L and also Physics 161, 161L, and Physics 162, 162L. F

212/212L. College Physics II/Laboratory. 4 credits. Prerequisite: Physics 211. The non-calculus general physics course sequence recommended for pre-medical or pre-professional students. Topics: vibrations and waves, electricity and magnetism, light and optics, and an introduction to modern physics. The laboratory is a corequisite for this course. A student may not receive credit for Physics 211, 211L, Physics 212, 212L and also Physics 161, 161L, and Physics 162, 162L. S

213/213L. College Physics III/Laboratory. 4 credits. Prerequisite: Physics 212. A survey of modern physics with emphasis on topics of major importance to contemporary science and engineering. Topics normally covered in this course will include: quantum mechanics, special relativity, Newtonian mechanics, 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 corequisite for Phys 251. F/2

252/252L. University Physics II/Laboratory. 4 credits. Prerequisite: Math 166, Physics 251 and 251L. Corequisite: Physics 252L. Topics normally covered include electricity, magnetism, electromagnetic waves, light, and geometrical optics. The laboratory is a corequisite for Phys 252. F/2

253/253L. University Physics III/Laboratory. 4 credits. Prerequisites: Math 265, Physics 252 and 252L. Corequisite: Physics 253L. Modern physics, a survey covering topics of major importance to contemporary science and technology. 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 many advanced physics courses. The laboratory is a corequisite for Phys 253. F/S

294. Selected Topics in Physics. 1 credit. Prerequisite: 8 hours of College Physics or consent of instructor. May be repeated to a maximum of 4 hours. Credit may not be applied toward a major in physics. On demand.

317. Mechanics I. 3 credits. Prerequisites: Physics 251 and Math 266, or approval of department. Motion of a single particle, central forces and simple oscillatory systems. F/2

318. Mechanics II. 3 credits. Prerequisite: Physics 317 or approval of instructor. A continuation of Physics 317. Rigid body motion, Lagrangian and Hamiltonian dynamics, relativistic, continuum mechanics. S/2

320. Introductory Materials Science. 3 credits. Prerequisite: Physics 253 or approval of department. An introduction to solid state physics with emphasis on applications. F/S

324. Thermal Physics. 3 credits. Prerequisite: Physics 253 or approval of instructor. Thermodynamics with an introduction to statistical physics. S/2

325. Optics. 3 credits. Prerequisites: Physics 253 or approval of department. Geometrical and physical optics with an emphasis on optical systems. S/2

325L. Optics Laboratory. 1 credit. Corequisite: Physics 325. Laboratory to accompany Physics 325. S/2

327. Electricity and Magnetism I. 3 credits. Prerequisites: Physics 253 or approval of instructor. A quantitative treatment of electro-magnetic theory with an introduction to Maxwell’s equations. F/2


402. Computers in Physics. 3 credits. Prerequisites: Physics 252 and knowledge of a higher-level computer programming language, or consent of instructor. Computer applications in physics, that may include data analysis, numerical simulation, symbolic and algebraic programming, parallel computing, computer interfacing and/or experimental physics applications. S/2

415. Research Experience. 3 credits. Prerequisite: Physics 253 or advisor’s consent. The students will engage in research activities in a UNH physics faculty member or may take part in a physics department approved external research program such as an NSF-funded REU program. F

420. Advanced Topics in Materials Science. 3 credits. Prerequisite: Physics 320. A discussion on the applications of physics to design, synthesis and characterization of materials of current interest. F

428. Advanced Physics Laboratory. 2 credits. Prerequisite: Physics 253 or approval of instructor. Advanced undergraduate experiments in physics, using modern techniques and instrumentation. Classic experiments leading to the current understanding of physical theory. F/2

431. Quantum Mechanics I. 3 credits. Prerequisite: Physics 253 and 317 or approval of department. Corequisite: 317. An introduction to quantum mechanics with applications to atomic structure. F/2

432. Quantum Mechanics II. 3 credits. Prerequisite: Physics 431 or consent of instructor. Further development of basic quantum theory with application to atomic, molecular, solid state and nuclear physics. S/2

434. Nuclear Physics. 3 credits. Prerequisite: Physics 253 or approval of instructor. Introduction to the theory of atomic nuclei, fundamental forces and sub-atomic particles. F/2.

437. Introduction to Solid State Physics. 3 credits. Prerequisite: Physics 253 or approval of instructor. A general introduction to solid state phenomena. F/2

460. Introduction to Astrophysics. 3 credits. Prerequisite: Physics 253 or consent of instructor. 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. F/2

461. Introduction to Astrophysics II. 3 credits. Prerequisite: Physics 460 or approval of instructor. 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. S/2

492. Special Problems. 1-3 credits. Prerequisite: approval of the department. F, S

499. Senior Honors. 1-15 honors

Political Science (Pols)

Harsell, Hultquist, Jendrysik (Chair), Jensen, Light, Scheurer, Sum, Urlacher and Wood

The Department of Political Science and Public Administration offers undergraduate programs leading to the Bachelor of Arts with a major or minor in Political Science and to the Bachelor of Science in Public Administration or a minor in Public Administration. The B.A. is offered through the College of Arts and Sciences and the B.S.P.A. through the College of Business and Public Administration. (See Public Administration listed separately in this catalog.) The undergraduate Political Science program is designed to provide students with a broad background in the liberal arts. The Public Administration program also has a core of liberal arts courses combined with courses from the administrative sciences. The communication and analytical skills emphasized in both programs 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 Graduate School leading to the Masters of Public Administration. Some students may qualify for a 5-year undergraduate Political Science/Master of Public Administration (MPA) program. See the Graduate section for admission criteria.

College of Arts and Public Science

B.A. WITH MAJOR 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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

37 major hours, including:

Pols 115 American Government I ................................................. (3)
Pols 116 State and Local Government ............................................. (3)
Pols 220 International Politics .......................................................... (3)
Pols 225 Comparative Politics .......................................................... (3)
Pols 250 Politics of Public Administration ........................................... (3)
Pols 310 Introduction to Political Thought ......................................... (3)
Pols 405 Political Behavior ............................................................... (3)
Pols 432 Public Policy Making Process ............................................ (3)
Pols 495 Senior Colloquium ............................................................ (1)
Pols ..................... Electives ................................................................. (9)

Required in other departments:

Level II proficiency in a foreign language

Economics 210, Introduction to Business and Economic Statistics or equivalent (3 credits)

Economics 202, Introduction to Macroeconomics (3 credits)

MINOR IN POLITICAL SCIENCE

Required 21 credits, including:

Pols 115 American Government I ................................................. (3)

Select 6 hours from:

Pols 220 International Politics .......................................................... (3)
Pols 225 Comparative Politics .......................................................... (3)
Pols 250 Politics of Public Administration ........................................... (3)

Select 6 credits from:

Pols 300 Research Methods ........................................................... (3)
Courses

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

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

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

225. Comparative Politics. 3 credits. An introduction to comparative politics with emphasis on the democratic systems of Europe. F

250. Politics of Public Administration. 3 credits. Prerequisite: Pols 115. 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. F

300. Introduction to Research Methods. 3 credits. General consideration of research methods and data analysis in political science and the social sciences. F

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

306. American Constitution — Civil Liberties. 3 credits. Prerequisite: Pols 115. Analyzes U.S. Supreme Court decisions and interpretations which focus on civil liberties; equal protections, due process, First Amendment rights. S

308. Intergovernmental Relations. 3 credits. Analyzes the growing interrelationship of federal, state and local governments with emphasis on financial aspects. F/2

309. The Legislative and Executive Processes. 3 credits. A survey of the organization, functions and interaction of the American legislative and executive branches of government. S

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

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

320. Foreign Policies. 3 credits. Examination of the role of major powers in the international system, with emphasis on the foreign policies of the United States and other major powers. S

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. F/2

323. Issues in Comparative Politics. 3 credits, repeatable to 6. Examination of contemporary issues in comparative politics with particular emphasis on the dynamics of change in political systems. F

361. Nonprofit Management. 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/2

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. F/S

397. Cooperative Education. 1-3 credits. Repeatable to 6 credits. Prerequisite: 3.00 GPA; 12 hours in Pols; course related to cooperative experience; permission of department. Compensated on the job-experience in various areas of political science. S-U grading only. F/S

404. Urban Politics and Administration. 3 credits. Prerequisite: Pols 115. Analysis of the socio-economic context of urban America and its impact on politics, policy, and administration. S

405. Political Behavior. 3 credits. Prerequisite: Pols 115. 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. F

432. Public Policy Making Process. 3 credits. Prerequisite: Pols 115. 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. S

433. The Administrator and Public Affairs. 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. S

437. Administrative Processes. 3 credits. Prerequisite: Pols 250. Explanation of theoretical and practical aspects of personnel and financial management in the public sector. S

480. Administrative Internship. 1-3 credits. Prerequisites: 3.00 GPA; 12 hours in Pols; course related to internship experience; permission of department. 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. S/U grading only. F/S

491. Readings in Political Science. 1-3 credits. Prerequisites: 3.00 GPA; 12 hours in Pols; course related to readings; permission of department. Selected readings with oral and written reports. Consent of instructor required prior to enrollment. F/S

493. Professional Project in Public Administration. 3 credits. Prerequisite: Senior standing. A capstone course in Public Administration 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. This course is designed for Public Administration majors only. S

495. Senior Colloquium. 1 credit. Prerequisite: Senior standing. 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. S

497. Senior Tutorial. 2 credits. Prerequisite: Senior or consent of instructor. Corequisites: Pols 432 and Pols 495. A course which requires mentoring introductory students in Political Science. Further, students will undertake supervised research culminating in a major paper. This course is designed for majors only. S

Psychology (Psyc)

Antes, Bradley, Derenne, Ferraro, Grabe, Himle, Holm, King, McDonald, Miller, Muehlenkamp, Peters, Petros, Ruthig, Terrance, Weatherly (Chair) 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. In addition, students who major in psychology may choose to complete an emphasis, or area of focus within psychology. The emphases are described after the listing of the core curriculum requirements.

B.A. OR 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. General Education Requirements (see University GER listing).

II. The Following Curriculum:

36 major hours, including:

Psyc 111 ............ Introduction to Psychology ............................................. (3)
Psyc 120 ............ Orientation to the Major ............................................. (1)
Psyc 241 ............ Introduction to Statistics ............................................. (4)
Psyc 303 ............ Research Methods in Psychology ................................. (4)
Psyc 405 ............ History and Systems of Psychology ............................... (3)

One course from Area A:
Psyc 433 ............ Psychology of Learning ............................................. (4)
Psyc 434 ............ Motivation and Emotion ............................................. (4)
Psyc 435 ............ Physiological Psychology ........................................... (4)
Psyc 436 ............ Perception ................................................................. (4)
Psyc 437 ............ Psychophysiology ....................................................... (4)
Psyc 439 ............ Cognitive Psychology ................................................. (4)

One course from Area B:
Psyc 421 ............ Diversity Psychology ................................................... (3)
Psyc 451 ............ Advanced Developmental Psychology .......................... (3)
Psyc 460 ............ Advanced Social Psychology ...................................... (3)
Psyc 470 ............ Introduction to Clinical Psychology ............................... (3)

*Psyc 111 is prerequisite to all other psychology classes.

Required in other departments:
Level II proficiency in a foreign language, or equivalent proficiency in 8 credits of American Sign Language

Math 103 ............ College Algebra ............................................................. (3)

One of the following combinations:
Biol 111/111L .... Concepts of Biology with Laboratory &
Biol 150/150L,... General Biology I with Laboratory .................................(8) or Biol 150/150L,... General Biology I with Laboratory & Biol 151/151L,... General Biology II with Laboratory .................................(8) or Biol 150/150L,... General Biology I with Laboratory & Anat 204/204L,... Anatomy for Paramedical Personnel with Laboratory .........(9) or Biol 211/111L,... Concepts of Biology with Laboratory & Anat 204/204L,... Anatomy for Paramedical Personnel with Laboratory .........(9) Additional requirements for B.A.: Level IV proficiency in a foreign language OR 8 additional hours of Arts and Humanities beyond those used for other requirements. Additional requirements for B.S.: Eight additional hours from the following list, beyond those utilized for other requirements: Any classes from the anatomy, biology, chemistry, geology, mathematics, or physics departments. Any class listed under the Area IV general education requirements from the following departments: atmospheric sciences, anthropology, geography nutrition and dietetics, honors, or space studies. MINOR IN PSYCHOLOGY Required 20 credits, including: Psyc 111 ........ Introduction to Psychology .............................................(3) Psyc 250 ........ Developmental Psychology .............................................(4) Psyc 270 ........ Abnormal Psychology ....................................................(3) Students receiving teaching certification in secondary education (except CSD) must also include: Psyc 241 ........ Introduction to Statistics .............................................(4) Psyc 303 ........ Research Methods in Psychology ...................................(4) OPTIONAL EMPHASIS Although no student majoring in psychology is required to complete an emphasis, students may choose to do so in order to gain greater background in their areas of interest in the field of psychology. There are five emphases that students may select from: Educational Psychology; Psychology of Human Development; Biological and Physiological Psychology; Social and Cultural Psychology; and Clinical Science. Students are encouraged to contact the department or the department’s web site for a description of each emphasis. In order to complete an emphasis, a student must pass at least four of the courses listed. Courses taken in the core curriculum may count toward completion of an emphasis. Students may complete more than one emphasis and courses listed under more than one emphasis may be counted toward completion of multiple emphases. Students wishing to receive a certificate in one or more emphases must apply with the Psychology Department no later than the deadline for applying to graduate and no earlier than the start of the semester of their intended graduation. Students with declared emphases will receive a certificate from the Psychology Department following their graduation. Courses

Psychology 111 is the prerequisite for all other Psychology courses.

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

120. Orientation to the Major, 1 credit. An introduction to careers available to students majoring in psychology and the coursework and other experiences valuable in pursuing those careers. F, S

213. Educational Psychology, 3 credits. Human development; perceptual processes; learning; the home, the school and personality; psychology of school subjects; evaluation of pupils. F, S

241. Introduction to Statistics, 4 credits. Prerequisite: Math 103 or 104. Descriptive and inferential statistics as applied to psychological measurement and experimentation. F, S

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. F, S

270. Abnormal Psychology, 3 credits. A survey of the classification, symptoms, and etiology of psychological disorders and behavior pathology. F, S

294. Individual Research, 1-4 credits, repeatable to 4. Prerequisite: Consent of instructor. Introduction to 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. F, S, SS

299. Special Topics in Psychology, 1-3 credits. On demand.

301. Industrial and Organizational Psychology, 3 credits. Prerequisite: any basic statistics course. Selection, training, motivation, leadership, job satisfaction, human engineering and working environments as applied to business and industry. F

303. Research Methods in Psychology, 4 credits. Prerequisites: Math 103 or 104, Psyc 241. Methods of gathering knowledge in psychology with special emphasis on the experimental method. F, S

331. Behavior Modification and Therapy, 3 credits. Theory and practice in the application of operant and classical conditioning procedures to humans in applied settings. S

355. Adulthood and Aging, 3 credits. Prerequisite: Psyc 111 plus 3 credits of Psychology. Basic findings and theoretical issues in the study of human aging from biopsychosocial and socio-psychological perspectives with an emphasis on the individual. F

360. Introduction to Personality, 3 credits. Examination of basic concepts in the field of personality. F

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. (No longer equivalent to Soc 361). S

395. Practical Experiences in Psychology, 1-4 credits, repeatable to 8. Prerequisites: Junior or senior status, completed Psychology 303 with a grade of C or above, minimum GPA of 2.0. A practical work experience associated with the student’s academic study of psychology. Arranged by mutual agreement among student, department, and placement site. S/U grading only, F, S, SS

397. Cooperative Education, 1-4 credits, repeatable to 8. Prerequisites: Junior or Senior status, completed Psyc 303 with a grade of C or above, minimum GPA of 2.0. 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. F, S, SS

405. History and Systems of Psychology, 3 credits. Prerequisite: Psyc 303. A consideration of the historical background and development of problem areas in psychology and a survey of contemporary psychological theories. F, S

421. Diversity Psychology, 3 credits. Prerequisites: Psyc 241 and 250 or consent of instructor. Origins and consequences of psychological differences among individual and groups with special emphasis on sex differences and racial differences. S/2

433. Psychology of Learning, 4 credits. Prerequisite: Psyc 303. Principles of animal and human learning, with special emphasis on the acquisition, extinction and retention of learned behavior patterns. Course includes recitation and laboratory. F/2

434. Motivation and Emotion, 4 credits. Prerequisite: Psyc 303. Survey of theories and experimental work on motivation and emotion. Course includes recitation and laboratory. F/2

435. Physiological Psychology, 4 credits. Prerequisites: Biol 150,151, Psyc 303, or consent of instructor. Physiological basis of psychological functions. Course includes recitation and laboratory. S

436. Perception, 4 credits. Prerequisite: Psyc 303. Perceptual basis of behavior. S/2

437. Psychophysiology, 4 credits. Prerequisites: Psyc 303. Examination of the anatomy and physiology of several physiologic systems, the relationships between behavior and physiology, and the importance of individual differences in physiological responses. Course includes recitation and laboratory. F/2

439. Cognitive Psychology, 4 credits. Prerequisite: Psyc 303. An examination of theory and research on attention, memory, language, comprehension, reasoning, problem-solving, and decision-making. Course includes recitation and laboratory. F/2

451. Advanced Developmental Psychology, 3 credits. Prerequisites: Psyc 251 and Psyc 303. In-depth analysis and integration of theories and theorists relevant for current issues in lifespan developmental psychology. S

460. Advanced Social Psychology, 3 credits. Prerequisites: Psyc 303, 361 (or Soc 361). 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. F

465. Multicultural Psychology, 3 credits. Prerequisite: Psyc 241. Examination 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. On demand.

470. Introduction to Clinical Psychology, 3 credits. Prerequisites: Psyc 241, 270 or consent of instructor. A systematic survey of the field of clinical psychology; basic concepts in diagnosis, psychotherapy, research and professional problems. F

485. Seminar in Psychology, 1-3 credits. Prerequisite: consent of instructor. On demand.

489. Senior Honors Thesis, 1 to 15 credits; total not to exceed fifteen. Prerequisite: consent of the Department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F, S, SS

492. Individual Projects in Psychology, 1-4 credits. Repeatable to 8 credits. Prerequisite: consent of instructor. This course is intended to provide students with in-depth experiences not covered adequately in usual course offerings. These experiences may include independent research projects or extensive readings on topics of interest. F, S, SS

493. Tutoring in Psychology, 2 credits. Repeatable to 4 credits. Prerequisite: consent of instructor. S-U grading only. F, S

494. Advanced Individual Research, 1-4 credits, repeatable to 8 credits. Prerequisite: Psyc 303 and consent of instructor. 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. F, S, SS

495. Advanced Special Topics in Psychology, 1-3 credits. Prerequisite: consent of instructor. On demand.
Public Administration (Pols)

Harsell, Jensen (Adviser), Jendrysik (Chair), Light, Sum 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 Department also offers the B.A. with a major or minor in Political Science through the College of Arts and Sciences. (See Political Science listed separately in this catalog.) The Public Administration program has a core of liberal arts courses combined with courses from the administrative sciences. The Political Science program provides students with a broad background in the liberal arts. The communication and analytical skills emphasized in both programs 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 Graduate School 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 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. General Education Requirements (see University GER listing).

II. The applicable College of Business and Public Administration Requirements (see BPA listing).

III. The Following Curriculum:

Pre-Public Administration Core

Acct 200, 201 .... Elements of Accounting I & II .................................................(6)
IlSys 117 ......... Personal Productivity with Information Technology ....(1)
Econ 201 ......... Principles of Microeconomics .................................................(3)
Econ 202 ......... Principles of Macroeconomics .................................................(3)
Econ 210 ......... Introduction to Business and Economic Statistics .................(3)
Math 103 ......... College Algebra .................................................................(3)
Pols 115, 116 .... American Government I, State and Local Government ....(6)
Comm 110 ......... Fundamentals of Public Speaking .........................................(3)
Pols 250 ......... Politics of Public Administration .............................................(3)

IV. GENERAL PUBLIC ADMINISTRATION

Required:

Econ 324 ......... Public Finance .................................................................(3)
Pols 300 ......... Introduction to Research Methods .........................................(3)
Pols 309 ......... Legislative and Executive Processes ......................................(3)
Pols 404 ......... Urban Politics and Administration .........................................(3)
Pols 432 ......... Public Policy Making Process ...............................................(3)
Pols 437 ......... Administrative Processes .....................................................(3)
Pols 493 ......... Professional Projects in Public Administration .....................(3)
Mgmt 300 ......... Principles of Management ...................................................(3)
Mgmt 310 ......... Organizational Behavior .....................................................(3)
Soc 431 ......... Organizations and Behavior ...............................................(3)
Mgmt 400 ......... Organizational Theory and Analysis ...................................(3)

Electives (consult with adviser for Public Administration): courses in political science, management, economics, history, sociology, anthropology, geography, accounting, and psychology.

MINOR IN PUBLIC ADMINISTRATION

Required 21 credits, including:

Pols 250 ......... Politics of Public Administration .........................................(3)
Pols 300 ......... Introduction to Research Methods, or its Equivalent .........(3)
Pols 404 ......... Urban Politics and Administration .........................................(3)
Pols 432 ......... Public Policy Making Process ...............................................(3)
Pols 437 ......... Administrative Processes .....................................................(3)

Select 6 hours from:

Econ 324 ......... Public Finance .................................................................(3)
Mgmt 305 ......... Managerial Concepts, or its Equivalent ............................(3)

Other courses may be elected with the consent of the Department.

Courses

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


250. Politics of Public Administration, 3 credits. Prerequisites: Pols 115. 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. F, S

300. Introduction to Research Methods, 3 credits. General consideration of research methods and data analysis in political science and the social sciences. F

308. Intergovernmental Relations, 3 credits. Analyzes the growing interrelationship of federal, state and local governments with emphasis on financial aspects. F, S

309. Legislative and Executive Processes, 3 credits. A survey of the organization, functions and interaction of the American legislative and executive branches of government. S

404. Urban Politics and Administration, 3 credits. Prerequisite: Pols 115. Analysis of the socio-economic context of urban America and its impact on politics, policy, and administration. S

432. Public Policy Making Processes, 3 credits. Prerequisite: Pols 115. 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. S

433. The Administrator and Public Affairs, 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 administration. S/F


480. Administrative Internship, 2-6 credits. Prerequisite: 12 hours in Political Science. On-the-job training in a government position with final report and analysis of the agency by the intern. Prior approval of instructor required before enrollment. S/U grading only. F, S

493. Professional Project in Public Administration, 3 credits. Prerequisite: Senior standing. A capstone course in Public Administration 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. The course is designed for Public Administration majors only. S

Additional elective courses listed under Political Science.

Recreation and Leisure Services (RLS)

Schroeder (Program Coordinator)

The Recreation and Leisure Services Program believes that significant individual and societal benefits are derived from leisure activity and recreation. The mission of the RLS Program is to promote enhanced quality of life through recreation, leisure and activity for the people of North Dakota and beyond. The RLS Program works toward this mission through the professional preparation of students for careers in the recreation, parks and leisure services field; 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 community and professional organizations on the state, regional, and national levels.

Educational Programs

Housed in the Department of Counseling, the Recreation and Leisure Services Program offers a major which leads to a Bachelor of
Science degree in Recreation and Leisure Services and a minor in Recreation and Leisure Services.

**College of Education and Human Development**

**B.S. IN RECREATION AND LEISURE SERVICES**

Students apply for admission to the Recreation and Leisure Services 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, Soc 110 and Comm 110 are required for admission. Students interested in admission should consult the Counseling Department.

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 College of Education and Human Development Requirements (see EHD listing).

III. Recreation and Leisure Service Prerequisites:

Comm 110 ............. Fundamentals of Public Speaking ........................................ (3)
Psyc 111 ............. Introduction to Psychology ....................................................... (3)
Soc 110 ............. Introduction to Sociology .......................................................... (3)

IV. Recreation and Leisure Services Core Requirements:

Mgmt 305 ............. Managerial Concepts .............................................................. (3)
RLS 201 ............. Leisure and Society ................................................................. (3)
RLS 202 ............. Intro to the RLS Profession .......................................................... (1)
RLS 204 ............. Recreational Leadership ............................................................ (3)
RLS 222 ............. Program Planning in Recreation and Leisure ....................... (3)
RLS 223 ............. Program Implementation in Recreation and Leisure .......... (3)
RLS 272 ............. Recreation and the Natural Environment ......................... (3)
RLS 321 ............. Human Resources for Recreation ..................................... (2)
RLS 360 ............. Inclusion in Recreation Settings ............................................. (3)
RLS 385 ............. Professional Development I ................................................. (1)
RLS 398 ............. Field Experience ................................................................. (1)
RLS 398 ............. Field Experience ................................................................. (1)
RLS 421 ............. Research and Evaluation Methods ......................................... (3)
RLS 442 ............. Financing Recreation and Leisure Services ....................... (3)
RLS 479 ............. Recreation Areas and Facilities ......................................... (3)
RLS 485 ............. Professional Development II ................................................. (1)
RLS 497 ............. Internship in Recreation ....................................................... (12)

Elective RLS credits ......................................................... 6

Approved Basic Statistics Course* ........................................... (3)
Approved Advanced Behavior Science Course** ....................... (3)
Total Hours ........................................................................ 61

*Statistics courses: Econ 210, Psy 241, Soc 326 or equivalent

**Advanced Behavioral Science courses: Soc 253, 331, 335, 352, 355, 361, 431; SWk 257, Psy 250, 331, 355, 361

**MINOR IN RECREATION AND LEISURE SERVICES**

Required for the Recreation and Leisure Services minor.

20 credits, including:

RLS 201 ............. Leisure and Society ................................................................. (3)
RLS 222 ............. Program Planning in Recreation and Leisure ....................... (3)
RLS 360 ............. Inclusion in Recreation Settings ............................................. (3)
RLS 398 ............. Field Experience in Recreation Leisure Services ............... (2)

Elect 9 credits of RLS courses as approved by an RLS adviser.

**Courses**

201. Leisure and Society. 3 credits. Prerequisite: Soc 110 and Psy 111. Orientation to recreation and leisure, including sociological, psychological, historical, philosophical and professional implications and influences of recreation and leisure in society.

202. Introduction to the RLS Profession. 1 credit. Prerequisite: RLS 201. RLS majors only. Introduction to the recreation, parks and leisure services profession.

204. Recreation Leadership. 3 credits. Development of understanding of and ability to utilize leadership and group facilitation strategies to enhance individual’s leisure experiences.

222. Program Planning in Recreation and Leisure. 3 credits. Prerequisite: RLS 201. Development of programming skills for recreation programs in various settings, i.e., public, profit with emphasis on activity selections, scheduling and staffing.

223. Program Implementation in Recreation and Leisure. 3 credits. Prerequisite: RLS 222. Implementation and evaluation of programs planned in RLS 222.


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.

279. Cooperative Education: Introduction to Recreation. 1-4 credits, repeatable to 8. An experiential/service learning experience through a recreation-oriented job for non-majors. Arranged by a mutual agreement among student, department, and employer. Students may count a maximum of 8 credits of RLS 297 and RLS 397 toward the RLS degree.

321. Human Resources for Recreation. 2 credits. Prerequisites: RLS 204, Mgmt 305. The supervision of human resources for the leadership of recreation and leisure services.

359. Introduction to Therapeutic Recreation. 3 credits. Prerequisite: RLS 201. An overview of the nature and scope of therapeutic recreation by examination of the history, philosophy, service delivery systems and issues that confront the profession.

360. 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.

361. Principles of Therapeutic Recreation. 3 credits. Prerequisite: RLS 359. In depth examination of the therapeutic recreation process in clinical, residential and community settings.

370. Principles of Tourism. 3 credits. Overview of tourism including travel behavior, tourism planning and policy, tourism impacts and promotion of tourism.

371. Outdoor Recreation and Resources Management. 3 credits. The principles of managing outdoor recreation sites and visitor systems where the natural environment provides the dominant attraction. Selected parks, resorts, camps, and preserves will serve as example applications of management strategies.

385. Professional Development I. 1 credit. Prerequisite: completion of RLS 202. Individual and group study of career opportunities and professional development in the recreation and leisure services field.

397. Cooperative Education in Recreation and Leisure Services. 1-4 credits, repeatable to 16. Prerequisite: RLS 201. A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department and employer.

399. Field Experience in Recreation and Leisure Services. 1-8 credits. Prerequisite: consent of instructor. Placement of student in a practical setting under university faculty supervision.

406. Design and Administration of Therapeutic Recreation. 3 credits. Prerequisites: RLS 321 or permission of instructor. An examination of the systematic design and administration of therapeutic recreation programs. Emphasis is on principles of program planning, development of program objectives, program content, program evaluation, and management of program resources.

407. Environmental Interpretation. 3 credits. The principles, methods, and materials of interpretive naturalist programs for recreational agencies. Emphasis is placed on obtaining practical experience in developing interpretive materials and programs.

479. Recreation Areas and Facilities. 3 credits. Prerequisite: RLS 321 or consent of instructor. Design and maintenance of recreation areas and facilities. Includes on-site visits.

485. Professional Development II. 1 credit. Prerequisite: RLS 385. Independent and group study of professional development and placement for the recreation and leisure services field.


517. Supervision of Human Resources for the Leadership of Recreation and Leisure Services. 3 credits. Prerequisite: Soc 110 and Psy 111. Orientation and the interrelationship among people, the environment and leisure.

519. History, Philosophy, Service Delivery Systems and Issues that Confront the Profession. 3 credits. A study of the principles and guidelines for outdoor recreation programming.

520. 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.

522. Program Planning in Recreation and Leisure. 3 credits. Prerequisite: RLS 201. Development of programming skills for recreation programs in various settings, i.e., public, profit with emphasis on activity selections, scheduling and staffing.

523. Program Implementation in Recreation and Leisure. 3 credits. Prerequisite: RLS 222. Implementation and evaluation of programs planned in RLS 222.


528. 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.

**Rehabilitation and Human Services (RHS)**

Houston and Perry (Program Coordinator)

People with disabilities are experiencing greater community integration in our society than ever before. Enhancing the 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 personal development.
economic independence of persons with physical, developmental, 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, 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). An overall GPA of 2.5, completion of 40 hours of rehabilitation-related volunteer work, and a written statement of interest in professional rehabilitation practice are also required for admission. Students interested in applying for admission should contact the program coordinator.

To encourage students who are majoring in Rehabilitation and Human Services to extend their studies to include a graduate degree, the Department of Counseling Psychology and Community Services (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 Department in the Graduate section of the catalog.

College of Education and Human Development

B.S. IN REHABILITATION AND HUMAN SERVICES

Required 125 credits which must include the following:

I. General Education Requirements (see University GER listing).

II. College of Education and Human Development requirements (see EHD listing).

III. Core Curriculum (35 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<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 309</td>
<td>Medical and Psychosocial Aspects of Disability I</td>
<td>3</td>
</tr>
<tr>
<td>RHS 310</td>
<td>Medical and Psychosocial Aspects of Disability II</td>
<td>3</td>
</tr>
<tr>
<td>RHS 455</td>
<td>Rehabilitation Process</td>
<td>3</td>
</tr>
<tr>
<td>RHS 457</td>
<td>Vocational Development in Rehabilitation</td>
<td>3</td>
</tr>
<tr>
<td>RHS 465</td>
<td>Professional Issues in Rehabilitation</td>
<td>2</td>
</tr>
<tr>
<td>RHS 475</td>
<td>Testing and Assessment</td>
<td>3</td>
</tr>
<tr>
<td>RHS 491</td>
<td>Rehabilitation Field Seminar</td>
<td>3</td>
</tr>
<tr>
<td>RHS 497</td>
<td>Internship in Rehabilitation</td>
<td>10</td>
</tr>
</tbody>
</table>

IV. Extra Departmental Requirements (44 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 101</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>Engl 125</td>
<td>Technical and Business Writing</td>
<td>3</td>
</tr>
<tr>
<td>History</td>
<td>Any Course</td>
<td>3</td>
</tr>
<tr>
<td>Literature</td>
<td>Any Course (English department)</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 305</td>
<td>Managerial Concepts</td>
<td>3</td>
</tr>
<tr>
<td>Political Science</td>
<td>Any Course</td>
<td>3</td>
</tr>
<tr>
<td>Psy 250</td>
<td>Developmental Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SWk 317</td>
<td>Social Work Research</td>
<td>3</td>
</tr>
<tr>
<td>Soc 361</td>
<td>Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Statistics</td>
<td>Any Course</td>
<td>3</td>
</tr>
</tbody>
</table>

V. At Least One Concentration from the Following (10 credits):

1. Substance Abuse
   - SWk 315 | Substance Use and Abuse | 2
   - Plus a minimum of 8 credits from the following:
     - T&L 350 | Development and Education of the Adolescent | 3
     - RHS 201 | Leisure and Society | 3
     - RLS 360 | Inclusion in Recreation Settings | 3
     - PPT 315 | Introduction to Pharmacology | 3
     - PPT 410 | Drugs Subject to Abuse | 2
     - Psy 270 | Abnormal Psychology | 3
     - Soc 355 | Drugs and Society | 3
   - Other courses as approved by Program Coordinator

2. Mental Health
   - RHS 375 | Community Living Topics: Severe Mental Illnesses | 3
   - Plus a minimum of 7 credits from the following:
     - RLS 201 | Leisure and Society | 3
     - RLS 360 | Inclusion in Recreation Settings | 3
     - Psy 270 | Abnormal Psychology | 3
     - Psy 360 | Introduction to Personality | 3
     - T&L 319 | Introduction to ED, LD and C/DD | 3
   - Other courses as approved by Program Coordinator

VII. Cultural Diversity (6 credits from the following):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anth 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>Anth 379</td>
<td>Area Culture Studies</td>
<td>3</td>
</tr>
<tr>
<td>Anth 465</td>
<td>Culture, Illness and Health</td>
<td>3</td>
</tr>
<tr>
<td>IS 121</td>
<td>Introduction to Indian Studies</td>
<td>3</td>
</tr>
<tr>
<td>IS 151</td>
<td>White Images of Native Americans</td>
<td>3</td>
</tr>
<tr>
<td>IS 345</td>
<td>Contemporary American Indian Issues</td>
<td>3</td>
</tr>
<tr>
<td>IS 370</td>
<td>North American Indians</td>
<td>3</td>
</tr>
<tr>
<td>REL 101</td>
<td>Introduction to Religion (West)</td>
<td>3</td>
</tr>
<tr>
<td>REL 102</td>
<td>Introduction to Religion (East)</td>
<td>3</td>
</tr>
<tr>
<td>RELS 116</td>
<td>Women and Religion</td>
<td>3</td>
</tr>
<tr>
<td>Soc 250</td>
<td>Diversity in American Society</td>
<td>3</td>
</tr>
<tr>
<td>Soc 340</td>
<td>Sociology of Gender and Sex Roles</td>
<td>3</td>
</tr>
<tr>
<td>Soc 436</td>
<td>Social Inequality</td>
<td>3</td>
</tr>
<tr>
<td>CSD 101</td>
<td>American Sign Language I</td>
<td>3</td>
</tr>
</tbody>
</table>

Other courses as approved by CSD advisers

MINOR IN REHABILITATION AND HUMAN SERVICES

(20 credits)

I. Required Courses (15 credits):

1. RHS 200 | Contemporary Issues in Rehabilitation | 3
2. RHS 309 | Medical and Psychosocial Aspects of Disability I | 3
3. RHS 310 | Medical and Psychosocial Aspects of Disability II | 3
4. OT 432, PT 409, or Nurs 360 for respective majors | 3
5. RHS 455 | Rehabilitation Process | 3
6. RHS 475 | Vocational Development in Rehabilitation | 3
7. RHS 475 | Testing and Assessment | 3

II. Elective Courses (5 credits from the following):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
</table>
| Anat 204 | Anatomy for Paramedical Personnel | 3
| CSD 343 | Language Development | 3
| CSD 353 | Language Disorders | 3
| Nurs 490 | Transcultural Health Care Theories, Research and Practice | 3
| Psy 270 | Abnormal Psychology | 3
| RHS 200 | Helping Skills in Community Living | 3
| RHS 375 | Community Living Topics | 3
| RHS 360 | Inclusion in Recreation Settings | 3
| RHS 361 | Principles of Therapeutic Recreation | 3
| SWk 314 | Child Welfare | 3
| T&L 315 | Education of Exceptional Students | 3
| T&L 421 | Transition to Adult Life | 3
| T&L 428 | Assisitive Technology | 3
| CSD 101 | American Sign Language I | 3

Courses

200. Helping Skills in Community Services | 3

Courses provide 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
Resident Officer Training Corps
Air Force (AFROTC)

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

The program is conducted by North Dakota State University faculty on the UND campus. Students interested in participating in the program should contact: Air Force ROTC Detachment 610, 255 Centennial Drive, Armory Building, Room 2, Stop 8360, University of North Dakota, Grand Forks ND 58202, (701) 777-0437/4732.

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 for first year and sophomore or AS 410 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 (AS 111, 112, 211, 212). 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 various Air Force Bases. Students in the four-year program participate in four weeks of field training during the summer after their sophomore year. Students applying for entry into the two-year program must successfully complete six weeks of field training prior to enrollment in AFROTC.

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

The six-week field training course covers the same areas of study as the four-week program and includes an additional two weeks of academic instruction in general military courses.

LEADERSHIP LABORATORY

The four-week Laboratory (AS 210 - 1 credit and AS 410 - 1 credit) Repeatable. Instruction is conducted within the framework of the 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. AS 210 is a corequisite of AS 111, 112, 211 and 212. AS 410 is a corequisite of AS 321, 322, 441, and 442.

Professional Officer Course (POC)
The Professional Officer Course (AS 321, 322, 441, 442) taken during the student’s junior and senior years, concentrates on four main themes: communication skills, national security forces in contemporary American society, the principles and practices of management and leadership in the U.S. Air Force.

Courses (AS)

110. Air Force ROTC Fitness. 1 credit. Repeatable. Introduction to various AFROTC teams sports. Promotes benefits of being physically fit and maintaining Air Force fitness standards. F/S


210. Leadership Laboratory. 1 credit. Repeatable. Introduction to Air Force customs and courtesies, drill and ceremonies, and military commands. S/U grading. F/S

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

212. The Evolution of USAF Air and Space Power II. 1 credit. Corequisite: AS 210, Leadership Laboratory. 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. S

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

322. Air Force Leadership Studies II. 3 credits. Corequisite: AS 410, Leadership Laboratory. 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. S

410. Leadership Laboratory. 1 credit. Repeatable. 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. S/U grading. F/S

441. National Security Affairs and Preparation for Active Duty I. 3 credits. Corequisite: AS 410, Leadership Laboratory. A study of the national security process, regional studies, advanced leadership ethics and Air Force doctrine. Topics include the military as a profession, officership, military justice, civilian control of the military, and current issues. Application of communication skills is included. F

442. National Security Affairs and Preparation for Active Duty II. 3 credits. Corequisite: AS 410, Leadership Laboratory. A continuation of AS 441. Topics include the military as a profession, officership, military justice, civilian control of the military, and current issues. Continued application of communication skills and preparation for a new officer’s first active duty assignment are included. S

Social Science

The Social Science related fields concentration offers the student a variety of courses in Anthropology, Economics, Geography, History, Political Science and Sociology. The program is designed to permit the student to achieve a moderate concentration in one field and complementary work in all others. 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 listing).

College of Arts and Sciences
T. Rand, Adviser

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. General Education Requirements (see University GER listing).
II. The Following Curriculum:
   60 credits
   Select courses in the pattern listed below from Anthropology, Economics, Geography*, History, Political Science, and Sociology. At least 24 credits must be in Upper Level work.
   21 credits in one department.
   12 credits in another department.
   9 credits in each of three of the remaining departments.

* For Geography courses carrying Social Science credit, see University GER listing

Social Work (SWk)

Barkdull, Bruno, Haga (BSSW Coordinator), Heitkamp (Chair), Kraft, Reeves, Schneweis, Quinn and Woehle

The Department of Social Work offers a Bachelor of Science in Social Work and a Master of Social Work degree. The mission of the Department of Social Work at the University of North Dakota is to prepare entry-level and advanced generalist Social Workers for the region to advance practice knowledge, values and skills consistent with the highest ideals of the profession by:

1. Empowering vulnerable, oppressed, disadvantaged, and rural populations;
2. Maximizing opportunities for every individual to realize his or her highest potential; and
3. Promoting respect, awareness, and appreciation for culture and social justice at every level of society.

The goals of the Bachelor of Science in Social Work program, first accredited by the Council on Social Work Education in 1974, are to prepare entry-level generalist social work practitioners and to prepare students for graduate social work education. Social Work courses were first offered at the University of North Dakota in 1905; the social work program was formally established in 1939. The Council on Social Work Education (2002) states, “The purposes of social work education are to prepare competent and effective professionals, to develop social work knowledge, and to provide leadership in the development of service delivery systems. Social work education is grounded in the profession’s history, purposes, and philosophy and is based on a body of knowledge, values, and skills. Social work education enables students to integrate the knowledge, values, and skills of the social work profession for competent practice.”

Students interested in declaring social work as a major meet with the coordinator of the BSSW program, who will work with the student to create a plan of study. Students are then assigned an adviser, who will work with the student throughout the rest 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:
1. Completion of SWK 255 and 257
2. Overall GPA of 2.40
3. Grade of B or higher in SWK 255 and 257
5. Completion of 45 semester hours of coursework at the end of the term in which the application is submitted.
6. Students may apply during any term including fall, spring, or summer. Deadlines will be published each term on the Department of Social Work webpage. To apply for admission to the program, students complete the application, available on the Department’s website, in consultation with their advisor. The BSSW coordinator will notify the student of the decision.

The application process is competitive. All factors including grade point average, strength of written materials, and volunteer experience will be given consideration in decisions surrounding admission. The BSSW coordinator will notify the student of the decision regarding admission. Following admission, students are required to sign the following statements: 1) That they are aware they will need to pass the required BSSW comprehensive exam prior to graduation; and 2) That they will adhere to the National Association of Social Workers (NASW) Code of Ethics and the University of North Dakota Code of Student Life.

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 Coordinator.
Progression Through the Program and Graduation Requirements

After admission to the social work program, a student must maintain an overall GPA of 2.40, a GPA of 2.40 in all social work courses, and a C or better in any social work course. Transfer credit for courses follows university and Council on Social Work Education (CSWE) requirements. All transfer social work courses must be from an accredited BSSW program.* No credit is given for life experience. Students must complete the required social work courses (39 credit hours). All University requirements must be met by all students, including those in the “fast track” in order to graduate from UND with a baccalaureate degree in Social Work.

Field Instruction. The field instruction placement in a human service organization is the capstone experience for BSSW students. The field experience integrates knowledge, values and skills from completed social work courses. Application dates will be published each term.

Students are required to pass the comprehensive exam given by the Department of Social Work prior to graduation.

*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.

College of Education and Human Development

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. General Education Requirements (see University GER listing).
II. The following curriculum.

A. Social Work (39 hours)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 255</td>
<td>Social Work in a Modern Society</td>
<td>(4)</td>
</tr>
<tr>
<td>SWK 257</td>
<td>Human Behavior in 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 in 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>SW 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 Instruction I</td>
<td>(5)</td>
</tr>
<tr>
<td>SWK 482</td>
<td>Field Instruction Seminar I</td>
<td>(1)</td>
</tr>
<tr>
<td>SWK 483</td>
<td>Field Instruction II</td>
<td>(5)</td>
</tr>
<tr>
<td>SWK 484</td>
<td>Field Instruction Seminar II</td>
<td>(1)</td>
</tr>
<tr>
<td>Social Work elective ...</td>
<td>(2)</td>
<td></td>
</tr>
</tbody>
</table>

B. Liberal Arts Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psy 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>Pol 155</td>
<td>American Government I</td>
<td>(3)</td>
</tr>
<tr>
<td>Additional Social Sciences Courses</td>
<td>(15)</td>
<td></td>
</tr>
<tr>
<td>Statistics</td>
<td></td>
<td>(2-3)</td>
</tr>
<tr>
<td>Human biology content</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Credit Hours .......................................................... (12)

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 USE/ABUSE AWARENESS MINOR

Required: 20 credits including:

1) The following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPT 410</td>
<td>Drugs Subject to Abuse</td>
<td>(2)</td>
</tr>
<tr>
<td>Soc 355</td>
<td>Drugs and Society</td>
<td>(2)</td>
</tr>
<tr>
<td>SWK 315</td>
<td>Substance Use and Abuse</td>
<td>(2)</td>
</tr>
</tbody>
</table>

2) Thirteen from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm 301</td>
<td>Psychology of Communication</td>
<td>(3)</td>
</tr>
</tbody>
</table>

* Course required for licensing in addiction counseling.

C. Social Work Elective

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHS 309</td>
<td>Medical and Psychosocial Aspects of Disability I</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development &amp; Education of the Adolescent</td>
<td>(3)</td>
</tr>
</tbody>
</table>

MINORS

Students may choose a minor outside the College of Education and Human Development 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 five courses in four disciplines. Students select another 6 credits to earn 21 credits in coursework related to gerontology.

Required:

1) 12 credit hours:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 313</td>
<td>Orientation to Gerontology</td>
<td>(3)</td>
</tr>
<tr>
<td>Nurs 418</td>
<td>Physical Changes of Aging</td>
<td>(3)</td>
</tr>
<tr>
<td>Psy 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>

2) 9 hours from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSR 356</td>
<td>Aging and Communication Processes</td>
<td>(3)</td>
</tr>
<tr>
<td>Phil 215</td>
<td>Contemporary Moral Issues</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 121</td>
<td>Introduction to Indian Studies</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 300</td>
<td>Technology and Society</td>
<td>(3)</td>
</tr>
<tr>
<td>Nutr 240</td>
<td>Fundamentals of Nutrition</td>
<td>(3)</td>
</tr>
<tr>
<td>Psy 331</td>
<td>Behavior Modification and Therapy</td>
<td>(3)</td>
</tr>
<tr>
<td>Psy 421</td>
<td>Individual and Group Differences</td>
<td>(3)</td>
</tr>
<tr>
<td>Rel 345</td>
<td>Death and Dying</td>
<td>(3)</td>
</tr>
<tr>
<td>RLS 360</td>
<td>Inclusion in Recreational Setting</td>
<td>(3)</td>
</tr>
<tr>
<td>Soc 354</td>
<td>Medical Sociology</td>
<td>(3)</td>
</tr>
<tr>
<td>SWK 257</td>
<td>Human Behavior in the Social Environment I</td>
<td>(3)</td>
</tr>
<tr>
<td>RHS 309</td>
<td>Medical and Psychosocial Aspects of Disability I</td>
<td>(3)</td>
</tr>
<tr>
<td>RHS 310</td>
<td>Medical and Psychosocial Aspects of Disability II</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Students must complete the required social work courses (39 credit hours).

Full-Time Fast track Schedule for BSSW (39 hours):

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>SWK 255 Social Work in a Modern Society... (4) SWK 257 HBSE I... (3) SWK 317 Social Work Research... (3) SWK 424 Generalist Social Work: Individuals and Families... (3) SWK 454 Generalist Social Work Communities &amp; Organizations... (3) Social Work Elective ... (2) Total Credit Hours ... (15)</td>
</tr>
<tr>
<td>Spring</td>
<td>SWK 357 HBSE II... (3) SWK 434 Generalist Social Work Task &amp; Treatment Groups... (3) SWK 442 Social Policy... (3) SWK 454 Generalist Social Work Communities &amp; Organizations... (3) Total Credit Hours ... (12)</td>
</tr>
<tr>
<td>Summer</td>
<td>SWK 481 Field Instruction I... (5) SWK 482 Field Instruction Seminar I... (1) SWK 483 Field Instruction II... (5) SWK 484 Field Instruction Seminar II... (1) Total credit Hours ... (12)</td>
</tr>
<tr>
<td>Elective Social Work Courses:</td>
<td>SWK 311 Child Welfare... (3) SWK 312 Social Work and the Legal Process... (2) SWK 313 Orientation to Gerontology... (3) SWK 315 Substance Use and Abuse... (2) SWK 397 Cooperative Education... (1-6) SWK 489 Seniors Honor Thesis... (1-8, repeatable to 9)</td>
</tr>
</tbody>
</table>
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 are admitted to this training on two levels. The first level includes social work majors who also complete the minor in Chemical Use/Abuse Awareness (required courses for licensing in addiction counseling, or their equivalent) and the nine-month 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 complete 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.

Courses

255. Social Work in a Modern Society. 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


311. Child Welfare. 3 credits. Child welfare, historical and current status of children, their families, and their environment. S

312. Social Work and the Legal Process. 2 credits. Introduction to the legal system's interaction with the human service delivery system. F

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

315. Substance Use and Abuse. 2 credits. Introduction to the dynamics of drug addiction and related issues, with special emphasis on alcohol. S

317. Social Work Research. 3 credits. Prerequisite or corequisite: SWK 255 for Social Work majors and RHS 250 for Rehabilitation and Human Service majors. Qualitative and quantitative methods of social work research and evaluation. F, S

327. Human Behavior in the Social Environment II. 3 credits. Prerequisites or corequisites: Soc 110. Social work theory and research, with ecological/social systems theory as the conceptual framework. Theories regarding development of groups, communities and organizations. ES

397. Cooperative Education. 1-6 credits. Prerequisite: consent of instructor. Individually supervised experiences in a human service agency. Integrates social work practice with related issues, with special emphasis on alcohol. S

424. Generalist Social Work Practice with Individuals and Families. 3 credits. Prerequisite or corequisite: Admission to the BSSW Program. Generalist practice with individuals and families within the context of an ecological systems perspective, using the problem solving process, and the strengths perspective. Evaluation of practice. F

434. Generalist Social Work Practice with Task and Treatment Groups. 3 credits. Prerequisite: Admission to the BSSW program. Prerequisite or corequisite: SWK 357. Generalist practice with task and treatment groups within the context of an ecological systems perspective using the problem solving process and the strengths perspective. Evaluation of practice. S

481. Field Instruction I. 5 credits. Prerequisite: Admission to field program. Corequisite: SWK 482. SU grading only. Also can be taken with SWK 483 for a one-semester block placement in an approved social welfare agency. Provides learning opportunities in generalist social work practice using the problem solving processes within the strengths and ecological systems perspectives. F, SS

482. Field Instruction Seminar I. 1 credit. Corequisite: SWK 481. Integrates classroom content with actual practice. F, SS

483. Field Instruction II. 5 credits. Prerequisite or corequisite: SWK 481. Corequisite: SWK 484. SU grading only. Provides learning opportunities in generalist social work practice using the problem-solving process within the strengths and ecological systems perspectives. F, SS

484. Field Instruction Seminar II. 1 credit. Corequisite: SWK 483. F, SS


493A (regular grading) 493B (SU grading). Special Topics. 1-3 credits. Repeatable to a maximum 6 credits. Prerequisite: SWK 255 or consent of instructor. Individual or group supervised research or interdepartmental studies and seminars in social work related areas. F, S, SS

Sociology

(Soc)

Badahdah, Driscoll, Herbeck, Minnotte, Moen, Staples, Stevens, Stoffersahn, Tiemann (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 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. General Education Requirements (see University GER listing).

II. The following Curriculum:

33 credits, including:

Soc 301 .......... Basic Sociology Theory ..................................................... (3)
Soc 323 .......... Sociological Research Methods ........................................ (3)
Soc 326 .......... Sociological Statistics ..................................................... (3)
Soc 361 .......... Social Psychology .......................................................... (4)

9 credits from:

Soc 306 .......... Social Change ................................................................. (3)
Soc 335 .......... The Family ................................................................. (3)
Soc 431 .......... Organizations and Behavior ........................................... (3)
Soc 435 .......... Racial and Ethnic Relations ........................................... (3)
Soc 436 .......... Social Inequality ........................................................... (3)
Soc 437 .......... Population ................................................................. (3)
Soc 450 .......... Deviant Behavior ............................................................ (3)

Electives in Sociology ............................................................. (11)

A concentration in a single supplementary field other than sociology is also required of all sociology majors. This concentration may be met in two ways: (1) a language proficieny of level IV in a modern foreign language; or (2) 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 SOCIOLOGY

Required 22 credits, including:

Soc 301 .......... Basic Sociological Theory ..................................................... (3)
Soc 323 .......... Sociological Research Methods ........................................ (3)
At least nine of the other credits must be taken in courses numbered 300 and above.

Courses

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 examination administered there. F, S

115. Social Problems. 3 credits. A sociological analysis of major social problems in America. F
250. Diversity in American Society, 3 credits. Prerequisite: Soc 110. An introductory survey of the racial, ethnic and cultural mosaic of American Society. Basic theories of intergroup relations, prejudice and discrimination are covered. F, S

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

253. Juvenile Delinquency, 3 credits. The nature, extent, causes and treatment of delinquency. Delinquency prevention programs are explored. F

301. Basic Sociological Theory, 3 credits. Prerequisite: Soc 110. A survey of the major traditions in the history of sociology. Basic concepts and frames of reference central to sociological theory and analysis are emphasized. F

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

309. Selected Topics, 1-4 credits. Prerequisites to be determined when offered. Selected topics in sociology taught at the junior level. On Demand.

323. Sociological Research Methods, 3 credits. Prerequisite: Soc 301 or CJ 330. A general consideration of methods involved in survey research in the social sciences. F, S

326. Sociological Statistics, 3 credits. It is assumed that students are able to perform basic mathematical and algebraic operations. This course introduces the student to calculation and application of basic statistical techniques employed by sociologists. F, S

331. Rural Sociology, 3 credits. Prerequisite: consent of instructor. A survey of sociological principles as they relate to rural society with emphasis on rural change and rural development. On Demand.

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, S

340. Sociology of Gender and Sex Roles, 3 credits. Prerequisite: Soc 110 or Soc 115 or Soc 250. The implications of gender for social behavior in cross-cultural and historical perspective as well as in contemporary Western society. F

351. Corrections, 3 credits. Prerequisites: Soc 252 or CJ 201. A course describing the correctional system as a part of the criminal justice system. A survey and discussion of topics dealing with offender behavior, institutional programs and community response to ex-offenders. F

352. Aging, 3 credits. Socialization theory and its implication for the aging process. F

354. Medical Sociology, 3 credits. Prerequisite: Soc 110 or 115. Sociological analysis of health care definitions and roles, and the organization, availability and control of health care. F

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

361. Social Psychology, 4 credits. Prerequisite: Soc 110. The study of individual behavior in its social context: how the individual acts upon the social environment, is acted upon by the environment, and interacts with other individuals. F

397. Cooperative Education, 1-6 credits repeatable to 12. A practical work experience with an employer closely associated with student’s academic area. F, S, SS

407. Political Sociology, 3 credits. Sociological analysis of political and para-political groups, voting behavior, political socialization process; power elites, societies and systems of government; power structures. On Demand.

409. Selected Topics in Sociology, 1-4 credits. Topics in sociology taught at the senior level. On Demand.

431. Organizations and Behavior, 3 credits. Prerequisite: 6 hours of Soc or consent of instructor. 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. F

435. Racial and Ethnic Relations, 3 credits. Prerequisite: Soc 301 or CJ 330 and Soc 250. A Survey of major U.S. racial and ethnic groups, the histories of their social encounters, and the theoretical perspectives associated with their experiences. On Demand.

436. Social Inequality, 3 credits. Prerequisite: 6 hours of Soc or consent of instructor. 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. On Demand.

437. Population, 3 credits. Prerequisite: 6 hours of Soc or consent of instructor. A basic consideration of formal and social demography. The determinants and consequences of population change. On Demand.

450. Deviant Behavior, 3 credits. Prerequisite: 6 hours of Sociology coursework or consent of instructor. 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. S

489. Senior Honors Thesis, 1-15 credits; total not to exceed fifteen. Prerequisite: Consent of the Department and approval of the Honors Committee. Supervised independent study culminating in a thesis. F, S

490. Practicum in Sociology, 3 credits. Prerequisites: Soc 301, 323, 326 and at least Junior status. 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. S/ U grading only. F, S

494. Readings in Sociology, 1-5 credits. Prerequisite: Consent of instructor. 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. F, S

Space Studies (SpSt)

Bieri, Gaffney (Interim Chair), Hardersen, McLaughlin, Ryglov and Seelan

A minor in Space Studies is available to introduce students to the complexities of research, development, and operation of a wide array of space ventures. The multi-disciplinary nature of space activity immediately becomes evident, allowing the student to correlate the space experience with areas in a major field of study. Political, legal, and scientific aspects are dealt with extensively, and key technologies are introduced.

John D. Odegard School of Aerospace Sciences

MINOR IN SPACE STUDIES

Required 20 credits, including:

SpSt 200 .......... Introduction to Space Studies ........................................ (3)
SpSt 491 .......... Independent Study ......................................................... (2)

And 15 credits from:

SpSt 300 .......... The Case for Space ....................................................... (3)
SpSt 405 .......... Advanced Space Mission Design .................................. (3)
SpSt 410 .......... Life Support Systems .................................................... (3)
SpSt 420 .......... Space Science & Exploration ........................................ (3)
SpSt 425 .......... Observational Astronomy ............................................. (3)
SpSt 430 .......... Earth System Science .................................................... (3)
SpSt 435 .......... Global Change ............................................................... (3)
SpSt 438 .......... Volcanism: A Planetary Process I .................................... (3)
SpSt 440 .......... Commercialization of Space .......................................... (3)
SpSt 450 .......... Soviet/Russian Space Program ...................................... (3)
SpSt 451 .......... History of the Space Age ................................................ (3)
SpSt 460 .......... Life in the Universe ....................................................... (3)
SpSt 470 .......... Special Topics in Space Studies ..................................... (3)
SpSt 480 .......... Readings in Space Studies ............................................. (3)

Courses

200. Introduction to Space Studies, 3 credits. An introduction to a range of topics in space studies including: 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 course is a prerequisite for undergraduates for all 300 and 400 level Space Studies courses. F, S

300. The Case for Space, 3 credits. Prerequisite: SpSt 200. 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 socio-economic, 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. F/2

405. Space Mission Design, 3 credits. Prerequisite: SpSt 200. 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. On Demand.

410. Life Support Systems, 3 credits. Prerequisite: SpSt 200. 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. F

420. Space Science and Exploration, 3 credits. Prerequisite: SpSt 200. Revolutionary advances that have occurred in astronomy, the earth sciences and planetary science as a result of our entry into space. This course surveys the manned and robotic space missions which have gathered data for this new view of the Universe. The course introduces current concepts in cosmological theory as well as an overview of planetary evolution, solar system dynamical processes and physical characteristics of the planets. F

425. Observational Astronomy, 3 credits. Prerequisites: Phys 110. 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 observ- ing, data reduction, and interpretations; and image processing and color imaging tech- niques. Students will learn to operate a remotely controllable Internet telescope and CCD camera. A broadband Internet connection is recommended. Night observing is required. Corequisite: See F.

430. Earth System Science. 3 credits. Prerequisite: SpSt 200. 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 biogeochemi- cal 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 hard requirements, are examined. On demand.

435. Global Change. 3 credits. Prerequisite: SpSt 200. Investigation of environ- mental changes, often occurring locally, which contribute to large scale global transforma- tions. Some of these changes are natural, others are a consequence of human activity. Topics include comet impacts, population growth, volcanic eruptions, deforestation, biodiversity, water management, global warming, ozone and sustainable societies. On demand.

438. Volcanism: A Planetary Process I. 3 credits. Prerequisite: SpSt 200 or consent of instructor. Volcanism is a fundamental process in the evolution of planetary bodies. In this course undergraduate students are introduced to the fundamentals of planetary evolution and the role volcanism plays in this. Terrestrial volcanism in all its forms and its impacts on the Earth System are discussed. Physical models for various volcanic processes are introduced. Classic eruptions are used to illustrate the impact of volcanism. Using this knowledge as a base, we will explore silicic, cysco- and hydro- carbon volcanism in the solar system. A field trip will be arranged if sufficient interest is expressed by students. On demand.

440. International Space Programs. 3 credits. Prerequisite: SpSt 200. 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. On demand.

451. History of the Space Age. 3 credits. Prerequisites: SpSt 200 or Hist 102 or 104. 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.

460. Life in the Universe. 3 credits. Prerequisite: SpSt 200. This course examines the evolution of the universe from its origin to the present: cosmological evolution, chemical evolution, planetary evolution, biological evolution, and cultural evolution. The possibility of life in the universe elsewhere than Earth is considered. Human changes to the Earth are placed within this context. On demand.

470. Special Topics in Space Studies. 1-3 credits. Prerequisite: SpSt 200. 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. On demand.

480. Readings in Space Studies. 1-3 credits. Prerequisites: SpSt 200 and con- sent of instructor. 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. F,S,SS

491. Independent Study. 2 credits. Prerequisite: SpSt 200, senior standing, 15 hours of Space Studies, and consent of instructor. An independent study project culmi- nating in a paper on an approved topic in Space Studies. Requires regular meetings with the instructor. F,S,SS

Teaching and Learning (T&L)

Andersson, Baker, Barrentine, Chalmers, Chiasson, Combs, Gallo, Gourneau, Grabe, Guy, Hanley, Helgeson, Holdman, Ingwalson, Mahar, Olsen (Chair), Olson, Onchvson, Pearson, Smart, Tepper, Uhlenberg, Van Eck, Walker, Yearwood, J. 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 educa- tion personnel with intensive, intellectually challenging, integrated study.

The Department strives to model the kind of educational envi- ronment it is promoting in early childhood settings, elementary schools, middle schools and secondary schools. Students are encour- aged 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 Uni- versity 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 stud- ines 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:

- **Biology**
- **Chemistry**
- **English**
- **Fisheries and Wildlife Biology**
- **French**
- **Geology**
- **Geography**
- **German**
- **Industrial Technology**
- **Mathematics**
- **Physics**
- **Science**
- **Social Studies**
- **Spanish**
- **Speech/Communication**
- **Visual Arts**

The appropriate sequences of courses and experiences for these majors are outlined under the specific departments offering the maj- ors, 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 listing for information regarding admission to teacher education, graduation and teacher licensure requirements, and other requirements of teacher education students.

**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 advisor for the most accurate program planning.

I. General University Graduation Requirements (see University GER listing).
II. EHD General Graduation Requirements (see EHD listing).
III. The following Early Childhood Education curriculum:

| T&L 250 | Child Development | 3 |
| T&L 286 | Field Experience in Early Childhood Education | 1 |
| Psyc 250 | Developmental Psychology | 4 |
| T&L 300 | Introduction to Early Childhood Education | 3 |
| T&L 310 | Observing and Assessing Child | 3 |
| T&L 312 | Home-School Relations | 3 |
| T&L 313 | Language Development & Emerging Literacy | 3 |
| T&L 314 | Social & Emotional Development & Guidance of Children | 3 |
| T&L 315 | Education of the Exceptional Student | 3 |
| T&L 320 | Infant/Toddler Development & Learning | 3 |
MINOR IN EARLY CHILDHOOD EDUCATION

21 credits including:

T&L 286 Field Experience in Early Childhood Education (1)
T&L 410 Introduction to Early Childhood Education (3)
T&L 311 Observation and Description of Children (3)
T&L 312 Home School Relations (3)
T&L 313 Language Development and Emerging Literacy (3)
T&L 320 Infant/ Toddler Development and Learning (3)
T&L 451 Methods & Materials: Pre-K (3)
T&L 453 Methods & Materials: Kindergarten (2)

B.S. ED. WITH MAJOR IN ELEMENTARY 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. General University Graduation Requirements (see University GER listing).

II. General Education Requirements.

Communication — 9 credits
(English 110, 120 or 125)

Social Sciences — 9 credits
From 2 departments including Psych 250 or T&L 252 (but not both) and T&L 433; additonal credits of University General Education courses from Anthropology, Economics, Geography, Political Science, Psychology (except 250), Sociology, or Indian Studies.

Arts and Humanities — 9 credits
From 2 departments including, Fine Arts 150 required.

Math, Science, Technology — 12 credits
Must be taken in at least 3 departments, must include 2 science courses with corresponding labs. Courses with labs must be chosen from at least two different science areas: physical, biological, earth and/or space studies. Mathematics 103 or a higher math course is required, unless a qualifying score is achieved on the math placement test.

This coursework may be selected from the General Education course list or from a combination of such courses and T&L 470 science courses. Note that T&L courses do not apply toward the General Education Requirement. Students must also demonstrate computer competence. This can be done by gaining credit in CSCI 101 and 101T, IT 316, or T&L 390, Technology for Teachers, or by demonstrating competence to designated faculty or staff.

III. 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 GER to your minor or specialty area. Select from: Anthropology, Art, Bilingual Education/ESL, Early Childhood Education, Economics, English, Fine Arts, Foreign Language, Geography, History, Indian Studies, Kindergarten Endorsement, Literacy Education, Mathematics, Middle School, Music, Physical Education, Political Science, Psychology, Science, Social Studies, Sociology, Special Education, Technology Education or Visual Arts.

IV. Introductory Courses:

T&L 330 Introduction to Teaching and Learning (3)
Math 277 Mathematics for Elementary School Teachers (3)
T&L 315 Education of Exceptional Student (3)
T&L 328 or 329 Children’s or Young Adult Literature (3)
T&L 335 Understanding Readers and Writers (3)

V. Professional Education

TEAM:
T&L 410 Reading and Writing in the Elementary School (TEAM) (3)
T&L 430 Social Studies in the Elementary School (TEAM) (3)
T&L 440 Math in the Elementary School (TEAM) (3)
T&L 470 Science in the Elementary School (TEAM) (3)
T&L 486 Field Experience (2)

Additional Required Courses:

Art 460 Art for Elementary School Teachers (3)
Musc 243 Music for Elementary School Teachers (3)
or
Musc 443 Music Methods and Materials for Elementary or School Teachers (3)
Musc 449 Music Education Special Topics (1-3)
PEXS 305 Health and Physical Education for Elementary School Teachers (3)
T&L 432 Classroom Management (3)
T&L 433 Multicultural Education (3)
FA 150 Introduction to the Fine Arts (3)
Elementary Education Electives (4)
(Some courses have prerequisites.)
T&L 487 Student Teaching: Pre-kindergarten (10-16)
T&L 488 Senior Seminar (3)

One of the following options:

T&L 411 Primary Reading and Language Arts (2)
T&L 412 Intermediate Language Arts (2)
T&L 413/414 Assessing and Correcting Reading Difficulties (2)/Corrective Reading Practicum (2)
T&L 415 Language Literacy Development of English Language Learners (3)
Engl 209 Introduction to Linguistics (3)
Engl 370 Language and Culture (3)
Engl 419 Teaching English as a Second Language (3)

BILINGUAL EDUCATION OR ENGLISH AS A SECOND LANGUAGE ENDORSEMENT

Students who complete the courses listed below will be eligible for endorsement in Bilingual Education or English as a Second Language. Students must be certified to teach in Elementary, Middle Level or Secondary classrooms.

T&L 313 Language Development and Emerging Literacy (3)
T&L 415 Language Literacy Development of English Language Learners (3)
T&L 433 Multicultural Education (3)
T&L 486 Field Experience: Bilingual & ESL (2)
Engl 209 Introduction to Linguistics (3)
Engl 370 Language and Culture (3)
Engl 419 Teaching English as a Second Language (3)

Six credit hours in a modern language. (Teachers planning to work with American Indian students should take appropriate American Indian languages.) Three elective credits in English chosen in consultation with adviser. (English 309 is recommended.) These requirements may be impacted by change at the federal and state level.

B.S. ED. WITH DOUBLE MAJOR IN ELEMENTARY EDUCATION AND 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. General Education Requirements (see University GER listing).

II. EDH General Graduation Requirements (see EDH listing).

III. Elementary Education Curriculum as listed above.

IV. The following Early Childhood Education Curriculum:

T&L 286 Field Experience in Early Childhood Education (1)
T&L 310 Introduction to Early Childhood Education (3)
T&L 311 Observing and Assessing Child Development (3)
T&L 312 Home School Relations (3)
T&L 313 Language Development and Emerging Literacy (3)
T&L 314 Social and Emotional Development and Guidance of Children (3)
T&L 320 Infant/Toddler Development and Learning (3)
T&L 443 Math for Primary Grades (3)
T&L 451 Methods & Materials: Pre-Kindergarten (3)
T&L 453 Methods & Materials: Kindergarten (2)
T&L 454 Organization and Leadership in Early Childhood Education (2)
T&L 456 Pre-Kindergarten Seminar (1)
T&L 487 Student Teaching: Pre-Kindergarten (9)

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 286 Field Experience in Early Childhood Education (1)
T&L 310 Introduction to Early Childhood Education (3)
T&L 311 Observing and Assessing Child (3)
T&L 312 Home School Relations (3)
T&L 313 Language Development and Emerging Literacy (3)
T&L 453 Methods and Materials: Kindergarten (2)
T&L 487 Student Teaching (8)

These requirements may be impacted by change at the federal and state level.

B.S. ED. WITH COMBINED MAJOR IN ELEMENTARY EDUCATION AND MATHEMATICS

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. EHD General Graduation Requirements (see EHD listing).
III. Elementary Education Curriculum as listed above.
IV. The Following Mathematics Curriculum:
   - Math 103 College Algebra or equivalent (3)
   - Math 377 Geometry for Elementary Teachers (2)
   - Math Methods Electives (6)
   - T&L 498 Special Projects: Math Practicum (3)
   - BASIC Computer Programming (2)
   - Math Electives (T&L math courses or math dept.) (10)

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 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. General Education Requirements (see University GER listing).
The Integrated Studies Program is recommended.
II. EHD General Graduation Requirements (see EHD listing).
III. Elementary Education Curriculum (see Elementary Education listing).
IV. The Following Middle Level Education (Grades 5-8) Curriculum:
   - T&L 341 Foundations of Middle Level Education (2)
   - T&L 350 Development and Education of Young Adolescents (3)
   - T&L 390 Technology for Teachers (2)
   - T&L 409 Reading in the Content Areas (3)
   - T&L 465 Middle Level Curriculum and Methods (5)
   - T&L 486 Field Experience (1)

V. Subject Matter Areas of Concentration

Students completing a double major in Elementary and Middle Level Education must take coursework in two content areas in addition to the Elementary and Middle Level major programs of study. These programs must be planned carefully between the student and the advisor in both programs of study to ensure that the requirements for teaching in the subject areas have been met. Examples of content areas include but are not limited to: English, mathematics, science, social studies, health, and technology education.

Middle Level minor is open to students majoring in a field which leads to teacher certification at the elementary or secondary level.

MINOR IN MIDDLE LEVEL EDUCATION

The Middle Level minor is open to students majoring in a field which leads to teacher certification at the elementary or secondary level.

The following Middle Level Education (Grades 5-8) Curriculum is required:

T&L 315 Education of the Exceptional Student (3)
T&L 341 Foundations of Middle Level Education (2)
T&L 350 Development and Education of Young Adolescents (3)
T&L 390 Technology for Teachers (2)
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)

Total hours 21

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 advisor 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.

Secondary Education

Through a partnership with departments in the College of Arts and Sciences and the College of Business, 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 advisors 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 Certification Preparation Sequence

Course Sequence (30 credits minimum):

Pre-admission:

T&L 325 Exploring Teaching in Secondary Schools (3)

Admission to Teacher Education is required for enrollment in all of the following courses:

T&L 345 Curriculum Development and Instruction (3)
T&L 390 Special Topics (1-3)
T&L 350 Development and Education of the Adolescent (3)
*T&L 386 Field Experience, elective (1)
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. General Education Requirements (see University GER 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)

1. Physics
   211/211L College Physics I & Lab ................................................. (4)
   212/212L College Physics II & Lab ................................................ (4)
   253/253L University Physics III & Lab ........................................... (4)
   (requires dept. approval to waive Calculus III)
   Or
   213/213L College Physics III & Lab ............................................... (4)
   251/251L University Physics I & Lab ............................................ (4)
   252/252L University Physics II & Lab ............................................ (4)
   253/253L University Physics III & Lab ........................................... (4)
   (requires departmental approval)

2. Chemistry
   121/121L General Chemistry I & Lab ................................................. (4)
   122/122L General Chemistry II & Lab ............................................. (4)
   333/333L Introduction to Environmental, Clinical & Forensic Analysis & Lab ........................................... (4)

3. Earth Science
   Phys 110/110L Introductory Astronomy & Lab .................................... (4)
   Geol 101/101L Introduction to Geology & Lab .................................. (4)
   Or
   Geol 102/102L The Earth Through Time & Lab ................................ (4)
   And
   Geog 121/121L Global Physical Environment & Lab ........................................... (4)
   Or
   Geog 134/134L Introduction to Global Climate & Lab ........................................... (4)

4. Biology
   Biol 150/150L General Biology I & Lab ........................................... (4)
   Biol 151/151L General Biology II & Lab .......................................... (4)
   Biol 312 Evolution ................................................................. (4)
   And
   Biol 315 Genetics ................................................................. (4)
   Or
   Biol 332/332L General Ecology & Lab ........................................... (4)
   Or
   Biol 336 Systematic Botany ....................................................... (4)

C. Minimum 8 credits of Math as follows:
   Math 165 Calculus I ............................................................... (4)
   Math 166 Calculus II .............................................................. (4)

D. Minimum of 3 semester hours of statistics selected from among the following:
   Math 321 Applied Statistical Methods ............................................ (3)
   Or
   Psyc 241 Introduction to Statistics ................................................ (4)
   Or
   Econ 210 Introduction to Business and Economic Statistics ............. (3)

IV. T&L 401, School Science Safety ............................................. (1)

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. General Education Requirements (see University GER listing).

II. The College of Education and Human Development (see EHD listing).

III. The Following Curriculum:

Hist 101 Western Civilization I .................................................... (3)
Hist 102 Western Civilization II .................................................... (3)
Hist 103 United States to 1877 ..................................................... (3)
Hist 104 United States Since 1877 ................................................. (3)
Hist 220 History of North Dakota .................................................... (3)
Hist elective 300 level or above ..................................................... (3)
Pols 115 American Government I .................................................... (3)
Pols 116 State and Local Government .............................................. (3)
Pols 220 International Politics ....................................................... (3)

Choice of one:
   Pols 305 American Constitution—Governmental Powers .................. (3)
   Pols 306 American Constitution—Civil Liberties ............................ (3)
   Pols 318 American Political Thought ............................................. (3)
   Geog 161 World Regional Geography ............................................ (3)
   Geog 282 Geography of North America ......................................... (3)
   Geog 419 Methods and Materials in Geographic Education ................. (3)

Choice of one:
   Geog 271 Map Use and Interpretations .......................................... (3)
   Geog 377 Quantitative Applications in Geog/lab ................................ (3)
   Geog 471 Cartography and Computer-Assisted Mapping/Lab ............. (3)
   Geog 474 Introduction to Geographic Information Systems ............... (3)
   Econ 201 Principles of Microeconomics ....................................... (3)
   Econ 202 Principles of Macroeconomics ...................................... (3)
   Econ 303 Money and Banking ..................................................... (3)

Choice of one:
   Econ 210 Intro to Business and Economic Statistics ....................... (3)
   Econ 330 Business and Economic History .................................... (3)
   Econ 420 Economic Education .................................................... (3)
   *Electives (6 credits in one of the following teaching areas):
   Psyc 111 Introduction to Psychology ............................................ (3)
   Psyc 360 Introduction to Personality ............................................ (3)
   Soc 110 Introduction to Sociology .............................................. (3)

Choice of one:
   Soc 306 Social Change ................................................................ (3)
   Soc 335 The Family ..................................................................... (3)
   Soc 340 Sociology of Gender and Sex Roles .................................. (3)
   Soc 361 Social Psychology .......................................................... (4)

Choice of one:
   Anth 100 Introduction to Anthropology ....................................... (3)
   Anth 171 Introduction to Cultural Anthropology ............................. (3)
   Anth 172 Introduction to Archaeology and World Prehistory ........... (3)
   Anth 300 World Prehistory .......................................................... (3)

Minor in Literacy Education (20 credits):

The Literacy Education minor is open to students majoring in a field which leads to teacher certification at the early childhood, elementary, middle or secondary level. Students must be admitted to the Teacher Education program. Students from related disciplines such as Communication Science and Disorders may also be admitted. The program consists of 20 credits, which consist of required and elective courses. The coursework meets the requirements for the North Dakota Reading Credential.

Note: T&L 335 does not count towards the minor for ECE and Elementary Education majors. T&L 335 should be taken early in the course sequence as it is a pre-requisite for more advanced reading courses.

Required Courses:

T&L 335 Understanding Readers and Writers
   (for non ECE and El Ed majors) .................................................. 3
T&L 409 Reading in the Content Areas ......................................... 3
T&L 413 Assessing & Correcting Reading Difficulties ..................... 2
T&L 414 Corrective Reading Practicum ......................................... 2
T&L 415 Language and Literacy Development of English
   Language Learners .................................................................... 3
T&L 319 Intro to ED, LD, and C/DD ............................................. 3
Minor in Special Education (20 credits)

The following two courses are required for a minor and should come before any subsequent courses:

*T&L 315 Education of the Exceptional Student .............(3)
T&L 319 Inclusive Strategies .............................................(3)

For the minor, a minimum of 14 credits may be taken from several groups of courses which are described on the Special Education website available at www.und.edu/dep/tl/spedc/. In order to obtain the credentials in special education, students will need to complete the 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

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 caring for children in the classroom. Prerequisites: Admission to Special Education. 3 credits. Corequisite: T&L 286. An overview of the early childhood education field, including an introduction to its historical roots; current trends, program models and issues; curriculum development; and typical and atypical development of young children. F

310. Introduction to Early Childhood Education. 3 credits. Prerequisite: Admission to Teacher Education, and T&L 310. 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. F,S

312. Home School 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.

313. Language Development and Emerging Literacy, 3 credits. Prerequisite: Admission to Teacher Education. 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. F,S

314. Social and Emotional Development and Guidance of Children, 3 credits. This course examines both typical and atypical social and emotional development in children ages birth-8 as well as factors influencing children’s development and functioning with children in educational settings. The course will also focus on child guidance and behavior issues affecting classroom climate. S

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

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 disorders. The course includes an introduction to the general education classroom. Instructional approaches and service delivery models within the general education classroom will also be explored. F,S

320. Infants/Toddler Dev and Learning, 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 measuring them in the children’s home and community environments. S

325. Exploring Teaching in Secondary Schools, 3 credits. Prerequisite: Sophomore status (at least 30 credits). This course is designed for students exploring the profession of teaching in a secondary or middle school as a viable career choice for them. A classroom field experience is included in this course to provide the realities of the profession in making an informed decision. As an integral part of the Secondary Education Program Area, this course introduces students to the INTASC Principles which guide our preparation of teachers and the Portfolio Process, the program’s assessment tool. This course is also taken by students preparing for K-12 or middle school licensure. F,S

328. Survey of Children’s Literature, 3 credits. Prerequisite: Admission to the Teacher Education program. 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. F,S

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.

330. Introduction to Teaching and Learning, 3 credits. Prerequisite: Admission to the study of education. The course explores how children differ, how society and schools respond to children’s differences, and how the social and political contexts of schooling affect children’s education. Students have the opportunity to visit schools, view films and video related to education, to explore children’s literature, and to participate in role-playing, simulations, and peer teaching. F,S

335. Understanding Readers and Writers, 3 credits. Prerequisite: Admission to the Teacher Education program. This foundational course explores the developmental nature of reading and writing, the reading and writing processes, and the skills and strategies for successful literacy learning. Holistic methods for assessing literacy are studied to understand individual language learners. F,S

345. Curriculum Development and Instruction, 3 credits. Prerequisites: T&L 325 and admission to teacher education. 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, implementing 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. F,S

350. Development and Education of the Adolescent, 3 credits. Prerequisites: T&L 325 and admission to teacher education. 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, physical 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. F,S

386. Field Experience, 1 credit. Prerequisites: T&L 325 and admission to the professional program. Supervised tutor or apprentice teaching, experience in an early childhood, K-12 classroom, university or community setting approved by the program area. Optional, SU grading. F,S

390. Special Topics, 1-3 credits. May be repeated. *Other approved courses may meet this requirement. Prerequisite: admission to teacher education.

400. Methods and Materials, 3 credits. Prerequisites: T&L 325, 345 and admission to teacher education. Corequisite: T&L 486. Various teaching methods and strategies and the materials used in teaching in a subject area. Some offered F only; some S.F. See adviser. (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.)

401. School Science Safety, 1 credit. Corequisite: T&L 400. 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 classes, including environmental, biological safety, physical safety, and disposal, legal issues, liability reduction and cost control are also addressed in detail. F

409. Reading in the Content Areas, 3 credits. This course addresses issues of using text, expository and narrative, within the content areas, i.e., science, social studies, writing within the content area and across the curriculum are investigated. S


411. Primary Reading and Language Arts, 2 credits. Prerequisites: Admission to Teacher Education, T&L 335. Pre- or corequisite: T&L 328. 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. F,S

412. Intermediate Language Arts, 2 credits. Prerequisites: Admission to Teacher Education, T&L 335. Pre- or corequisite: T&L 328 or 329. This course explores a wide variety of approaches to teaching reading and language arts to intermediate level children. Emphasis is placed on the synergistic reading and writing and multiple ways of using language for creative and personal expression, integrating the language arts across the curriculum, spelling, vocabulary development and critical literacy. F,S

413. Assessing and Correcting Reading Difficulties, 2 credits. Prerequisite: Admission to Teacher Education, T&L 335. The Correlation of Methods and Practice (T&L 414) is required as corequisite with T&L 413. The focus of this course and practicum is to learn about current approaches to assessment and methods to assist students who are
in a cooperative environment and involves participants in projects and activities that develop conceptual understanding. F

451. Methods and Materials: Pre-Kindergarten. 3 credits. Prerequisite: T&L 310 and admission to Teacher Education. 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. There will be a minimum of eight (8) hours of activities in the field. F

453. Methods and Materials: Kindergarten. 2 credits. Prerequisite: T&L 310, 312, 313, 314 and admission to Teacher Education. Exploration of curriculum, methods, and materials for use in kindergarten educational settings. Supervised tutorial or apprentice teaching experience. F

454. Organization and Leadership in Early Childhood Education. 2 credits. Prerequisite: Admission to Teacher Education or graduate. An investigation of projects of administration, curriculum organization, spatial resources, and staffing in those early childhood settings serving children 0-8 years old. Topics will also 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 (shadowing a director/administrator) as a part of the class. S

456. Early Childhood Education Seminar. 1 credit. Prerequisite: T&L 451 and admission to Teacher Education. Corequisite: T&L 487. Taken in conjunction with pre-kindergarten student teaching. This seminar continues the exploration of curriculum, methods, and materials issues as they are presented in the particulars of the student teaching experience. F

460. Microteaching. 3 credits. Prerequisites: T&L 325, 345 and admission to teacher education. The focus of this course is to apply the educational theories learned in the foundational courses to pedagogy through peer teaching, field-based experience, group interaction, video-taped presentations, related readings and other activities. The course emphasizes the continuing development of instructional planning, multiple instructional strategies, accommodations for diverse and special needs learners, and assessment of student learning within the context of knowledge of subject matter and adolescent development. Students should take this course the semester before student teaching. Regular grading. F,S

465. Middle Level Curriculum and Methods. 5 credits. Prerequisite: T&L 341. Corequisite: T&L 406. 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. S

470. Science in the Elementary School (TEAM). 3 credits. Prerequisites for elementary and early childhood education majors: Admission to Teacher Education; grade of C or better in the following courses: T&L 300, 315, 328 or 329, 335, Math 103 or equivalent, and Math 277; GPA of 2.75 or better. Prerequisites also include Art 460, Music 243, 443 or 449, and PEX 300. Prerequisites for early childhood education majors: Admission to Teacher Education; grade of C or better in the following courses: T&L 310/486, 315, 328, 335 and 443; and GPA of 2.75 in the Early Childhood major. Corequisites: T&L 410, 440, 470, 486. 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. F

472. Teaching Life Sciences in the Elementary School. 2 credits. Hands-on approach to learning basic physical science topics such as electricity, sound, light, and force. Effective teaching strategies are also emphasized. F

473. Earth and Space Science. 2 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. S

486. Field Experience. 1-4 credits. (Repeatable to 16). Prerequisites for elementary education majors: Admission to Teacher Education; grade of C or better in the following courses: T&L 300, 315, 328 or 329, 335, Math 103 or equivalent, and Math 277; GPA of 2.75 or better. Prerequisites also include Art 460, Music 243, 443 or 449, and PEX 300. 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. F,S

487. Student Teaching. 4-16 credits. If repeated, Student Teaching would be taken in a different program area. Prerequisite: Permission of program. 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. S/U grading. F,S

488. Senior Seminar. 1 credit. S/U grading only. A discussion of problems, professional obligations, and careers in teaching. To be taken concurrently with or the semester prior to student teaching. F

493. Workshop. 2-5 credits. (May be repeated to a total of 8 credits.) Special problems in Special Education; consideration of special problems of concern to the Special Education teacher and other educators. F,S

495. Independent Study. 1-4 credits, repeatable to 10. This course is designed for the interested student with the same basic goal of achieving a new concept of the subject. Students engaged in this course are responsible for planning and organizing of academic work and appropriate classroom activities and lessons. S

498. Special Projects. 1-8 credits. Course number reserved for committee approved proposals, independent study, special colloquia, or experimental courses.

having difficulty with reading and writing. Observations, running records, interviews, and others' evaluation is used to learn about readers and writers, and these assessments are used to plan for instruction. SS

414. Corrective Reading Practicum. 2 credits. Prerequisite: Admission to Teacher Education; T&L 335. Corequisite to T&L 413. Applying the knowledge and skills learned in T&L 413 and in this practicum assessment, plan for and teach children who are having difficulty with reading and/or writing. SS

415. Language and Literacy Development of English Language Learners (ELLs). 3 credits. This course addresses the foundations of teaching English language and literacy to ELLs and includes study of various approaches to ELL instruction, methods of instruction, assessment of English language proficiency and development, and increasing the comprehensibility of academic content. S

421. Transition to Adult Life. 3 credits. The study of methods, curriculum, and assessment needed to create the successful adult life for persons with disabilities. Topics include interagency cooperation, transition program planning and development, career awareness and development, and assessment of adaptive living skills. S

422. Essentials 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

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. F,S

425. 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. F

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,S

430. Social Studies in the Elementary School (TEAM). 3 credits. Prerequisites for elementary education majors: Admission to Teacher Education; grade of C or better in the following courses: T&L 330, 315, 328 or 329, 335, Math 103 or equivalent, and Math 277; GPA of 2.75 or better. Prerequisites also include Art 460, Music 243, 443 or 449, and PEX 300. Prerequisites for early childhood education majors: Admission to Teacher Education; grade of C or better in the following courses: T&L 310/486, 315, 328, 335 and 443; and GPA of 2.75 in the Early Childhood major. Corequisites: T&L 410, 440, 470, 486. 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. F

432. Classroom Management. 3 credits. Prerequisite: Admission to Teacher Education. The purpose of this class is to study factors that influence classroom behavior and examine a variety of techniques that can be used in planning for positive classroom management. This course views classroom management from a humanistic position but does not assume a single method as the "best" approach. Students are expected to develop their own eclectic style during the course of this class. F,S,SS

433. Multicultural Education. 3 credits. Prerequisite: Admission to Teacher Education. This course is designed as an anthropological and multicultural course to 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. F,S,SS

435. How Children Learn. 3 credits. How Children Learn is designed to investigate the dynamics of learning. The course will focus on ideas, research findings, issues and theories, as well as examining the effects of motivation, self-concept, social-ethnic concerns, group dynamics, teacher expectations, and other relevant issues. The focus is on the understanding, meaning, and experiences involved in growth, teaching, and learning. F

440. Math in the Elementary School (TEAM). 3 credits. Prerequisites for elementary education majors: Admission to Teacher Education; grade of C or better in the following courses. T&L 330, 315, 328 or 329, 335, Math 103 or equivalent, and Math 277; GPA of 2.75 or better. Prerequisites also include Art 460, Music 243, 443 or 449, and PEX 300. Corequisites: T&L 410, 430, 470, and 486. TEAM Math is the required mathematics methods course for all undergraduate elementary education majors. 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. F,S

443. Math for Primary Grades. 2 credits. Prerequisite: admission to Teacher Education. 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. F

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
Technology (IT)
Diez, Huang, Johnson, Kenney and Yearwood (Chair)

The Department of Technology has programs accredited by the National Association of Industrial Technology (NAIT) and National Council for Accreditation of Teacher Education (NCATE). Program offerings include four-year undergraduate Bachelor of Science (B.S.) degree programs and a graduate program leading to the Master of Science degree (thesis and non-thesis options). The undergraduate degree programs offered through the College of Business and Public Administration are Bachelor of Science in Industrial Technology (BSIT), Industrial Management (NAIT accredited), Bachelor of Science in Industrial Technology (BSIT) with Teacher Certification (NCATE accredited), and Bachelor of Science in Occupational Safety and Environmental Health (BSOSEH) and Bachelor of Science in Graphic Design Technology (BSGDT). Minors in manufacturing, electronics, and graphic communication are an integral part of department offerings.

College of Business and Public Administration

B.S. GRAPHIC DESIGN TECHNOLOGY (GDT)

DEGREE PROGRAM

The Graphic Design Technology program is an innovative, multidisciplinary major that integrates courses drawn from various academic departments. The major includes a significant business component—the Entrepreneurship Studies Certificate program—which is unique in comparison to all other graphic design programs in this region and most graphic design programs nationally. The Graphic Design Technology program combines theory and practice, and application and production in a liberal arts context giving students a solid university education. It provides students majoring in Graphic Design Technology with a diverse range of learning experiences and opportunities in a flexible, technology-rich environment.

Throughout this program students learn to plan, analyze, and create solutions to visual communication problems. They consider cognitive, cultural, physical, economic, political, psychological and social factors in planning and executing graphic designs appropriate for a given context. Students use a variety of print, electronic, and photographic media and technologies during the design process. The professional Graphic Design Technology program prepares students for an array of exciting careers in business, government, industry and education.

Required 125 credit hours, and including:

I. General Education Requirements, see University GER 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.

A. Technology Requirements (41 Credit Hours Required)
   IT 110 .......... Principles of Industrial Technology ........................................ (2)
   IT 122 .......... Computer Aided Design & Drafting .................................... (3)
   IT 201 .......... Technical Drawing ............................................................. (3)
   IT 202 .......... Technical Drawing ............................................................. (3)
   IT 212 .......... Principles of Graphic Design and Print Production .............. (3)
   IT 300 .......... Technology and Society .................................................... (3)
   IT 302 .......... Web Page Design ............................................................. (3)
   IT 322 .......... Fundamentals of Photography ............................................ (3)
   IT 332 .......... 3D Design ........................................................................ (3)
   IT 422 .......... Digital Photography & Imaging ........................................... (3)
   IT 442 .......... Desktop Publishing ............................................................ (3)
   IT 450 .......... Senior Capstone ................................................................. (3)
   IT 452 .......... Multimedia Production ....................................................... (3)
   IT 497 .......... Directed Studies in Technology ............................................ (8)

B. Entrepreneur Requirements (16 Credit Hours Required)
   ENTR 200 .......... Concept Generation & Technology Entr ........................ (1)
   ENTR 201 .......... The Entrepreneur and the Economy ............................... (3)
   ENTR 301 .......... Accounting and Financial Concepts for Entr .................... (3)
   ENTR 302 .......... Marketing and Management Concepts for Entr ............... (3)
   ENTR 385 .......... Venture Initiation ............................................................. (3)
   ENTR 387 .......... Venture Growth .............................................................. (3)

C. Support Recommendations (29 Credit Hours Recommended)
   IT 397 .......... Cooperative Education in Technology ............................... (3)
   IT 493 .......... Workshop ........................................................................ (9)

**Complimentary Courses in Other Disciplines .............................. (17)
**Contact the Technology Department for a list of recommended courses.

B.S. INDUSTRIAL TECHNOLOGY (IT)

DEGREE PROGRAM

Industrial Technology is a field of study designed to prepare technical/management-oriented professionals for employment in business, industry, and government. The curriculum is organized into three integrated technology areas: Electronics and Control, Graphic Communication, and Manufacturing.

Required 125 credit hours, and including:

I. General Education Requirements, see University GER 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:

A. Technical Foundation Requirements (17 Credit Hours Required)
   IT 110 .......... Principles of Industrial Technology ........................................ (2)
   IT 122 .......... Computer Aided Design & Drafting .................................... (3)
   IT 201 .......... Technical Drawing ............................................................. (3)
   IT 202 .......... Technical Drawing ............................................................. (3)
   IT 203 .......... Production Processes: Manufacturing ................................... (3)
   IT 212 .......... Principles of Graphic Design and Print Production .............. (3)

B. Management Foundation Requirements (21 Credit Hours Required)
   IT 300 .......... Technology and Society .................................................... (3)
   IT 330 .......... Quality Assurance ............................................................... (3)
   IT 340 .......... Cost Estimating ................................................................. (3)
   IT 420 .......... Facilities Design ................................................................. (3)
   IT 433 .......... Manufacturing Strategies .................................................. (3)
   OSEH 440 .......... Industrial Safety .......................................................... (3)
   IT 450 .......... Senior Capstone ................................................................. (3)

IV. Selected Electives for Industrial Technology Majors
(18 Credit Hours)

Emphasis may be chosen from the following Technology Systems areas; however, a minimum of one course having each of the third digit 1, 2, and 3 must be included.

Electronics and Control Technology
   IT 211 .......... Electric Circuits and Devices ............................................... (3)
   IT 301 .......... Microelectronic Circuits ..................................................... (3)
   IT 311 .......... Microcomputer Hardware .................................................. (3)
   IT 341 .......... Digital Integrated Circuits ................................................... (3)
   IT 411 .......... Integrated Mechanical Fluid Systems .................................. (3)
   IT 451 .......... Control Systems ................................................................. (3)

Graphic Communication Technology
   IT 202 .......... Web Page Design ............................................................. (3)
   IT 322 .......... Fundamentals of Photography ............................................ (3)
   IT 332 .......... 3D Design ........................................................................ (3)
   IT 422 .......... Digital Photography & Imaging ........................................... (3)
   IT 442 .......... Desktop Publishing ............................................................ (3)
   IT 452 .......... Multimedia Production ....................................................... (3)

Manufacturing Technology
   IT 204 .......... Industrial Materials .......................................................... (3)
   IT 213 .......... Production Processes: Construction .................................... (3)
   IT 223 .......... Applied Synthetics ............................................................. (3)
   IT 373 .......... Manufacturing Automation Systems .................................... (3)
   IT 403 .......... Product Research & Development ..................................... (3)

General Major Electives
   IT 397 .......... Cooperative Education in Industrial Technology ............... (3)
   IT 404 .......... Materials Testing ............................................................... (3)
   IT 412 .......... Design/Drafting ................................................................. (3)
   IT 493 .......... Workshop ........................................................................ (1-6)
   IT 497 .......... Directed Studies in Industrial Technology .......................... (1-4)

V. Required Support Courses: Select from the following or higher level (36 hours minimum)

ISYS 117 .......... Personal Productivity with Information Technology ........... (1)
Math 103 .......... College Algebra ............................................................... (3)
Math 105 .......... Trigonometry ................................................................. (2)
Math 146/165 .......... Applied Calc/Calc I ..................................................... (3-4)
Chem 121/121L .......... General Chemistry I ............................................... (4)
Phys 161/161L .......... Introduction to College Physics ............................... (4)
Phys 162/162L .......... Introduction to College Physics ............................... (4)
Econ 210 .......... Introduction to Business & Economic Statistics ............... (3)
Mgmt 300 .......... Principles of Management ............................................. (3)
Mgmt 301 .......... Production Management ................................................ (3)
Mgmt 302 .......... Human Resources Management .................................... (3)
And Either
   Mrkt 305 .......... Marketing Foundations ................................................ (3)
or
   Phil 370 .......... Ethics in Engineering and Science .................................... (3)
Students are encouraged to apply for the Certified Industrial Technologist (CIT), offered by the National Association of Industrial Technology (NAIT). Those in Manufacturing and Electronics & Control Technology are requested to take the Certified Manufacturing Technology (CMfgT) examination, conducted by the Society of Manufacturing Engineers (SME) or the Certified Quality Technician examination, conducted by American Society of Quality Control (ASQC).

B.S. INDUSTRIAL TECHNOLOGY (IT)

Technology Teacher Certification

Students preparing for a career in technology teacher education will complete the following coursework with teacher certification preparation through the College of Education and Human Development.

Required 125 credit hours, and including:

I. General Education Requirements, see University GER listing.

II. The College of Business and Public Administration GPA Graduation Requirement (2.50), see College section.

III. Technology Teacher Certification Major Program Requirements: At least a 2.75 GPA in courses that apply toward the major, and the following:

A. Technical Foundation Requirements (17 Credit Hours Required)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 110</td>
<td>Principles of Industrial Technology</td>
<td>(2)</td>
</tr>
<tr>
<td>IT 122</td>
<td>Computer Aided Design/Drafting</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 201</td>
<td>Electromechanical Fundamentals</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 202</td>
<td>Technical Drawing</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 203</td>
<td>Production Processes: Manufacturing</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 212</td>
<td>Principles of Graphic Design and Print Production</td>
<td>(3)</td>
</tr>
</tbody>
</table>

B. Teacher Certification Foundation Requirements (21 Credit Hours Required)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 300</td>
<td>Technology and Society</td>
<td>(3)</td>
</tr>
</tbody>
</table>

The teacher certification program offers students an opportunity to major in Industrial Technology and complete the Secondary Education program of the Department of Teaching and Learning (see the Teaching and Learning section). Successful completion of the requirements for both programs qualifies the student for teacher certification in Technology Education. Successful completion of the BSTT Selected Electives section IV requirements must include the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 211</td>
<td>Electric Circuits and Devices</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 212</td>
<td>Principles of Graphic Design and Print Production</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 204</td>
<td>Industrial Materials</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 213</td>
<td>Production Processes: Construction</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 205</td>
<td>Applied Synthetics</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 400</td>
<td>Teaching Technology Education</td>
<td>(3)</td>
</tr>
</tbody>
</table>

IV. Selected Electives for Industrial Technology Majors (3 credit hours)

Courses may be chosen from the following Technology Systems areas; however, a minimum of one course having each of the third digit 1, 2, and 3 must be included.

Electronics and Control Technology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 211</td>
<td>Electric Circuits and Devices</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 301</td>
<td>Microelectronic Circuits</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 311</td>
<td>Microcomputer Hardware</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 341</td>
<td>Digital Integrated Circuits</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 411</td>
<td>Integrated Mechanical Fluids Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 451</td>
<td>Control Systems</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Graphic Communication Technology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 302</td>
<td>Web Page Design</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 322</td>
<td>Fundamentals of Photography</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 332</td>
<td>3D Design</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 422</td>
<td>Digital Photography &amp; Imaging</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 442</td>
<td>Desktop Publishing</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 452</td>
<td>Multimedia Production</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Manufacturing Technology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 204</td>
<td>Industrial Materials</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 213</td>
<td>Production Processes: Construction</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 322</td>
<td>Applied Synthetics</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 373</td>
<td>Manufacturing Automation Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 403</td>
<td>Product Research &amp; Development</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Industrial Technology General Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 397</td>
<td>Cooperative Education in Industrial Technology</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 401</td>
<td>Materials Testing</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 412</td>
<td>Design/Drafting</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 493</td>
<td>Workshop</td>
<td>(1-6)</td>
</tr>
<tr>
<td>IT 497</td>
<td>Directed Studies in Industrial Technology</td>
<td>(1-4)</td>
</tr>
</tbody>
</table>

V. Teacher Certification

Students preparing for a career in technology teacher education will complete the following coursework in addition to the BSTT coursework listed in IV above.

Secondary Teacher Certification Requirements

29 credits minimum, see Teaching and Learning section. Formal admission to Teacher Education is required and is normally sought while enrolled in T&L 325 and requires a minimum of 2.75 GPA. To be accepted for student teaching, a student must have a 2.75 in the major field of study and a 2.75 GPA in all coursework attempted prior to applying for student teaching. Industrial Technology majors seeking teacher certification must have an adviser from the Department of Industrial Technology and the Department of Teaching and Learning.

Secondary Education Certification Preparation Sequence

Pre-admission:

T&L 325 Exploring Teaching in Secondary Schools (3)

Admission to Teacher Education is required for enrollment in all of the following courses:

T&L 345, Curriculum Development and Instruction (5)

T&L 390, Special Topics (2-3)

T&L 350, Development & Education of the Adolescent (3)

T&L 386*, Field Experience, elective (1)

T&L 400, Methods and Materials (IT 400) (3)

T&L 433, Multicultural Education (3)

T&L 460, Microteaching (2)

T&L 486, Field Experience (3)

T&L 495**, Independent Study/Secondary Education (1-2)

T&L 487**, Student Teaching (16)

T&L 488**, Senior Seminar (1)

MINORS IN INDUSTRIAL TECHNOLOGY:

Electronics and Control Technology, Graphic Communication Technology, Manufacturing Technology

Twenty-three (23) credits to be selected as follows:

Eight (8) credits from the Required Core:

IT 110: Principles of Industrial Technology

IT 122: Computer Aided Design/Drafting

IT 300: Technology and Society

15 credits to be selected from the following Technology Areas:

Electronics and Control Technology: 15 credits to be selected from course work ending in 1, i.e., 201, 211, etc.

Manufacturing Technology: 15 credits to be selected from course work ending in 2, i.e., 212, 302, etc.

Courses

110. Principles of Industrial Technology, 2 credits. The study of the philosophy and objectives of Industrial Technology with emphasis on the theories, principles, and objectives of technological systems in business, industry, and educational institutions.

122. Computer Aided Design/Drafting, 3 credits. This course introduces the student to computer aided design/drafting with AutoCAD. It is a combination of lecture, hands on exercises and drawing problems used in industry and business.

201. Electromechanical Fundamentals, 3 credits. Prerequisites: Math 103; Co-require: Phy 101. The study of fundamental mechanical, hydraulic, pneumatic, and electrical apparatus used in power systems.

202. Technical Drawing, 3 credits. Prerequisite: IT 122. The study of technical drawing techniques to include various projections, pictorials, dimensioning, developments and tolerancing used in business and industry.

204. Industrial Materials, 3 credits. The study of the characteristics, structure, properties and physical nature of organic and inorganic materials for industrial conversion processing; to include wood, metals, ceramics, polymers, and ceramics laboratory activities.

213. Electric Circuits and Devices, 3 credits. Prerequisites: IT 201 and Math 103 and 105. Concepts, principles, and operational characteristics of electric components and circuits. Hands-on operation and experiments of electric devices and equipment.

212. Principles of Graphic Design and Print Production, 3 credits. Basic concepts, processes, and techniques involved in design image generation and image reproduction for the graphic arts.
213. Production Processes: Construction. 3 credits. Prerequisite: IT 110 or 204 or consent of instructor. A study of material processing methods and techniques utilizing tools and machines leading to the production of constructed assemblies. F/2

223. Applied Synthetics. 3 credits. Prerequisite: Chem 115/115L or 121/121L. A study of synthetic/polymer materials emphasizing identification of characteristics and properties; and their application as related to industrial products. S

300. Technology and Society. 3 credits. A lecture-recitation course covering the various impacts of technology on the individual, society, environment and basic institutions. Technological matrix of various cultures. F, S

301. Microelectronic Circuits. 3 credits. Study of electronic components and circuits (discrete and integrated) and their functional and operational characteristics. F

302. Web Page Design. 3 credits. Prerequisite: IT 212. Introduction to electronic publishing on the Internet through design, layout and production of web pages. Emphasis on the use of graphic design software, interface design, navigation, etc. F

310. Microcomputer Hardware. 3 credits. Prerequisite: IT 201 or consent of instructor. An introductory course to microcomputer hardware maintenance that presents the full scope and understanding of how computers should function and be managed. This course includes in-depth understanding of microcomputer components, troubleshooting, diagnostic procedures, and upgrading. Course concludes with descriptions of third party systems and how emerging trends in microcomputer configuration impact the maintenance function. F

322. Fundamentals of Photography. 3 credits. Introduction to the concepts, processes, technologies, and application of film and digital photography. The course consists of lecture, discussion and laboratory activities. F, SS

330. Quality Assurance. 3 credits. Prerequisite: Econ 210 or consent of instructor. Theoretical and laboratory study of industrial quality control methods, instrument and systems measurement techniques, and data handling procedures. F

332. 3D Design. 3 credits. Through a combination of lecture, hands-on exercises, and design assignments, this course introduces the student to the 3D features of AutoCAD. Topics covered include: 3D coordinants and layout, surface meshes, regions, and solid modeling. The creation of presentation graphics using bitmap files, shading, and rendering is also discussed. S

340. Cost Estimating. 3 credits. Prerequisites: Econ 210, Math 146, or equivalent or consent of instructor. Principles and techniques necessary for the economic analysis and evaluation of industrial design projects. S

341. Digital Integrated Circuits. 3 credits. Prerequisites: IT 211 or consent of instructor. The study of basic concepts of digital circuits and devices; operational characteristics of digital integrated circuits. S

373. Manufacturing Automation Systems. 3 credits. Prerequisites: IT 201, 203 and 122 or equivalent. The study of the fundamentals of automation as it relates to automated production environments. Students will examine the forms of computer-based automation systems used in the various areas of a manufacturing system and how systems can be integrated through data communication networks. Topics include CNC and CNC programming and systems, computer assisted parts programming, industrial robot configurations, automation, industrial automation applications, and integration of control systems and manufacturing technology. F

397. Cooperative Education. 1-6 credits. Prerequisites: Junior standing; 2.5 overall GPA, and faculty approval. A practical work experience with approved industrial enterprises arranged by the student, faculty and employer. Repeatable to 6 credits. S/U grading. F, S, SS

400. Teaching Technology Education. 3 credits. Prerequisite: Junior standing and consent of instructor. An analysis of various methods employed in instructional technology for industry and education. Development of methods and strategies of instruction use and ordering of instructional materials, based on behavioral objectives and classroom application of instructional techniques; lab activities. F/2

403. Product Research and Development. 3 credits. Prerequisite: IT 203 or consent of instructor. The study of product development and production planning for manufacture through the application of research methodologies, design processes, and prototype development. F

404. Materials Testing. 3 credits. Prerequisites: IT 201, 202, 203, 212, Chem 121 and 121L or equivalent. Methods by which properties (i.e., physical, mechanical, thermal, electrical, optical, and chemical) of industrial materials are tested for determination of applications. F/2

411. Integrated Mechanical Fluid Systems. 3 credits. Prerequisite: IT 201. This course focuses on modern mechanical fluid power systems including laws of mechanics, components, circuits, and instrumentation. Laboratory activities will emphasize the control and utilization of fluid systems through mathematical problem solution, fluid system design, and simulation software. S/2

412. Design/Drafting. 3 credits. Prerequisite: IT 212 or consent of instructor. The application of design and drafting techniques for the design of tools, machines and products. F/2

420. Facilities Design. 3 credits. Prerequisite: IT 122. Principles and applications of the design of commercial and institutional space. Emphasis on site location, environmental considereation, qualitative and quantitative modeling. Computer application in facility planning and quantitative analysis; lab activities. S

422. Digital Photography and Imaging. 3 credits. Prerequisites: IT 322 or consent of instructor. This advanced course in photography focuses on the concepts, processes, technologies and applications of digital photography and imaging. It includes the utilization of cameras, digitizing technologies, and computer software designed specifically for creating, processing and editing images. Topics include this technology’s history, ethics, legal, and regulatory issues, creative and scientific processes, and applications. F

433. Manufacturing Strategies. 3 credits. Prerequisites: IT 203 and 122 or equivalent. 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. S

442. Desktop Publishing. 3 credits. Prerequisite: IT 212 or consent of instructor. An integrated graphic design course that provides a broad understanding of computer-assisted publishing. Emphases are on design and print production, materials, processes, analyses, and technologies of desktop publishing. S

450. Senior Capstone. 3 credits. Prerequisite: Senior standing and consent of instructor. The capstone course is designed to integrate coursework covered throughout the student’s program in order to demonstrate knowledge and understanding related to the theories, processes, methods and techniques in their area of emphasis. Students will work individually and collaboratively to demonstrate their overall competency in program objectives and their potential as professionals. S

451. Control Systems. 3 credits. Prerequisite: IT 211. A study of computer integrated systems and their designs as utilized by industry to facilitate the manufacturing and production processes. Subject matter to be covered includes, but is not limited to, Programmable Logic Controllers (PLCs), microcontrollers and robots. Students will also utilize commercial computer-aided design tools, i.e., Multism and Ultiboard to design, test, and manufacture their own circuit boards where necessary. S/2

452. Multimedia Production. 3 credits. Prerequisites: IT 302 or consent of instructor. 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 together to create compelling productions. S

493. Workshop. 1-6 credits. A workshop course on a specific topic, primarily for, but not confined to, Continuing Education. F, S, SS

497. Directed Studies in Industrial Technology. 1-8 credits. Prerequisites: Junior standing and instructor consent. Studies in topics pertinent to the students’ needs in selected specialities including (a) Toolroom Technology, (b) Basic and Control Technology, (c) Graphic Communication Technology, (d) Manufacturing Technology, and (e) Materials Science. F, S

Theatre Arts

Burgess, Cutler, Lyons, McLennan (Chair), Reissig and Williams

The mission of the Department of Theatre Arts is to achieve the following: 1) empower students to discover and fulfill their own potential as artists for the enrichment of the global community; 2) engage in a dialogue of ideas about the complex human condition through research, scholarship, and creative work within the campus community and throughout the world; and 3) develop in students a sense of social responsibility and arts advocacy through service to the community, region, and state.

The Department of Theatre Arts strives to promote integration of the creative arts for the campus, community and region by fostering a climate of creativity and cultural enrichment, and instilling an appreciation and understanding of theatre and drama in our students, faculty and the community. While serving the university academically and culturally, the theatre offers diverse practical and aesthetic assets whether the student has professional or non-professional aspirations. Participation and training in theatre arts leads the student to an understanding of the creative process in the performance and the technical areas of the theatre arts.

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, a Bachelor of Arts, or a Minor. The Department offers a Master of Arts degree at the graduate level (see Graduate section 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 Performance is a pre-professional acting degree that requires a higher level of proficiency in theatrical performance and is an appropriate preparation for students who desire acting careers.

The Department of Theatre Arts integrates the classroom curriculum with applied, experiential learning in production. Our pro-
duction season offers a rich variety of styles and genres, including musicals. Student directors and designers may apply to stage a production in the Studio 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, a set-construction shop, a costume shop, and a 100-seat Studio 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.

The Bachelor of Fine Arts in Performance 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 program must submit an application spring semester of their sophomore year to the chairperson who will then schedule an audition and personal interview for the candidate with the Theatre Arts faculty. BFA applications are generally accepted in March with screening held in April. Upon acceptance, the student will be assigned to the BFA faculty adviser. Each student will be reviewed annually by Theatre Arts faculty who will make a recommendation concerning the student’s status in the BFA program based on the student’s performance in classes and in production activities. If probation is recommended, students may apply for readmission at the completion of a full semester of satisfactory work. Readmission will be contingent upon faculty evaluation.

As part of the department’s outcomes assessment plan, all Theatre Arts majors are required to complete an exit interview, an attitude survey upon entrance to and completion of the degree, along with various other assessment tools beyond those specifically listed for BFA students. For complete information concerning outcomes assessment in Theatre Arts, consult the departmental chairperson.

**College of Arts and Sciences**

**B.F.A. IN PERFORMANCE 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. General Education Requirements (see University GER listing). 39 credit hours.

II. The Following Curriculum:

A. Core I (courses normally taken during the first year of study): 19 credits

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thea 122</td>
<td>Makeup for Theatre and Television</td>
<td>1</td>
</tr>
<tr>
<td>Thea 130</td>
<td>The Art and Craft of Theatre</td>
<td>3</td>
</tr>
<tr>
<td>Thea 161</td>
<td>Acting I</td>
<td>3</td>
</tr>
<tr>
<td>Thea 201</td>
<td>Theatre Practicum</td>
<td>3</td>
</tr>
<tr>
<td>Thea 226</td>
<td>Intro to Design</td>
<td>3</td>
</tr>
<tr>
<td>Thea 250</td>
<td>Readings in Dramatic Literature</td>
<td>3</td>
</tr>
<tr>
<td>Thea 270</td>
<td>Stagecraft</td>
<td>3</td>
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</table>

B. Core II (courses normally taken during the second year of study): 18 credits

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Thea 230</td>
<td>Text Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Thea 300</td>
<td>Play Direction I</td>
<td>3</td>
</tr>
<tr>
<td>Thea 330</td>
<td>Contemporary Theatre</td>
<td>3</td>
</tr>
<tr>
<td>Engl 315/316</td>
<td>Shakespeare</td>
<td>3</td>
</tr>
<tr>
<td>Thea 423</td>
<td>History of the Theatre: Classical, Medieval, Renaissance</td>
<td>3</td>
</tr>
<tr>
<td>Thea 424</td>
<td>History of the Theatre: 17th Century to the Present</td>
<td>3</td>
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</tbody>
</table>

C. Acting, Voice, and Movement Sequences: 31 credits

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>Thea 120</td>
<td>Voice and Movement I</td>
<td>2</td>
</tr>
<tr>
<td>Thea 162</td>
<td>Introductory Acting II</td>
<td>3</td>
</tr>
<tr>
<td>Thea 220</td>
<td>Voice and Movement II</td>
<td>2</td>
</tr>
<tr>
<td>Thea 271</td>
<td>Intermediate Acting I</td>
<td>3</td>
</tr>
<tr>
<td>Thea 272</td>
<td>Intermediate Acting II</td>
<td>3</td>
</tr>
<tr>
<td>Thea 320</td>
<td>Voice and Movement III</td>
<td>2</td>
</tr>
<tr>
<td>Thea 371</td>
<td>Advanced Acting I</td>
<td>3</td>
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<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>Thea 471</td>
<td>Advanced Acting III</td>
<td>3</td>
</tr>
<tr>
<td>Thea 481</td>
<td>Theatre Practicum</td>
<td>1</td>
</tr>
<tr>
<td>Thea 494</td>
<td>Senior Project</td>
<td>4</td>
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</table>

D. Electives: 12 credits from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>Thea 222</td>
<td>Advanced Makeup</td>
<td>3</td>
</tr>
<tr>
<td>Thea 229</td>
<td>Creative Dramatics (on demand)</td>
<td>3</td>
</tr>
<tr>
<td>Thea 325</td>
<td>Stagecraft</td>
<td>3</td>
</tr>
<tr>
<td>Thea 326</td>
<td>Lighting 1</td>
<td>2</td>
</tr>
<tr>
<td>Thea 339</td>
<td>Production Design</td>
<td>3</td>
</tr>
<tr>
<td>Thea 404</td>
<td>Acting for the Music Theatre</td>
<td>3</td>
</tr>
<tr>
<td>Thea 425</td>
<td>Directing II</td>
<td>3</td>
</tr>
<tr>
<td>Thea 426</td>
<td>Scene Design</td>
<td>3</td>
</tr>
<tr>
<td>Thea 427</td>
<td>Costume Design</td>
<td>3</td>
</tr>
</tbody>
</table>

**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. General Education Requirements (see University GER listing).

II. Level II proficiency in a foreign language.

III. 8 additional hours in the same or a second foreign language or 8 additional hours in a cognate area: courses to be approved by adviser (suggested cognate course topics include: Women’s Studies, Minority Studies, Anthropology, English, Psychology, Computer Science, Indian Studies, Peace Studies, Music, Communication, Visual Arts, etc.)

IV. The following curriculum:

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<td>Thea 325</td>
<td>Stagecraft</td>
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<td>Thea 326</td>
<td>Lighting 1</td>
<td>2</td>
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<tr>
<td>Thea 425</td>
<td>Play Direction II</td>
<td>3</td>
</tr>
<tr>
<td>Thea 427</td>
<td>Costume Design</td>
<td>3</td>
</tr>
<tr>
<td>Thea 481</td>
<td>Theatre Practicum</td>
<td>1</td>
</tr>
<tr>
<td>Thea 488</td>
<td>Playwriting</td>
<td>3</td>
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</table>

**MINOR IN THEATRE ARTS**

Required 23 credits, including:

<table>
<thead>
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<tr>
<td>Thea 130</td>
<td>The Art and Craft of Theatre</td>
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<tr>
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<td>Acting I</td>
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</tr>
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<td>Thea 201</td>
<td>Theatre Practicum</td>
<td>3</td>
</tr>
<tr>
<td>Thea 270</td>
<td>Stagecrafts</td>
<td>3</td>
</tr>
<tr>
<td>Thea 300</td>
<td>Play Direction I</td>
<td>3</td>
</tr>
<tr>
<td>Thea 423</td>
<td>History of Theatre: Classical, Medieval, Renaissance</td>
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<td>Thea 424</td>
<td>History of Theatre: 17th Century to the Present</td>
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<td>Thea 425</td>
<td>History of Theatre</td>
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</table>

3 hours from the following:

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<tbody>
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</tr>
<tr>
<td>Thea 426</td>
<td>Scene Design</td>
<td>3</td>
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<td>Thea 481</td>
<td>Theatre Practicum</td>
<td>3</td>
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<td>Theatre Practicum</td>
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</tr>
<tr>
<td>Thea 270</td>
<td>Stagecrafts</td>
<td>3</td>
</tr>
<tr>
<td>Thea 300</td>
<td>Play Direction I</td>
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</table>

Courses from the following to total 23 hours:

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<tr>
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<td>Advanced Makeup</td>
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</tr>
<tr>
<td>Thea 229</td>
<td>Creative Dramatics (on demand)</td>
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<tr>
<td>Thea 325</td>
<td>Stagecraft</td>
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</tr>
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<td>Scene Design</td>
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</tr>
<tr>
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<td>Playwriting</td>
<td>3</td>
</tr>
</tbody>
</table>
## Courses

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. F, S

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, S

122. **Makeup for Theatre and Television.** 1 credit. Principles of theatrical and television makeup with practical experience in the classroom. F, S

130. **The Art and Craft of Theatre.** 3 credits. Introduction to basic principles, theory, and techniques in performance, and examination of theatre with emphasis on participatory roles. For prospective majors and minors. F

161. **Acting I.** 3 credits. Basic principles of acting with emphasis on movement; basic character development through improvisation and script. F, S

162. **Introductory Acting II: Playing the Part.** 3 credits. Prerequisites: Thea 161 or consent of instructor. A continuation of Theatre 161, integrating the creative process in acting with the dramatic text. S

201. **Theatre Practicum.** 1 credit. Participation in theatre pre-performance and performance capacities, both technical and acting, under faculty direction. Repeatable to 8 hours. F, S

210. **Selected Topics in Theatre.** 1-3 credits. Repeatable up to 9 credits. Topics of special interest to faculty and students, such as Stage Management, and others. On demand.

220. **Voice and Movement II.** 2 credits. Prerequisites: Thea 120 or consent of instructor. A continuation of Thea 120 with a focus on freeing the channel for sound, range, resonance, tone, economy of movement, neutral mask and movement improvisation. F, S

222. **Advanced Makeup.** 1 credit. Prerequisite: Thea 122 or consent of instructor. A continuation of 122 with emphasis on various prosthetic techniques, mask building, and non-realistic styles. F

226. **Intro to Design.** 3 credits. Introduces the student to the principles and elements of design, the design process, and the methods of presentation of design ideas. F

229. **Creative Dramatics.** 3 credits. The study of theatre games, improvisations and techniques as they relate to the education and development of creativity in children. On demand.

230. **Text Analysis.** 3 credits. Prerequisite: Thea 130. An analysis of the dramatic text from the standpoint of production and performance. F

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 combination and floor exercises designed to enhance alignment, flexibility, strength and center. F

241. **Jazz Dance I.** 2 credits. This course is designed to introduce the student to the basic principles and techniques characteristic of jazz dance. Students will execute movement combinations in a variety of jazz styles. Emphasis will be placed on movement fundamental alignment, flexibility, endurance, dynamic range, and strength. F

242. **Tap Dance.** 2 credits. 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 fluidity. F

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 realistic texts. S

270. **Stagecraft.** 3 credits. Designed to familiarize the student with crafts and technologies of production; scenery construction, costume construction, painting, lighting equipment, sound techniques. Practical experience, shop procedures and safety practices are tied to lab experience in University productions. S

271. **Intermediate Acting I: The Actor in You.** 3 credits. Prerequisites: Thea 161 or 162 or consent of instructor. An introduction to the Meisner Technique with special emphasis on working together and discovering your truth in your art. Students advised to enroll concurrently in Thea 120. F

272. **Intermediate Acting II: The Meisner Challenge.** 3 credits. Prerequisite: Thea 271 or consent of department. Special problems and challenges for the actor to overcome through advanced study in the Meisner Technique. Primary focus on emotional preparation. Students are advised to enroll concurrently in Thea 220. S

300. **Play Direction I.** 3 credits. Prerequisites: Thea 161 and two credits in dramatic literature, or equivalent acting experience, or consent of instructor. Principles and techniques of directing for the theatre. Student laboratory directing experiences. F

320. **Voice and Movement III.** 2 credits. Prerequisite: Thea 220. 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 creating physical characteristics through mask work. F

325. **Scene Craft.** 3 credits. Prerequisites: Thea 226 and 270. Specialized construction and rigging of scenery. F

330. **Lighting for Stage I.** 2 credits. Prerequisite: Thea 270 or consent of instructor. The principles, mechanics and design of stage and television lighting; its relationship to set, stage design; and laboratory participation in University productions. F/S

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

336. **Lighting for Stage II.** 2 credits. Prerequisite: Thea 270, or consent of instructor. This course is specifically designed to develop a lighting aesthetic for directors, designers, and technicians. The class will be script analysis with practical application, plus laboratory participation in University Theatre productions. F/S

339. **Production Design.** 3 credits. Prerequisites: Thea 130, 226, 270, and 300, or consent of instructor. The development of the entire theatrical event, from conception to closing, with particular attention to the collaboration of various artists, craftsmen, and managers. S

340. **Ballet II.** 2 credits. Prerequisites: Thea 240 or consent of instructor. 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. S

341. **Jazz Dance II.** 2 credits. Prerequisites: Thea 241 or consent of instructor. 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. F

342. **Modern Dance.** 2 credits. Prerequisites: Thea 241 or 242 or consent of instructor. Students continue to explore the principles and techniques characteristic of modern dance through a variety of dance styles. Emphasis will be placed on applying efficient form and dynamic energy to intermediate level movement combinations in center and across the floor. S

350. **Dramatic Production and Criticism.** 3 credits. Prerequisites: Thea 130 and 250, or consent of instructor. An examination of the principles of production criticism and the application of those principles to a series of theatrical productions. F/S

371. **Advanced Acting I: The Psychology of Acting through Advance Scene Study.** 3 credits. Prerequisites: Thea 271 or consent of department. An introduction to the psychology of performance and application of skills from Thea 271 and 272 to contemporary realistic scripts making advanced demands on the actor. Students are advised to enroll concurrently in Thea 320. F

372. **Advanced Acting II: Acting Styles.** 3 credits. Prerequisite: Thea 371 or consent of department. Intensive study, research in, and performance of a variety of advanced literary works and styles. Students are advised to enroll concurrently in Thea 420. S

379. **Cooperative Education.** 1-6 credits. Repeatable to 12. Prerequisites: 2.5 GPA, junior standing. A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement among student, department, and employer. F

404. **Acting for the Music Theatre.** 3 credits. Prerequisite: Consent of instructor. Appreciation of and performance techniques for musical theatre including: voice and movement work, acting, and staging. S

415. **Selected Problems in Theatre Arts.** 1-3 credits. Repeatable up to 9 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. On demand.

420. **Voice and Movement IV.** 2 credits. Prerequisite: Thea 320. A continuation of Thea 320 with emphasis on specialized and advanced voice and movement skills. F

422. **American Theatre History.** 3 credits. The development of Theatre Arts in America from Colonial times to the present. On demand.

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

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

425. **Play Direction II.** 3 credits. Prerequisite: Thea 300 or consent of instructor. A continuation of Thea 300 with emphasis on contemporary theories, analysis, research, conceptualization, and implementation. Laboratory experience. S

426. **Scene Design for the Stage.** 3 credits. Repeatable up to 6 hours. The analysis, research, and conceptualization of the physical context of theatre productions. Emphasis on individual creative projects. F

427. **Costume Design.** 3 credits. Prerequisites: Thea 226, 270, or equivalent. Repeatable up to 6 credits. Elements, principles, and styles of design applied to the visual creation of a dramatic character. S

427. **Advanced Acting III: Shakespeare.** 3 credits. Prerequisites: Thea 372 or consent of department. A detailed examination of Shakespeare in performance. F

481. **Theatre Practicum.** 1-2 credits. Repeatable to 8 hours. Projects in all areas of theatre and interpretation in a supervisory capacity. Specific assignments in production/management with faculty approval. F/S

488. **Playwriting.** 3 credits. Repeatable up to 6 hours. Prerequisites: Sufficient background in theatrical arts and creative writing and consent of instructor. The playwriting’s problems as revealed through practice of writing plays; experimental productions of the student’s creative work whenever possible. F, S

494. **Senior Project.** 4 credits. Individual work in an approved area. F, S
University Courses (UNIV)

Courses

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. F, S

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, 126, and 127 may be counted toward degree requirements.) Academic issues involving this course will be handled through the College of Arts and Sciences. F, S

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, 126, and 127 may be counted toward degree requirements.) Academic issues involving this course will be handled through the College of Arts and Sciences. F, S

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, 126, and 127 may be counted toward degree requirements.) Academic issues involving this course will be handled through the College of Arts and Sciences. F, S

229. Study Abroad. 1 to 12 credits 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 grades earned will replace this marker course upon completion of credit transfer back to UND. Academic issues involving this course will be handled through the College of Arts and Sciences. F, S, SS

Women Studies

Women 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, a theory course, and a senior study offered through the College of Arts and Sciences. In Women Studies courses, women are the subject rather than the object of study. Using gender as a category of analysis, courses examine women’s experiences and the institutions and systems that affect women’s lives and, as well, examine how women in turn have shaped these institutions and systems to meet their and society’s needs. These understandings are as important for men as for women.

The Women Studies Program at UND was established in 1982, and a minor was approved by the Board of Higher Education in 1984. Students planning careers in law, business, medicine, education, service, and the sciences find a minor in Women Studies to be a useful complement. Other students choose Women Studies courses to provide coherence in their General Education Requirements. The Interdisciplinary Studies Program includes an option for a major in Women Studies.

College of Arts and Sciences

MAJOR IN INTERDISCIPLINARY STUDIES: WOMEN STUDIES

I. General Education Requirements (see University GER listing).

II. Interdisciplinary Studies Program Requirements:

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)

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 Studies Requirements (21 credits min.):

A&S 225 .......... Introduction to the Study of Women ....................................(3)
A&S 480 .......... Feminist Theory .....................................................................(3)
Engl 357 .......... Women Writers and Readers (repeatable when topics vary) .................................................................(3)
Hist 332 .......... Women in American History to 1865 .................................(3)
Hist 333 .......... Women in American History since 1865 ...........................(3)
Rels 116 .......... Women and Religion ...........................................................(3)
Soc 340 .......... Sociology of Gender and Sex Roles ....................................(3)

The following courses are commonly included in students’ programs: A&S 492: Senior Study: Women’s Studies (1-4), Comm 310: Media & Diversity (3), CJ 361: Victimology (3), IS 346: Contemporary Indian Women (3), Soc 335: The Family (3), as well as other courses in various departments cross-listed each semester in the Time Schedule of Classes.

MINOR IN WOMEN STUDIES

Twenty credits of courses in Women Studies completed with a GPA of at least 2.0 are required for the minor.

I. Required courses (total credits 6):

A&S 225 .......... Introduction to the Study of Women ....................................(3)
A&S 480 .......... Feminist Theory .....................................................................(3)

II. At least three of the following (total credits 9):

Engl 357 .......... Women Writers & Readers (may be repeated once when topics vary) .................................................................(3)
Hist 332 .......... Women in American History to 1865 .................................(3)
Hist 333 .......... Women in American History since 1865 ...........................(3)
Rels 116 .......... Women and Religion ...........................................................(3)
Soc 340 .......... Sociology of Gender & Sex Roles ....................................(3)

III. At least five hours from the following and/or from courses in various departments cross-listed each semester in the Time Schedule of Classes:

A&S 492 .......... Senior Study: Women’s Studies ................................. (1-4)
Comm 310 .......... Media and Diversity ........................................................(3)
CJ 361 .......... Victimology ..................................................................................(3)
IS 346 .......... Contemporary Indian Women ....................................................(3)
Soc 335 .......... The Family ..................................................................................(3)
Soc 309 .......... Ecofeminism ..................................................................................(3)

Students may declare a major or minor through the College of Arts and Sciences and should also contact the Director of Women Studies to design a program of study.
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THE GRADUATE SCHOOL MISSION

The Graduate School 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 Graduate School 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.

Each year approximately 650 new students enroll for degrees in the Graduate School, and approximately 500 students receive master’s degrees and 50 students receive doctoral degrees. In addition, the Graduate School offers extensive off-campus program offerings through the Division of Continuing Education.

THE GRADUATE SCHOOL: GENERAL INFORMATION

The Graduate School provides qualified post-baccalaureate students with the opportunity for advanced study toward a graduate degree. The Graduate School promotes excellence in scholarship and creativity, and encourages original research and competency in technical and professional fields. It is responsible for general supervision of all graduate activity in the departments, schools, and colleges of the University.

The majority of the graduate courses are offered on the Grand Forks campus; however, each semester some graduate courses are offered off campus through cooperative agreements between the Graduate School and the UND Division of Continuing Education. A number of distance degree programs are offered throughout the state of North Dakota. Students wishing to enroll in distance courses and programs must follow all graduate school policies and procedures.

The Graduate School is a member of the Midwest Association of Graduate Schools, the Western Association of Graduate Schools, the American Indian Professional Association, and the Center for Academic Integrity. The Graduate School 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 Graduate School. Graduate School policy is set by the Graduate Faculty which is made up of the President, the Vice President for Academic Affairs, the Dean of the Graduate School, and members of the University faculty who have been approved for membership on the Graduate Faculty. Approximately 525 faculty are members of the Graduate Faculty. A full listing of the Graduate Faculty is available on the Graduate School web site.

The Graduate Committee is the executive body of the Graduate Faculty. It is composed of the Graduate Dean, the Associate Dean, thirteen faculty members, that are elected by the Graduate Faculty to represent each of the academic areas, and one student member. The Committee formulates Graduate School policy, monitors program development on behalf of the Graduate Faculty, and serves as an appeal board for student petitions. Only members of the Graduate Faculty normally may serve on Faculty Advisory Committees and serve as advisors for graduate students.

GRADUATE SCHOOL ACADEMIC AREAS

The Graduate School is organized into thirteen academic areas. These areas and the programs or departments that comprise them are listed below:

- **Aerospace Sciences**: Atmospheric Sciences, Aviation, Earth Systems Science & Policy, Space Studies
- **Basic Medical Sciences**: Anatomy & Cell Biology, Biochemistry & Molecular Biology, Microbiology & Immunology, Pharmacology, Physiology & Therapeutics
- **Business**: Accounting, Business Administration, Economics, Finance, Industrial Technology, Information Systems & Business Education, Management, Marketing
- **Education**: Educational Foundations & Research, Educational Leadership, Instructional Design & Technology, Teaching & Learning
- **Engineering**: Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering
- **Fine Arts**: Art, Music, Theatre Arts
- **Health Professions**: Clinical Laboratory Science, Occupational Therapy, Physical Therapy, Physician Assistant
- **Human Development**: Communication Sciences & Disorders, Counseling, Physical Education, Exercise Science & Wellness, Social Work
- **Humanities**: History, Indian Studies, Philosophy & Religion
- **Mathematics and Natural Sciences**: Biology, Chemistry, Computer Science, Geology & Geological Engineering, Mathematics, Physics
- **Nursing**: Family & Community Nursing, Nutrition & Dietetics, Practice & Role Development (Nursing)
- **Social Sciences**: Anthropology, Criminal Justice, Geography, Political Science, Public Administration, Psychology, Sociology
- **Speech and Language**: Communication, English, Languages, Linguistics

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 Graduate School and serves as the Graduate School Curriculum Committee. The Graduate Committee is responsible for hearing appeals of decisions on student academic matters rendered by the Dean of the Graduate School. 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 Graduate School, any Associate Dean(s), and the appointed graduate student member. The graduate student member must be enrolled in the Graduate School and will serve a one-year term. The membership roster of the Graduate Committee is available from the Graduate School and is posted on the Graduate School web site.

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.

The Graduate School 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 University operates a variety of research centers such as the Bureau of Business and Economic Research, the Bureau of Governmental Affairs, the Bureau of Educational Services, the Center for Health Promotion and Prevention Research, the Center for Innovation, the Center for Rural Health, the Energy and Environmental Research Center, the Institute for Ecological Studies, the Institute for Remote Sensing, and the Social Science Research Institute. The University also works closely with the North Dakota State Geological Survey and with the U.S. Department of Agriculture Human Nutrition Research Center, located adjacent to the campus.

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 Graduate School reports directly to the Dean and is primarily responsible for all aspects of Graduate School 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 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.

GRADUATE PROGRAMS

The University offers programs of study leading to the doctorate in 24 fields. Fifty-eight 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.

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 Graduate School web site. Courses with 500 and 900 series numbers are graduate courses and are normally open only to graduate students. Certain 400 level courses are approved for graduate credit. All courses listed in the Graduate School 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.

ADDITIONAL INFORMATION

For detailed information students should consult the Graduate School Section of this Catalog or go to the Graduate School website at: http://graduateschool.und.edu. Address inquiries to the Dean of the Graduate School, 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 AND DEGREES

The following degree and certificate programs are offered through the UND Graduate School. Updates to this list may be found on the UND Graduate School web site.

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<tr>
<td>Psychology</td>
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APPLICATION DEADLINES

The University of North Dakota maintains flexible deadlines for most graduate programs; however, applicants are encouraged to apply as early as possible to assure admission and full consideration for financial aid. The Graduate School makes every effort to facilitate admission, but does not guarantee that applications received less than three weeks before the beginning of the semester will be able to be acted on in time for the beginning of the semester. The following programs observe specific application deadlines. Please check the Graduate School web site for updates to this list, as they are subject to change.

NOTE: It is strongly recommended that you submit and complete your application at least three weeks prior to the departmental deadlines. Applications must be complete in order to receive priority consideration. Applications are complete when all materials required by the program, e.g., transcripts, recommendation letters, official test scores, written statements, etc., have been received by the Graduate School.

- September 15: Environmental Engineering (Spring Admission)
- October 1: Anesthesia Nursing
- October 31: Teaching & Learning (Spring Admission)
- November 1: Criminal Justice (Spring Admission) Education: General Studies (Spring Admission)
- December 1: Nursing (Ph.D.)
- January 10: Counseling Psychology (Ph.D.) Psychology (Ph.D.)
- February 1: Counseling (M.A.)
- February 15: Biochemistry & Molecular Biology Biology Communication Sciences & Disorders Kinesiology Speech & Language Pathology
- February 28: Environmental Engineering (Fall Admission)
- March 1: English Linguistics Mechanical Engineering Physical Therapy Physician Assistant Studies Physics
- March 23: Mathematics

STUDENT AND FACULTY RESPONSIBILITY

IT IS THE RESPONSIBILITY OF THE STUDENT TO BECOME INFORMED AND TO OBSERVE ALL REGULATIONS AND PROCEDURES REQUIRED BY THE UNIVERSITY, THE GRADUATE 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. Each student who intends to present a thesis or dissertation in completion of a degree must follow the Graduate School guide to writing a thesis or dissertation. The student is responsible for knowing his or her academic standing and grade-point average. While the Graduate School 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 GRADUATE SCHOOL 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.

APPLICATION FOR ADMISSION TO THE GRADUATE SCHOOL

Those who have earned or will earn a four-year bachelor’s degree at a regionally accredited college or university in the United States, or the equivalent of this degree in another country, will be considered for admission to the Graduate School at UND.

Applicants may apply for admission to the University of North Dakota during their final year of undergraduate study, but must furnish proof of graduation before registration. Students are allowed to enroll in only one degree program at a time, with the exception of approved combined or joint programs.

The University of North Dakota would be pleased to receive your application for graduate study. Please address your request to:

Graduate School Admissions
University of North Dakota
264 Centennial Drive, Stop 8178
Grand Forks, ND 58202-8178
Phone (701) 777-2947, 1-800-CALL UND
FAX (701) 777-3619
E-mail: gradschool@und.edu
http://graduateschool.und.edu

Regression
Public Administration M.P.A.
Reading Education M.S., M.Ed.
Secondary Education (see Education-General Studies)
Social Work M.S., M.Ed.
Sociology M.A.
Space Studies M.S.
Special Education M.S., M.Ed.
Special Education/Cognitive/Developmental Disabilities M.S., M.Ed.
Special Education/Emotional Disturbance M.S., M.Ed.
Special Education/Learning Disabilities M.S., M.Ed.
Special Education Strategist M.S., M.Ed.
Special Education/Visual Impairment M.S., M.Ed.
Speech-Language Pathology M.S.
Teaching and Learning Ed.D., Ph.D.
Theatre Arts M.A.
Visual Arts M.F.A.

1 Non-thesis option is available
2 Non-thesis degrees only
* These programs are not accepting new students.

University of North Dakota
The University of North Dakota maintains flexible deadlines for most graduate programs; however, applicants are encouraged to apply as early as possible to assure admission and full consideration for financial aid. The Graduate School makes every effort to facilitate admission, but does not guarantee that applications received less than three weeks before the beginning of the semester will be able to be acted on in time for the beginning of the semester. The following programs observe specific application deadlines. Please check the Graduate School web site for updates to this list, as they are subject to change.

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- October 31: Teaching & Learning (Spring Admission)
- November 1: Criminal Justice (Spring Admission) Education: General Studies (Spring Admission)
- December 1: Nursing (Ph.D.)
- January 10: Counseling Psychology (Ph.D.) Psychology (Ph.D.)
- February 1: Counseling (M.A.)
- February 15: Biochemistry & Molecular Biology Biology Communication Sciences & Disorders Kinesiology Speech & Language Pathology
- February 28: Environmental Engineering (Fall Admission)
- March 1: English Linguistics Mechanical Engineering Physical Therapy Physician Assistant Studies Physics
- March 23: Mathematics
MINIMUM GENERAL GRADUATE SCHOOL ADMISSION REQUIREMENTS

1. A four-year bachelor’s degree from a recognized 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.). For combined degree programs, refer to the admission requirements under each department.

2. A minimum of 20 semester credits of appropriate undergraduate work in the chosen field.

3. A cumulative Grade Point Average (GPA) of at least 2.75 for all undergraduate work (2.5 for M.Eng.) 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, or TOEFL) must be sent directly by Educational Testing Services. 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 are not accepted. Not all graduate programs require testing for admission. Please consult the Graduate School web site (http://graduateschool.und.edu) for current information on admission tests.

All non-native speakers of English are required to submit the Test of English as a Foreign Language (TOEFL). Applicants must achieve a minimum score of 550 (paper-based), 213 (computer-based) or for the Internet based TOEFL the minimum scores for each category (Speaking 23/30, Listening 19/30, Reading 19/30 and writing 15/30) to be considered for admission. UND recognizes the IELTS test with a minimum overall band score of 6.5 or successful completion of English Language Service (ELS) level 112 as equivalent to TOEFL. This test must be sent directly from ETS—photocopies are not accepted. The TOEFL or equivalent requirement will not be waived for any reason, and test scores older than two years are no longer valid. Applicants who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to fulfill the English test requirement.

5. Transcripts, references, and/or any other materials sent prior to submission of your application, will be kept active for only 6 months. Please send all application materials directly to the Graduate School, not to the department to which you are applying. Supplemental information should be sent directly to the department. Once the Graduate School has received your application, you will be notified via e-mail. It is your responsibility to make sure the Graduate School has received all application materials; therefore, periodically checking on the status of your application is advisable. Once your application is complete, it will be forwarded to the department for evaluation. Each graduate program makes its own admission recommendation but the decision is not final until approved by the Dean of the Graduate School.

Note: An application is only valid for one year from the date of submission. Recommendation letters and written statements are not retained by the Graduate School once the application has been acted on. The application, evaluation & recommendation form, official transcripts and test scores and letter of offer are maintained as part of an accepted student’s academic files. Applications that have been deemed unacceptable are archived for one year and then destroyed. Students wishing to reapply to the Graduate School must resubmit new materials with the exception of official test scores. Archived files are inactive and normally will not be reopened by the Graduate School. Test scores will be retained for a period of one-year, but must be current at the time of reapplication.

6. 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 Graduate School 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 and the adequacy of their preparation for graduate study at UND. The Graduate School 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 above requirements for admission may be considered for QUALIFIED, PROVISIONAL, or DEFERRED admission status.

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 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 honours with a minimum of four years of study.

French or French-patterned education: Diplôme with a minimum of four years of post-baccalaureate study.

Other European, Latin American, Middle Eastern countries or Canada: University degree requiring a minimum of four years of study.

Three-year Bologna 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 Graduate School for up to date information on doctoral program admission requirements. Programs currently offering direct admission into a doctoral degree program include: Anatomy & Cell Biology; Biochemistry & Molecular Biology; Biol-
ology; Chemistry; Counseling Psychology; Engineering; Microbiology & Immunology; Pharmacology Physiology, and Therapeutics; and Physics.

All non-native speakers of English are required to submit the Test of English as a Foreign Language (TOEFL). Applicants must achieve a minimum score of 350 (paper-based), 213 (computer based) or for the Internet based TOEFL the minimum scores for each category: Speaking 23/30, Listening 19/30, Reading 19/30 and Writing 15/30 to be considered for admission. UND recognizes the IELTS test with a minimum overall band score of 6.5 or successful completion of English Language Service (ELS) level 112 as equivalent to TOEFL. This test must be sent directly from ETS—photocopies are not accepted. The TOEFL requirement will not be waived for any reason, and test scores must be valid (i.e., less than two years old) at the time of reapplication. Applicants who have received a bachelor’s degree or higher from the United States, English-speaking Canada, or the United Kingdom are not required to fulfill the English test requirement.

Graduate teaching assistancies 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 iBT. International students are required to submit a certification of finances to the Graduate School after an offer of admission has been made. Approximately $23,000 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.

APPLICATION PROCEDURE

Those who wish to be considered for graduate study are required to submit an application and supporting materials to the Graduate School. Applicants are encouraged 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.

Certain graduate programs require additional materials as part of their application process, i.e., writing samples, test scores, portfolios, etc. You should contact the department or the Graduate School for more specifics.

The Graduate School inactivates files in instances when the application was denied. Individuals wishing to reapply must submit a new application including all transcripts and letters of recommendations. Test scores will be retained for a period of one year, but must be current at the time of reapplication.

Delayed Admission

An applicant who has been admitted to the Graduate School may request to delay his/her term to enter for one semester only. After this point, the applicant will be required to submit a new application packet and be re-evaluated for admission. It is the responsibility of the applicant to request an admission deferral. Failure to request a deferral can result in the applicant being denied admission at a later date.

CATEGORIES OF ADMISSION

Applicants for degree programs may be admitted to Approved, Qualified, or Provisional Status. In certain cases applicants to degree programs may be granted Deferred admission status. The Graduate School has established minimal criteria for acceptance. Individual departments may have additional requirements. The various categories of admission are detailed in the following paragraphs.

Approved Status

Students who have met the minimum admission requirements stipulated by the Graduate School and have met all departmental requirements for admission are granted admission to Approved Status. Admission to this status implies only that a student is permitted to commence graduate work which normally will lead to a degree or diploma. 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 requirements except for prerequisite coursework which must be completed prior to advancement to candidacy. Generally, students will not be admitted to a degree program with more than six (6) credits of outstanding prerequisites. In such cases, students can enroll in post-baccalaureate or graduate non-degree status. Upon completion of the conditions of acceptance, and provided the student has earned a GPA of at least 3.00 for all work attempted, he/she is eligible to be advanced to Approved Status. Students in qualified status may be dismissed if they fail to meet the conditions of their acceptance.

Provisional Status

Admission to Provisional Status may be granted to an applicant who has not met one or more of the general graduate school or program level admission requirements, e.g., low G.P.A., low test scores, lack of a required test, or inadequate writing skills. All non-native speakers of English are required to submit the Test of English as a Foreign Language (TOEFL) or equivalent and must meet the minimal language requirements prior to matriculation. The first obligation of students admitted to Provisional Status will be to meet all of the conditions specified at the time of admission. Students admitted to Provisional Status because of their previous GPA will be eligible for advancement to Approved Status after the completion of 9 semester hours of work 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 specified conditions.

Deferred Admission Status

This status is reserved for applicants who intend to pursue a degree program and who are allowed to register in the Graduate School while a formal application for admission is completed and processed and eligibility is determined. Work taken in this status will not count toward a graduate degree at UND unless admission to a graduate program is secured. A Deferred Student who fails to gain admission to a graduate program by the next registration period will be considered to be in Non-Degree status. The status of those who are admitted will be converted to degree status retroactively. Students who have previously been Degree Seeking, Certificate or Non-Degree Students are not eligible for Deferred Admission status.

Non-Degree Status

Applicants who wish to take graduate classes but who do not want to earn a degree are classified as Non-Degree students. All applicants for non-degree status must possess a four-year bachelor’s degree earned at an accredited U.S. institution (or equivalent degree from another country). Subject to the approval of the department and the Dean of the Graduate School, 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.
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, and continuing education needs. A student registered in Post-Baccalaureate status may not change to another status until the completion of the term. All work taken will be graded on the Satisfactory-Unsatisfactory system and cannot be applied to any graduate degree program at the University of North Dakota. Any student who has been dismissed as a Degree Seeking, Certificate, Deferred Admission, or Non-Degree student is eligible to register in the Graduate School only as a Post-Baccalaureate student.

Transient Status

Transient students are those who are pursuing a graduate program at another university but who wish to enroll for a semester or summer session with the intent of returning to their home institutions. If aTransient student elects to remain at the University of North Dakota to work toward a graduate degree, formal application for admission to a degree program will be required; subsequently, if admitted, the student may ask the Advisory Committee to accept courses taken while in Transient Status to a degree program.

NOTE: All students taking courses in the Graduate School must maintain a 3.00 Grade Point Average unless otherwise stated in the individual program requirements. The academic standing of all graduate students, including those who are Non-Degree, Deferred, or Transient Status whose cumulative Grade Point Average falls below a 3.00 or the level required by the program, e.g., 2.75 for Master’s of Engineering degree, will be reviewed at the end of each academic term by the Graduate School Dean. 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: a) the GPA is raised to at least 3.00 (2.75 for M.Engr.); or b) 9 graduate credit hours are accumulated, whichever occurs first. If, at the end of the probationary period, the GPA is still less than 3.00 (2.75 for M.Engr.), the student will be dismissed.

REGISTRATION

UND Student Health Services Requirements: UND Student Health Services requires each student to complete a medical history and immunization record. Please complete the Health History Form and submit it to the University as soon as possible. You may pick up a Health History Form at Student Health Services or download the form in PDF format from the UND Student Health Services web site to be printed offline. If you choose to print offline, the completed form may be mailed to Student Health Services, 100 McCannel Hall, Stop 9038, Grand Forks, ND 58202-9038, or faxed to 777-4835. All students should read the Student Health Privacy Policy Acknowledgement which is available on the Student Health Services web site.

State policy requires documentation of immunity against measles, mumps, and rubella (MMR). Documentation of immunity means: a) evidence of two doses of measles, mumps, and rubella (MMR) vaccine no less than one month apart from a licensed physician or authorized representative of a state or local health department; b) proof of a positive serologic test for measles, mumps, and rubella, OR, c) proof of date of birth prior to 1957. Students will be allowed one semester to provide this information to Student Health Services and if it is not provided by then, further registration may not be allowed until proof of such immunization is provided. Exemptions for religious beliefs can be granted based on written requests. Exemptions for health reasons are also accepted when verified by a medical provider.

Other recommended immunizations include: Tetanus/Diphtheria Series and a booster within the past 10 years; Polio Series; Hepatitis B Series; Hepatitis A Series; and Varivax if you have not had a Chicken Pox vaccination. College students are also encouraged to consider being vaccinated for bacterial meningitis, a contagious disease that can cause serious health problems and which can be life threatening.

Graduate School Requirements: Any student who holds a baccalaureate degree and has established status as a Degree, Non-Degree, Deferred Admission, Post-Baccalaureate, or Transient 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. 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.

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. Students classified as Seniors may be granted graduate credit if they meet the criteria defined in the policy. Approval of the Graduate School 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, Graduate School, and departmental policies are subject to cancellation by the Graduate School Dean’s office.

Common Course Numbers

Course numbers for certain activities are uniform throughout the Graduate School and are not listed separately for each department:

- Scholarly Project, 2 credits ........................................ 995
- Continuing Enrollment, 1-12 credits .......................... 996
- Independent Study Report, 2 credits .......................... 997
- Thesis, 4-9 credits .................................................. 998
- Dissertation, typically 6-18 credits ............................ 999

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, with a full-time student registering for 9 credits. 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 Graduate School 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.
MINORS AND COGNATES

Some degree programs require or permit academic work outside of the area of concentration (major) in a supporting area which may be called a minor area, which must consist of at least nine credit hours, or a cognate area, which must consist of at least six credits. Credits earned toward a 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 committee member must be on the student’s committee 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. 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 at the 300-400 level cannot be used as a cognate area.

The student’s major requirements consist of 500 level courses or other courses (typically 400 level) that have been approved for graduate credit. The courses that have been approved for graduate credit are listed in the graduate section of the academic catalog after the department listings of the 500 level courses. Occasionally courses are approved for graduate credit between catalog revisions. Please contact the Graduate School if you have questions about courses that are not listed in the catalog.

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. For example, if an additional research project or paper is assigned to graduate students, students may be required to explain an area of interest in greater depth than what is required of an undergraduate.

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 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.
- 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.
- Typically, no more than 20% of the Program of Study will be allowed for co-op credit.
- The student will be required to present a seminar and submit a written report.

- The co-op experience must be compensated.

The Department’s requirements for registration in Graduate Cooperative Education may be more stringent than the minimums set by the Graduate School.

CERTIFICATE PROGRAMS

Some graduate programs offer certificate programs in addition to the degree programs. Certificate programs generally require a minimum of nine credit hours of coursework in approved graduate courses, some of which may be transferable to the parent graduate program. A minimum grade point average of 3.00 is required to earn the certificate. Only grades of “B” in courses taken as part of a certificate program may transfer to a degree program.

The purpose of a certificate program is to augment skills in an area. A student currently enrolled in a master’s program cannot obtain a certificate in the same field, with the exception of Health Administration for Public Administration students.

GRADUATE CREDIT

Graduate credit may be earned only by students enrolled in the Graduate School 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 Graduate School. 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 courses used for credit for one degree at UND cannot be used for credit toward a second UND graduate degree.

ELIGIBILITY TO WORK FOR AN ADVANCED DEGREE

Only those who have been officially admitted to the Graduate School as Degree Students on the basis of a letter from the Dean of the Graduate School 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 Graduate School for an extension if they are unable to satisfy the conditions of admission. Such petitions must be filed prior to the any deadlines that are in the admissions letter.

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, any graduate faculty membership, and any 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 Graduate School and/or Registrar’s Office. (Reference: UND Faculty Handbook)

PETITIONS AND APPEALS

Students who wish to be excused from Graduate School requirements must petition the Dean of the Graduate School on a form available from the Graduate School. 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. Graduate Students or members of the Graduate Faculty may appeal decisions of the dean to the Graduate Committee.

**ACADEMIC GRIEVANCE**

An “academic grievance” is a statement expressing a complaint, resentment, or accusation lodged by a student about an academic circumstance (such as grading, testing, and quality of instruction) which is thought by the student to be unfair.

Academic issues subject to grievance procedures differ from those subject to the academic petition process. If a student thinks that a petition has not been handled fairly, the student may initiate a grievance based upon unfair treatment, but not upon the substantive issue of the petition.

The grievance process available to graduate students depends on the issue as follows:

1. **Grades**
   
   An academic grievance involving the work in a course by a graduate student shall be resolved by the process prescribed by the college or school in which the course is offered. The process must commence with a discussion between the student and the instructor.

2. **Issues involving Graduate School policies and procedures.**
   
   Resolution of all other grievances by graduate students shall commence by discussion between the student and the party against whom the grievance is lodged. In the absence of resolution by such discussion, the grievance may be advanced by either party beginning at the next level and continuing as necessary through the persons/units/committees in the following sequence: a) advisor or advisory committee; b) the person assigned administrative responsibility for the graduate program in which the student is a major, i.e., Graduate Program Director or in the absence of such a person, the Department Chairperson; c) the Dean of the Graduate School. Decisions of the Dean of the Graduate School may be appealed. The UND Graduate Committee serves as the appellate body for grievances related to academic decisions made by the Dean of the Graduate School. The following Guidelines are provided for individuals wishing to file a grievance involving Graduate School Policies and Procedures. Please note that the most current version of this policy is on the Graduate School web site and that the most recent version of these Guidelines supersedes earlier versions.

**Guidelines for Graduate Student Grievance Hearings, University of North Dakota**

(Revised by the Graduate Committee November 20, 2006)

Note: These guidelines are periodically reviewed and revised by the Graduate Committee. Please consult the Graduate School web site or contact the Graduate School for the most current guidelines.

The Graduate Committee hears grievances brought by graduate students seeking redress on academic decisions made by the Graduate Dean. This document sets out the procedures for the consideration and hearing of student grievances.

**I. PRINCIPLES UNDERLYING STUDENT GRIEVANCE HEARINGS**

A. The procedures should be fair and transparent;

B. 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;

C. A grievant may be accompanied by an advisor, who may be a lawyer, when appearing at any grievance hearing;

D. The principle parties should have equal access to relevant information and documentation;

E. An individual’s privacy and confidentiality should be respected, subject to the need for an open and fair investigation;

F. Procedures should ensure that, where a grievance is upheld, appropriate action is taken;

G. Members of a student grievance hearing panel should disclose any professional or personal relationship they may have with any of the parties;

H. 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. GRADUATE SCHOOL STUDENT GRIEVANCE DOMAIN AND PROCEDURES:**

A. The Graduate Committee will review written student grievances concerning academic decisions made by the Graduate Dean.

B. 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.

1. Grade grievances are subject to review by the College in which the course is offered.

2. 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.

C. Definitions:

1. “Graduate Dean” refers to the Dean of the Graduate School or his or her designee.

2. “Day” means normal university school day when regular classes or examinations are held, not including Saturday and Sunday.

3. 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.

4. “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.

5. “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.

6. “Grievant” is the student filing the grievance.

D. 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

A. A student who disputes an academic decision should first discuss his or her concerns with the Dean of the Graduate School.

B. 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.

C. A grievance hearing is not a rehearing of the case. The following shall be allowed as grounds for grievance:
   1. Action of the Graduate Dean not being commensurate with the problem being addressed.
   2. Decisions contrary to the weight of evidence.

D. 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:
   1. The disputed academic decision (within the jurisdiction of the Graduate Committee);
   2. The person that made the decision;
   3. The date the decision was made;
   4. All efforts made to resolve the dispute informally and formally;
   5. Information directly relevant to the Panel’s review of the grievance;
   6. Relevant witnesses or individuals whom the grievant may call during the hearing;
   7. Any other relevant pertinent evidence or documents and;
   8. The desired outcome the student is seeking as a result of a grievance hearing.

E. 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 Graduate School within 5 days of the approval decision.

F. 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:
   1. Issues raised by the grievant;
   2. All efforts made to resolve the dispute informally and formally;
   3. Information directly relevant to the Panel’s review of the grievance;
   4. Relevant witnesses or individuals whom the Graduate Dean may call during the hearing;
   5. Any other relevant pertinent evidence or documents; and
   6. 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

A. 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.

B. 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:
   1. Be present and hear all arguments and oral statements made to the Panel during the hearing;
   2. Make arguments, present oral statements and written documents, and call witnesses with regard to issues of fact relevant to the grounds for grievance; and
   3. Ask questions of other witnesses, either directly or through the Chair (to be determined by the Chair).

C. 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 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.
VII. ORDER OF PROCEEDINGS IN A GRIEVANCE HEARING

A. 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.

B. Following the Chair’s summary, and unless otherwise determined by the Chair of the Panel, the order of presentation will be:

1. 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;
2. 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;
3. 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;
4. Summary by the Graduate Dean (5 minutes);
5. Summary by the Student (5 minutes);
6. Declaration by the Chair that the hearing is concluded.

VIII. FINDINGS, DECISIONS, AND RECOMMENDATIONS OF THE PANEL

A. 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.

B. If, in the course of deliberations, the Panel determines it would like to obtain additional information from either party, or from any other individual that the Panel feels could provide useful information, the Chair of the Panel will reopen the hearing at a mutually convenient time for all parties.

C. The Panel Chair will prepare a written final decision, to include:

1. A statement addressing the subject of the grievance;
2. A decision that indicates whether the grievance is upheld, denied, or if a modified solution to the situation is recommended;
3. (Optional) recommendations, if appropriate, for further actions by University authorities.

D. All members of the Panel sign the Decisions, Findings, and Recommendations document.

E. 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

A. The Panel acts on behalf of the Graduate Committee. The student may grieve the decision of the Panel to the Student Academic Standards Committee.

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 should complete a Graduate School Withdrawal Form available from the Graduate School or the Graduate School web site.
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 Graduate School by submission of a “request for leave of absence from graduate study” in advance of their leave. Degree and certificate seeking students who do not submit a leave of absence will be required to apply for readmission to the Graduate School 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.

GRADUATE WORK BY UNDERGRADUATES

Graduate courses normally are open only to graduate students. An undergraduate senior at UND may enroll in graduate courses (500 level) for undergraduate credit. A student below the standing of a senior must have the permission of the instructor and Graduate Dean to take a graduate course.

An undergraduate student may be granted graduate credit for the courses listed in this section of the catalog if:
1. The credits being petitioned are not needed to complete requirements for the baccalaureate degree;
2. The course(s) are listed in the current Graduate School Catalog;
3. The petition is filed by the last day to add a 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 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.

MAXIMUM AND MINIMUM ACADEMIC LOADS

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. Graduate Assistants must carry at least 6 credits each semester or 3 credits in a summer session.

GRADING SYSTEM

A graduate student will be allowed credit for a course only when a grade for the course has been reported to the Office of the Registrar. Grades awarded in all courses are indicative of the quality of the work done. Their significance is as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Honor Point Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(Superior) 4 Honor Points</td>
</tr>
<tr>
<td>B</td>
<td>(Excellent) 3 Honor Points</td>
</tr>
<tr>
<td>C</td>
<td>(Acceptable) 2 Honor Points</td>
</tr>
<tr>
<td>D</td>
<td>(Passing, but no graduate credit awarded) 1 Honor Point</td>
</tr>
<tr>
<td>F</td>
<td>Failure 0 Honor Points</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
</tr>
<tr>
<td>S</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

| U     | Unsatisfactory |
| W     | Withdrawn |
| SP    | Satisfactory Progress (995,997,998 & 999) |
| UP    | Unsatisfactory Progress (995,997,998 & 999) |

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 Graduate School. Grades of less than “C” are not included in the number of credits accepted for a graduate degree, but they are counted in determining the cumulative GPA. Credits and grades for courses accepted in transfer, or courses graded on a Satisfactory-Unsatisfactory basis are not counted in determining the GPA. Courses with grades of Incomplete are neither counted as partial fulfillment of degree requirements nor calculated in the GPA.

SATISFACTORY/UNSATISFACTORY GRADING

Some seminars, research, thesis, dissertation, and field work may be graded on a Satisfactory/Unsatisfactory basis. Those courses usually are marked in the Schedule of Courses, and the entire registration for the course will be graded on the S/U basis. The student does not have the option of receiving a grade. Graduate students do not have the option of electing S/U grading in either graduate or undergraduate courses.

INCOMPLETE GRADES

It is expected that students will complete all requirements for a course during the time frame of the course. For reasons beyond a student’s control, and upon request by the student or on behalf of the student, an incomplete grade may be assigned by the instructor when there is reasonable certainty the student will successfully complete the course without retaking it. The mark “I,” Incomplete, will be assigned only to the student who has been in attendance and has done satisfactory work up to a time within four weeks of the close of the semester, including the examination period, and whose work is incomplete for reasons satisfactory to his or her instructor.

Incompletes are entered on the final grade sheet, and instructors must also sign and submit a “Report of Incomplete Grade” form to the Office of the Registrar. The instructor may choose any one of the following options for the deadline to complete the course:
1. The default date as stated in the “UND Schedule of Courses.”
2. Extend to 12 calendar months after the end of the course.
3. A date of the instructor’s choosing no later than 12 months after the end of the course.

Incomplete grades will convert to a grade of “F” if a grade is not submitted by the instructor to the Office of the Registrar on or before the deadline written on the “Report of Incomplete Grade” form.

The instructor of the course and the Dean of the Graduate School 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

The Graduate School or the Honors Program may assign a grade of “SP,” Satisfactory Progress or “UP,” Unsatisfactory Progress to Honors Thesis (489), Scholarly Project (995), Thesis (998), Dissertation (999), Independent Study (997), Research Design (Engineering 595), English 591, Professional Exhibition (VA 599) or Research (leading to the thesis or dissertation). The “SP” or “UP” grade for these activities, which usually span several sessions, 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. Students failing to show satisfactory progress may face dismissal.

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. 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 Graduate School. It is up to the student to notify the Graduate School 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.

ACADEMIC STANDARDS

A cumulative grade point average (GPA) of at least 3.00 for all work taken as a graduate student, i.e., while registered in the UND Graduate School, must be maintained in order to remain in satisfactory academic standing in the Graduate School; however, mere maintenance of a 3.00 GPA or better may not be considered adequate satisfactory performance. Satisfactory performance may include, but is not limited to, satisfactory research performance, a satisfactory GPA in the major, satisfactory performance in examinations, such as the comprehensive examination, or satisfactory performance in other specific program requirements.

The academic standing and progress of Degree 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 conditions regarding Grade Point Average are as follows:

1. No decision on dismissal will be reached until a minimum of 9 graduate credits has been accumulated.
2. 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 Graduate School. 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 (a) the GPA is raised to at least 3.00 (2.75 for M.Engr.) or (b) 9 graduate credit hours are accumulated, whichever occurs first. If, at the end of the probationary period, the GPA is still less than 3.00 (2.75 for M.Engr.), the student will be dismissed.

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 Graduate School at UND, may be applied toward a graduate degree at the University of North Dakota. Graduate work is considered for transfer only on an individual basis and only after the student has completed satisfactory work in residence at UND. Those transfer credits approved by the student’s advisory committee and the Dean of the Graduate School are included in the program of study for the UND graduate degree and only those transfer credits will be recorded on the UND transcript.

The basic purpose of the transfer policies is to ensure that transferred work is of comparable content, level, timeliness, and quality to that which would be taken at UND and included on the program of study for the degree. The following policies are generally applicable to the acceptance of the graduate work for transfer to UND:

- The work must have been taken at an accredited North American institution.
- The student must have been enrolled as a Graduate Student.
- The work must have received graduate credit at the institution where it was earned.
- The student must have earned a grade of B or better.
- The work must be less than seven years old at the time the UND degree is awarded with the exception of work that was part of a completed prerequisite degree.
- The amount of transfer credit that will be accepted toward the master’s degree is one-fourth (usually eight semester credits) of the credit hours required for the degree.
- The work credited toward a completed master’s degree may be accepted for a specialist’s diploma or doctoral degree.
- Work beyond the master’s degree must be post-master’s level and from an institution that offers post-master’s degrees in the discipline.
- Work beyond the master’s degree from an institution offering only master’s level work in the discipline may be applied to the minor or cognate areas.
- For the Ph.D., only 30 credits may be transferred beyond the credits allowed for the master’s degree, i.e., a total of 60 credits.
- For the Specialist Diploma, only 15 credit hours will be transferred beyond the credits allowed for the master’s degree, i.e., a total of 45 credit hours.

RESIDENCE REQUIREMENTS

Some graduate degree programs, especially those with a significant research/creative component, require that students spend a minimum period of time in residence during their course of study. The purpose of residence is to provide an opportunity for sustained and concentrated intellectual effort, to provide for immersion in a research environment, and to permit extensive interaction with fellow students and faculty of the major department.
In order to meet a residence requirement, a student must devote full time to academic study and must be registered for at least nine credits in a semester or six credits in a summer session, or be a graduate assistant.

The Residence Requirements are stipulated for each graduate degree program in this catalog. A year of residence requires two consecutive semesters of residence. Two years of residence requires four consecutive semesters of residence or three semesters and two summer sessions, all without interruption.

Any exceptions to the policies stated above must be approved in advance by the student’s advisory committee, the student’s department, and the Dean of the Graduate School.

**MAXIMUM PERIOD ALLOWED FOR GRADUATE PROGRAMS AND REVALIDATION OF COURSES**

Graduate courses more than seven years old are considered obsolete and may not be counted to fulfill course requirements for an advanced degree program. Programs of study more than seven years old are also obsolete.

Obsolete UND graduate courses may be revalidated and may be counted toward an advanced degree on the recommendation of the student’s Faculty Advisory Committee and with the consent of the Dean of the Graduate School. In no case will more than one-half a program 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 procedure. Contact the Graduate School for the proper revalidation form.

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.

**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 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 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 RADIATION**

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.

**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 Technology Transfer & Commercialization.

**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.

**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 Graduate School petition form to the instructor of the course and must be approved by the student’s department and the Dean of the Graduate School 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.

**CONTINUING EDUCATION**

**Master and Doctoral Degrees Offered at a Distance**

The University of North Dakota Graduate School, through the Division of Continuing Education, offers master’s degrees and doctoral degrees at a distance to North Dakota citizens as well as to students located throughout the United States and internationally. Many of the degree programs are delivered through videoconferencing utilizing the North Dakota Interactive Video Network (IVN). Other distance delivery methods are available, depending on the program. Students wishing to enroll in these programs must apply to and gain admission to the Graduate School and are subject to all Graduate School policies and procedures. Graduate Degree programs currently being offered include:

- Master’s Degree Programs:
  - Business Administration
  - Public Administration
  - Social Work
  - Counseling Psychology and Community Services
  - Forensic Psychology
Educational Leadership
Instructional Design & Technology
Special Education
Early Childhood Education
Elementary Education
Education: General Studies

Doctoral Degree Programs:
Educational Leadership
Teaching & Learning

For more information on degree programs and/or courses offered at a distance, please contact the UND Graduate School or Division of Continuing Education.

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 Graduate School.

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 normally may not be applied toward graduate degree requirements. The Graduate Dean may approve the inclusion if the workshop involves critical review, analyses, discussion, theory, or content similar to graduate courses. If approval is being sought, do so prior to taking the course. A syllabus of the course would be required.

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 Graduate Dean, a student may take work by correspondence to remove deficiencies in the undergraduate background.

CANDIDACY FOR DEGREES

Admission to the Graduate School 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.

GRADUATION-APPLICATION FOR DEGREE OR DIPLOMA

Students who expect to receive a degree must file an Application for Graduate Degree in the Graduate School 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 Graduate School 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.

GRADUATE SCHOOL AWARDS

Applications for Graduate Assistantships are accepted throughout the year; however, students are reminded that most appointments for the Fall semester are offered by March 15. Students should contact the department for information.

Deadlines for Scholarships and Fellowships are announced each year. Information and applications are available in the Graduate School and in the department.

The following policies are applicable to the award and retention of graduate appointments and awards:

1. Students admitted to the Graduate School 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 Graduate School as a degree seeking student.

2. Degree seeking students in “Approved” or “Qualified” Status may hold awards or appointments.

3. Assistantship appointments will not exceed one-half time in all combinations.

4. 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 with fewer than six credits remaining on their program of study.

5. Students must maintain a 3.00 GPA (2.75 Master of Engineering) to retain awards or appointments.

6. A student may be removed from an appointment due to unsatisfactory performance.

7. Students in good academic standing, i.e., a GPA of 3.00 or higher are eligible for reappointment.

8. Students who withdraw from or are dismissed from the Graduate School become immediately ineligible for and may not continue to hold an appointment or award.

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.

Graduate assistantship stipends are subject to income tax and tax will be withheld. Tax will not be withheld from scholarships, traineeships, and fellowships, but the stipend may be taxable. Rulings as to the actual taxability of any specific stipend are in the hands of the Internal Revenue Service.

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 Graduate School 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.

Awards

Amy Hui-Mei Chen Hung Fellowship is awarded to a graduate of the National Taiwan Normal University (NTNU) who wishes to pursue doctoral studies at UND. The applicant must intend to return to NTNU upon graduation.

Chester Fritz Scholarships of $1,000 each are awarded to North Dakota students with an outstanding academic record who are continuing graduate work.
An Alumni Prize of $1,000 is awarded each year to a graduate student who has completed at least one year of graduate work. This prize, which may be granted in addition to other major awards, is in recognition of outstanding academic performance.

K. B. Tiffany Scholarship of $1,000 is awarded, by nomination, to a student pursuing a graduate degree in English. Consult with the English Department.

Bernhardt A.E. Lester Memorial Scholarship is for a graduate student interested in studying abroad. The money is available to any graduate student who enrolls at an institution in Germany, France, or Scandinavia and provides a record of matriculation there from.

Neil C. Macdonald Memorial Scholarships of $1,000 are awarded on the basis of promise of high academic achievement and in accord with the ideals and purpose of the University of North Dakota to two graduate students, one of whom should be in History.

The Christopher and Ernestine Kandel Hamre Trust Fellowships are available annually to two terminal year doctoral students in the Department of Anatomy. The fellowships provide a stipend plus the cost of tuition to the student, and will provide cost of education/research funds to the department in support of the student.

The George and Margaret Seaworth Scholarship is for a continuing graduate student interested in the medical or social issues of gerontology. The recipient should be of good character with above average grades.

Tuition Waiver Scholarships provide a waiver of tuition to students who are commencing or continuing work toward a graduate degree. Awards are made on the basis of academic achievement and promise.

Cultural Diversity Tuition Waivers may be available. Applications are available in the Graduate School or on the Graduate School’s web site.

Summer Doctoral Fellowships of $5,000 plus a waiver of tuition for the summer session are available to doctoral students who have an approved Dissertation Proposal on file in the Graduate School and plan to work on their dissertation/research full time during the summer. Applications are due early in the Spring semester and will be evaluated on the basis of an application and recommendations from the advisor and the chairperson.

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 15 to 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 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. A health insurance plan is also available. Graduate Teaching Assistantships are available in most departments offering a graduate degree.

Graduate Teaching Assistants must be proficient English language proficiencies. International students who are non-native 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 score at least 26 on the spoken section and meets all other section requirements. Contact the Graduate School for more information.

Graduate Research Assistantships are offered in many of the departments of the University, e.g., sciences, engineering, and education. These appointments usually carry a monthly stipend. Graduate Research Assistants may be eligible for a tuition waiver. Tuition waivers may be partial or full; the decision to offer a waiver and the amount of the tuition waiver is determined by the individual program. Students are responsible for any tuition not covered by the waiver and all other fees. A health insurance plan is also available. 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. If the research is included in a student’s program of study for a degree, the student must carry an academic load as a full-time student, i.e., 12-16 credits per semester. If the research is not part of the student’s program, load restrictions apply. Half-time and quarter-time assistants must carry a minimum of six credits per semester (3 for summer).

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. Graduate students are employed half-time or quarter-time, for work in a particular service unit related to their area of academic interest. Stipends vary with the time devoted to service work but are comparable to the stipends of graduate teaching assistants. Tuition may be waived for these assistantships. Academic load requirements are the same as for teaching assistants.

DEGREE REQUIREMENTS

It is the student’s responsibility to be familiar with the requirements for a degree. The student may expect guidance from the advisor and the staff in the Graduate School. The requirements are listed in this section of the catalog and in the section entitled “Departmental Programs.”

MASTER OF ARTS, MASTER OF SCIENCE

These degrees are available with a thesis option in most fields. A non-thesis option is available in selected fields.

Thesis Option

Course Requirements: A minimum of 30 semester credits is required in a program of study for the M.A. or M.S. degree in a major field. This includes the credits granted for the thesis and the research leading to the thesis. At least one-half of the credits must be at or above the 500-level. Fifteen semester credits must be taken on campus through UND. A maximum of eight semester credits may be transferred from another institution. Workshop credits are normally not accepted on the program of study, but may be considered with the approval of the advisory committee and the dean of the Graduate School. A maximum of four semester credit hours may be considered.

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. Students should refer to the section of this catalog entitled “Departmental Programs” for program specific admission, degree examination, and course requirements.

Residence Requirements: Typically, a student must spend a minimum of one semester or two summer sessions in residence on this campus. Students should expect to spend about the equivalent of two years as a full-time student to complete the M.A. or M.S. program with a thesis. Note: The Residence Requirement is in effect unless modifications have been granted to the department by the Gradu-
Thesis: The student must submit a thesis to the Graduate School 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, one copy of which will be provided to the student by the Graduate School when the program of study is approved. The “Manual” is also available on the Graduate School web site.

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 Proposal of Thesis, available with instructions from the Graduate School, then submitting the proposal to the Advisory Committee for its approval. The approved proposal is then filed in the Graduate School to become part of the record. The proposal must be approved before the beginning of the semester in which the student expects to graduate, and must be filed in the Graduate School before a student is advanced to candidacy for a master’s degree.

A preliminary draft of the thesis must be presented to the Advisory Committee sufficiently in advance of the preliminary approval deadline that the Advisory Committee may thoroughly evaluate and correct the thesis. After the necessary corrections and changes have been made, the student should secure the committee members’ signatures on a form entitled Preliminary Approval of Theses and Dissertations, available on the Graduate School’s web site, and file this form in the Graduate School. 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 Graduate School no later than the deadline specified in the Academic Calendar, or the student will not be permitted to graduate that semester.

Copies of the thesis in its final form must be prepared and presented to the student’s Faculty Advisory Committee in time that they may thoroughly read the thesis prior to the final examination. When the final version of the thesis has been approved by the Committee, a copy must be deposited in the Graduate School and receive the signed approval of the Dean by the deadline announced in the Academic Calendar (usually two weeks prior to commencement).

The Graduate School will have the final copy of the thesis bound and cataloged in the University Library. The student must submit one copy to the major department and one to the advisor.

Candidacy for the Degree. Admission of a student to the Graduate School as a Degree Student in Approved Status implies only that the student has met the minimal entrance requirements and will be permitted to take graduate courses which normally will lead to a degree. The student has not been admitted as a candidate for a degree. Advancement to candidacy is a formal procedure and can be granted only after the student has met certain academic requirements. To become a candidate for the Master of Arts or Master of Science (thesis options), the following requirements must be met in approximately the following sequence:

1. Completion of the equivalent of one full-time semester (9 semester credits).
2. A GPA of at least 3.00 for all work attempted.
3. The appointment of a Faculty Advisory Committee. This Committee is appointed by the dean upon the recommendation of the chairperson, or designate, of the student’s major department and normally will consist of three members, but may consist of four. The form for Committee appointments is available at the Graduate School and on the Graduate School web site. If the student intends to include a minor on the program of study, one committee member must be chosen to represent the minor field. The chairperson of the Committee normally must be a Full Member of the Graduate Faculty but may be an Associate Member under certain conditions, must represent the student’s area of interest, and must serve as the thesis advisor. The Committee is responsible for program advisement, thesis advisement, and examination of the student.

4. Approval of a Program of Study. Until such time as a student selects a thesis advisor, the department chairperson, or designate, will act as a temporary advisor for the selection of courses, etc. After the formation of a Faculty Advisory Committee, the student and the Committee should formulate a Program of Study for the degree on a form available from the Graduate School and on the Graduate School web site. The program should be developed early in the second semester of enrollment. After the program has been signed by the student and the Committee, it is submitted to the Graduate School for the approval of the Dean.

5. Approval of a Proposal of Thesis on a form available from the Graduate School and on the Graduate School web site. This proposal, when approved by the Faculty Advisory Committee and deposited in the Graduate School, indicates acceptance of a topic for study and incorporation into a thesis. The proposal must be filed at the Graduate School the semester or session prior to the one in which the student expects to graduate.

Students and their advisors 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. Students are required to present themselves for a final examination before their full Faculty Advisory Committee. The examination will be written and/or oral and will include defense of the thesis, but also may include examination over the course of study for the degree. Examinations are to be scheduled one week in advance by the Committee through the Graduate School. The results must be reported to the Graduate School, on the Final Report on Candidate form, by the deadline specified in the Academic Calendar. The Committee members must have had an opportunity to examine the final copy of the thesis prior to the examination and will indicate their approval by signing the approval page of the thesis. Final examinations which are failed may be repeated only with the prior approval of the Advisory Committee and the Dean.

Non-Thesis Option

The degrees Master of Arts and Master of Science without a thesis are available only in selected fields. Except as noted below, the requirements are the same as those listed under the thesis option.

Course Requirements. A minimum of 32 semester credits is required for the degree. This includes 2 credits in the major for an independent study report for which the student registers for the course numbered 997 or 995. The program may include just the major, the major and a minor, or the major and a cognate area. The major must include at least 22 credits from the major department and a minor or cognate area must include at least nine credits.

Students should refer to the section of this catalog entitled Departmental Programs for additional admission, degree, examination, and course requirements unique to each department.
Residence Requirement. There is no residence requirement for the non-thesis M.A. and M.S. degrees; however, at least half of the credits for the degree must be taken on the UND campus.

Independent Study. The independent study 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.

The topic for an independent study 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 with instructions from the Graduate School and on the Graduate School web site, then submitting the proposal to the advisor for approval. The proposal, which must be approved no later than the semester or session prior to the one in which the student expects to graduate, must be filed in the Graduate School 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 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 Graduate School by the deadline specified in the Academic Calendar and submit a grade for 997-Independent Study or 995-Scholarly Project to the Office of the Registrar.

Candidacy for the Degree. The requirements for advancement to candidacy under the non-thesis option are the same as those listed under the thesis option with the following exceptions:

1. Advisor. Students must obtain the appointment of an advisor from the major department. The advisor, who must be a member of the Graduate Faculty, will be appointed by the dean, upon the written recommendation of the chairperson, or designate, of the student’s major department. The advisor is responsible to the department and to the Graduate School for the supervision of the student’s work.

2. Program of Study. Students must submit a Program of Study for Graduate School approval which will have been developed in consultation with the advisor and signed by the departmental chairperson (or designate). If a minor is declared, the program must also 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 Graduate School.

3. Topic Proposal of Independent Study. Students must obtain approval of a topic for the independent study. The advisor approves the Topic Proposal of Independent Study, and the student submits the form to the Graduate School to become part of the record. The topic proposal must be filed prior to the semester or session in which the student expects to graduate.

Final Examinations. Those advanced to candidacy for non-thesis master’s degrees must pass written final comprehensive examinations which must cover the major field but may, at the advisor’s discretion, draw upon or cover the supporting areas. Such examinations generally will be given and evaluated by the major department, but the results will be certified to the Graduate School by the advisor and the department chairperson on the form Final Report on Candidate by the deadline specified in the Academic Calendar. The appropriate comprehensive examination(s) will be arranged by the advisor and administered by the department no earlier than the semester preceding the semester in which the candidate intends to graduate.

Comprehensive examinations which are failed may be repeated only with the prior approval of the advisor, the department, and the Dean, but in no event earlier than at the next regularly scheduled offering. Candidates may not take the final comprehensive examination(s) unless they have been advanced to candidacy for the degree, and are in satisfactory academic standing.

MASTER OF BUSINESS ADMINISTRATION
(See Business Administration under Departmental Programs)

MASTER OF EDUCATION

The Master of Education degree (M.Ed.) is designed for those who wish to prepare for careers as teachers, specialists, administrators, or supervisors in elementary or secondary schools. To be eligible for the degree, a student must meet the undergraduate requirements in Education, i.e., eighteen semester credits in Education, including student teaching, and must be offered admission to the degree program by the Dean of the Graduate School.

The Master of Education degree is available for those doing major work either within or outside of the College of Education and Human Development. The areas of concentration available are: Educational Administration, Elementary Education, Special Education, and Reading Education. The degree also is available in departments offering a secondary teaching major.

Course Requirements. A minimum of 32 semester credits is required for the M.Ed. degree, of which at least one-half must be at or above the 500 level. No less than 12 credits, including 2 for the Independent Study Report (997), must be in a single field or an area of concentration (major). At least 6 credits must be in an area or areas cognate to the area of concentration. At least 6 credits must be in the Foundations of Education. A total of 16 credits may be taken off-campus.

Residence Requirement. There is no residence requirement for the M.Ed. degree; however, at least one-half of the graduate program must be taken on this campus.

Transfer of Credit. A maximum of eight credits may be transferred from another institution.

Workshop Credit. A maximum of four credits may be taken in approved workshops, but workshop credits normally are not included in the program of study.

Independent Study. The independent study is designed to enable the student independently to investigate a topic related to the major field of study. The study may be a presentation, analysis, or discussion of information and ideas already in the literature of the field. The requirement is designed to ensure that a student can investigate a topic and organize and present a scholarly report on the investigation.

The topic for an independent study must be approved by the student’s advisor. The independent study proposal, which must be approved no later than the semester or session prior to the one in which the student expects to graduate, must be filed in the Graduate School before a student is advanced to candidacy for a master’s degree.

The student must prepare and secure the advisor’s approval of an independent study report. Three copies of the report (one each for the student, the advisor, and the department) must be accepted by the advisor who will certify completion of the report to the Graduate School by the deadline specified in the Academic Calendar and submit a grade for 997-Independent study to the Office of the Registrar.

Candidacy for the Degree. To become a candidate for the Master of Education degree the following requirements must be met in approximately the following sequence:
1. Completion of the equivalent of one full-time semester (12 semester credits).
2. A GPA of at least 3.00 for all work attempted.
3. Appointment of an advisor from the major department. The advisor, who must be a member of the Graduate Faculty, will be appointed by the dean upon recommendation of the chairperson of the student’s major department. The form for advisor appointment is available at the Graduate School or on our web site at: http://www.und.edu/dept/grad/. The advisor is responsible to the department and the Graduate School for the supervision of the student’s work.
4. Approval of a Program of Study on a form available from the Graduate School or on the web site. The program, which should be developed in consultation with the advisor, early in the second semester, must bear the signature of the student, the advisor, and the department chairperson (or designee) and must be submitted to the Dean of the Graduate School for approval.
5. Approval of a topic for the independent study by having the advisor sign the Proposal of Independent Study form and submitting the Proposal to the Graduate School.

The student and the advisor will be notified in writing of the advancement to candidacy. **Students must complete all requirements for advancement to candidacy prior to the semester in which they plan to graduate.**

**Final Examinations.** Candidates for the Master of Education degree must pass written final comprehensive examinations which must cover the major field but may, at the advisor’s discretion, draw upon or cover the supporting areas. Such examinations generally will be given and evaluated by the major department, but the results will be certified to the Graduate School by the advisor and the department chairperson on the form, Final Report on Candidate, by the deadline specified in the Academic Calendar. The appropriate comprehensive examination(s) will be arranged for by the advisor and given by the department no earlier than the semester preceding the semester in which the candidate intends to graduate. Comprehensive examinations which are failed may be repeated only with the prior approval of the advisor, the department, and the Dean, but in no event earlier than at the next regularly scheduled offering.

Candidates may not take the final comprehensive examination(s) unless they have been advanced to candidacy for the degree, and are in satisfactory academic standing.

**COMBINED DEGREES**

The University of North Dakota is currently offering combined degrees in Applied Economics, Business Administration, Chemistry, Public Administration, Chemical, Mechanical, Civil and Electrical Engineering. The intention of these programs is to allow qualified students to complete requirements for both a baccalaureate degree and a master’s degree in one year beyond that which is required to receive the undergraduate degree.

**ENGINEERING COMBINED DEGREE PROGRAMS**

To encourage undergraduate engineering students to extend their studies to include a graduate degree, the School of Engineering and Mines has a combined program, which permits students to earn both bachelor’s and master’s degrees 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 engineering combined degree program after the completion of 95 credit hours towards the bachelor’s degree with a GPA of at least 3.0 and before completion of the bachelor’s degree.

The deadline for a completed application to be received in the Graduate School is listed at the end of this section. A complete application includes:

- Graduation School Application and application fee
- Three letters of reference
- Statement of Purpose
- Transcripts
- 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 Graduate School on completion of 125 credit hours towards the bachelor’s degree with a GPA of 3.0 or higher.

Students in the program may opt to be awarded their bachelor’s and master’s degrees sequentially or at the same time.

Students interested in these programs need to refer to the individual departments for admission and program requirements.

Applications must be completed by:
- August 15 for Fall Semester Admittance
- December 15 for Spring Semester Admittance
- April 15 for Summer Semester Admittance

**MASTER OF ENGINEERING**

The Master of Engineering (M. Engr.) is a professional degree with a program designed to provide a strong emphasis toward the practice of engineering in industry, business, or government. The focus of the program is on the development of competency in the area of engineering design, with the goal of developing the student as a practitioner capable of solving complex problems within a given field. It is available in Chemical, Civil, Electrical, and Mechanical Engineering.

The graduate degree program includes a minimum of one-third year of design, and may include another one-third year of mathematics, basic science, and engineering design. A part of each program is the successful completion of a design project appropriate to the field.

Students should refer to the section of this catalog titled “Departmental Programs” for the admission, degree, examination, and course requirements unique to each department.

**Admission Requirements:**

1. A baccalaureate degree in an engineering or science field from an accredited university.
2. A minimum of 36 course hours of approved engineering coursework, including background work in the proposed area of concentration. Additional courses needed to satisfy the ABET requirement for basic level accreditation may be taken after admission.
3. The scholastic ability required for pursuing advanced academic work. A GPA of 2.50 (A = 4.00) for all previous academic work undertaken, or a GPA of 3.00 for the last two years of undergraduate work undertaken.
4. Scores from the General Test portion of the Graduate Record Examination if graduated from a non-accredited undergraduate program.

**Course Requirements.** The program of study for the M. Engr. degree must contain at least 30 credits, including at least 15 credits at the 500 level. An engineering design project must be completed and registered for through Engineering 595 for 3-6 credits. A written re-
port on this project is required. All major department courses must be at the 400 level or above, and no courses numbered below 300 may be included in the program.

**Residence Requirement.** There is no residence requirement for the M. Engr. degree; however, at least one-half of the credits for the degree must be taken on this campus. A maximum of eight credit hours may be transferred from another institution.

**Candidacy for the degree.** Admission of a student to the Graduate School 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 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 student has met the following requirements in approximately the following sequence:

1. Completion of the equivalent of one full-time semester (12 semester credits).
2. Attainment of a GPA of at least 2.75 for all work attempted.
3. The appointment of an advisor from the major department. The advisor, who must be a member of the Graduate Faculty, will be appointed by the Dean upon the recommendation of the chairperson of the student’s major department and the Dean of the School of Engineering and Mines. The advisor is responsible to the department and the Graduate School for the supervision of the student’s work.
4. Approval of a Program of Study on a form available from the Graduate School or from the Graduate School web site. The program, which should be developed in consultation with the advisor, early in the second semester, must be signed by the student, the advisor, the department chairperson (or designee), and the Dean of the School of Engineering and Mines, and must be submitted to the Dean of the Graduate School for approval.
5. Approval of a topic for the design project by having the advisor, department chairperson, and Dean of Engineering sign the Proposal of Design Project and submitting the Proposal to the Graduate School.

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 Examination.** Candidates for the Master of Engineering degree must pass written final comprehensive examination(s) which must cover the course material in the field of study. Such examinations generally will be given and evaluated by the major department, but the results must be certified to the Graduate School by the adviser and the department chairperson on the form Final Report on Candidate by the deadline specified in the Academic Calendar. The appropriate comprehensive examination(s) will be arranged by the advisor and given by the department no earlier than the semester preceding the semester in which the candidate intends to graduate. Comprehensive examinations which are failed may be repeated only with the prior approval of the advisor, the department, and the Dean of the Graduate School, but in no event earlier than at the next regularly scheduled offering.

**MASTER OF ENVIRONMENTAL MANAGEMENT**

(See Earth System Science and Policy under Departmental Programs)

**MASTER OF FINE ARTS**

(See Visual Arts under Departmental Programs)

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**MASTER OF MUSIC**

(See Music under Departmental Programs)

**MASTER OF PHYSICIAN ASSISTANT STUDIES**

(See Physician Assistant Studies under Departmental Programs)

**MASTER OF PUBLIC ADMINISTRATION**

(See Public Administration under Departmental Programs)

**MASTER OF SCIENCE IN APPLIED ECONOMICS**

(See Applied Economics under Departmental Programs)

**MASTER OF SOCIAL WORK**

(See Social Work under Departmental Programs)

**SPECIALIST DIPLOMA**

The Specialist Diploma is available only in the field of Educational Leadership. This program requires the equivalent of two full years of study beyond the bachelor’s degree or one full year of study beyond the master’s degree. The Specialist Diploma ordinarily is a terminal program of advanced preparation for professional practice.

**Admission Requirements:**

1. A master’s degree, normally in Educational Leadership.
2. Significant experience in teaching and administration.
3. A minimum of eighteen semester credits, including student teaching, of undergraduate preparation in Education.
4. A GPA of at least 3.50 for all graduate work completed.

**Course Requirements.** A minimum of 64 credits beyond the bachelor’s degree is required for the Specialist Diploma, including 4 credits for the Independent Study Report (997). One half of the credits for the diploma must be for courses numbered 500 or higher. The program in Educational Leadership will include an area of concentration of at least 40 credits, including at least 20 credits in Educational Leadership and one or two cognate areas totaling 12-24 credits.

**Students are referred to the section of this catalog entitled Department Programs for additional departmental requirements.**

**Residence Requirements.** Following the awarding of the master’s degree, all students must spend either one semester or one summer session in residence.

**Independent Study Report.** The independent study is designed to require the student 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.

The topic for an independent study must be approved by the student’s Advisory Committee. Approval is effected by the student’s completing a form titled Proposal for Independent Study, available with instructions from the Graduate School, then submitting the proposal to the Committee for approval. The proposal, which must be approved no later than the beginning of the semester or session in which the student expects to graduate, must be filed in the Graduate School before a student is advanced to candidacy.

A report of an independent study must be prepared and submitted to the Faculty Advisory Committee for approval. Three copies of the report (one each for the student, the advisor, and the department) must be accepted by the Faculty Advisory Committee who will certify completion of the report to the Graduate School by the deadline specified in the Academic Calendar. The advisor will submit a grade for 997-Independent Study to the Office of the Registrar.
Candidacy for the Diploma. Candidates for a Specialist Diploma will not be permitted to graduate in the same semester or summer session in which they become a candidate. Students in Approved Status may be advanced to candidacy for the Specialist Diploma when the following requirements have been fulfilled:

1. Completion of the equivalent of a full-time semester (12 semester credits) with a satisfactory GPA.
2. Appointment of a three-member Faculty Advisory Committee. This Committee is appointed by the Dean upon the written recommendation of the chairperson of the student’s major department. The chairperson of the Committee must be a Full member of the Graduate Faculty. Until the appointment of the Committee, the department chairperson, or designee, will act as the student’s temporary advisor.
3. Approval of a Program of Study for the diploma. The program is developed by the student and the Committee on a form available from the Graduate School. The program, which must carry the signatures of the student and the committee, is submitted to the Dean of the Graduate School for approval.
4. Approval of a Proposal for Independent Study on a form available from the Graduate School. This proposal, when approved by the Committee and filed in the Graduate School, indicates acceptance of the topic for study and incorporation in a report.
5. Completion of the required practicum or internship.
6. Completion of departmental testing requirements.

Students and their advisors will be notified in writing of advancement to candidacy.

Final Examinations. All students must pass written comprehensive examinations covering the program of work approved for the diploma. The examinations normally are given and evaluated by the department in the period 30 days before the Final Report deadline. Comprehensive examinations which are failed may be repeated only with the prior approval of the Advisory Committee, the department, and the Dean, but in no event earlier than at the next regularly scheduled offering.

Candidates may not take the final comprehensive examination(s) unless they have applied to receive the diploma, have been advanced to candidacy for the diploma, and have been certified, in writing, as eligible by the Graduate School.

DOCTOR OF ARTS

The Doctor of Arts (D.A.) degree program is designed to prepare teachers for four-year and two-year colleges in subject matter fields. The recipient of this degree must have demonstrated a command of knowledge in the broad field of the degree and an ability to teach the subject at the post-secondary level. This degree does not require the preparation of a dissertation but does require the student to obtain some experience in independent research and write a formal report thereon.

The D.A. degree is available only in the department of History. Only those persons holding a master’s degree in history or a closely related field are eligible for admission to a program leading to the D.A. degree.

Students should refer to the section of this catalog titled “Departmental Programs” for additional admission, degree, examination, and course requirements unique to each department.

Admission Requirements:
1. An overall GPA of at least 3.50 for all graduate work.
2. A master’s degree.
3. Scores on the general and advanced tests of the Graduate Record Examination if appropriate.
4. Recommendation for doctoral work by the department.

In History, a master’s degree with thesis is preferred, and the master’s program must have a minimum of fifteen semester hours of history at the graduate level. Acceptance of a student for doctoral work, on the basis of the above criteria, does not imply or guarantee advancement of the student to candidacy for the degree.

Program Requirements. The D.A. degree requires the completion of a program of 90 semester credits beyond the baccalaureate degree, including acceptable master’s work. The program of study for the degree, prepared with the assistance of the Faculty Advisory Committee, and approved by the Dean, will include:

1. A minimum of 60 credits of work in the discipline (the major) of which no more than 20 credits will be designated as an area of concentration. Included in the area of concentration will be a minimum of 5 credits of independent research.
2. A minimum of 10 credits in areas cognate to the major.
3. A minimum of 15 credits in college teaching. The majority of this work will be in a supervised teaching internship in the discipline and in work in the major department preparatory to the internship (seminars in college teaching, etc.).

With the approval of the student’s Committee and the Dean, up to one-half of the work beyond the master’s degree may be transferred from another institution.

Residence Requirement. At least two regular consecutive semesters of residence are required on the University of North Dakota campus.

Internship. A teaching internship during which the student is required to teach college-level courses under supervision is a necessary part of each student’s program. This teaching may be done at the University of North Dakota or at a cooperating institution. If done at a cooperating institution, the student will be under the joint supervision of a resident professor and the chairperson of the student’s Advisory Committee.

Research Project. All D.A. students must complete a research project and register for at least five semester credits. The project will be conducted under the direction of a member of the Faculty Advisory Committee, usually the chairperson, who is responsible for assigning a final grade. The proposed project must be approved by the Faculty Advisory Committee and the director of doctoral study of the department (if appropriate), and the Dean of the Graduate School. A copy will be filed with the department and the Graduate School.

A copy of the final DA research paper must be submitted to the Graduate School by the deadline published in the Academic Calendar (usually two weeks prior to graduation). The paper will be published by University Microfilms International and bound and deposited in the Chester Fritz Library. The paper must conform to the format guidelines of the Graduate School as published in the Style and Policy Manual for Theses and Dissertations.

Comprehensive Examination. A written comprehensive examination is required before advancement to candidacy for the D.A. degree. This examination must cover the broad field of the major and be prepared and evaluated by the Graduate Faculty of the student’s major department.

Students must apply for permission to take the comprehensive examination on a form available at the Graduate School. After checking the record to ensure that the student is eligible for the examination (most of the work completed, in Approved Status, Program of Study approved), the Graduate School will certify eligibility and will forward an examination report form to the chairperson of the student’s
Faculty Advisory Committee. The student may not take the examination until such certification has been provided. Comprehensive examinations which are failed may be repeated only with the prior approval of the Advisory Committee, the department, and the Dean, but in no event earlier than at the next regularly scheduled offering.

**Candidacy for the Degree.** Candidates for the D.A. degree will not be allowed to graduate in the same semester or summer session in which they become candidates.

Students in Approved Status may be advanced to candidacy when the following requirements have been fulfilled:

1. A three- or five-member Faculty Advisory Committee has been appointed. Committee members are appointed by the dean upon the written recommendation of the chairperson of the student’s major department. On five-member committees, the fifth member is appointed by the dean. Until the appointment of the committee, the department chairperson, or designate, acts as the student’s temporary advisor. The chairperson of the committee, who serves as the student’s major advisor, must be a Full member of the Graduate Faculty. The director of the student’s research project normally will be the chairperson of the committee.

2. A Program of Study, outlining the requirements for the degree as developed by the student and the committee, has been approved by the student, the committee, and the dean of the Graduate School. The program, executed on a form available from the Graduate School, should be developed no later than the beginning of the second semester of work.

3. Departmental examination requirements have been completed.

4. A substantial portion of the coursework for the degree has been completed with a GPA of no less than 3.0 for all work attempted.

5. The comprehensive examination has been successfully completed.

6. A Research Project has been approved as evidenced by filing an approved Research Proposal on a form available from the department.

7. The Advancement to Candidacy has been recommended by the student’s Faculty Advisory Committee.

The student and the advisor will be notified in writing of advancement to candidacy.

**Final Examination.** The final examination for the D.A. degree is conducted by the candidate’s full Faculty Advisory Committee. The examination will be oral and will be based on the area of concentration and the research project. Final examinations which are failed may be repeated only with the prior approval of the Advisory Committee and the dean.

Examinations are to be scheduled in advance by the Committee through the Graduate School. The results must be certified by the Committee on the Final Report form by the deadline specified in the Academic Calendar.

D.A. candidates will be required to complete a National Research Council demographic survey form and an agreement with University Microfilms, International, prior to graduation.

**DOCTOR OF EDUCATION**

The Doctor of Education (Ed.D.) degree is the highest University award given in recognition of the completion of academic preparation for professional practice in school teaching fields and in fields preparing school service personnel.

**Admission Requirements**

1. An overall GPA of at least 3.50 for all graduate work completed.

2. A master’s degree or the equivalent.

3. The necessary undergraduate preparation in the field.

4. Completion of any departmental examination requirements, i.e., qualifying or diagnostic examinations.

5. Scores on special tests required by the department.

6. Recommendation for doctoral work by the department concerned. Acceptance of a student for doctoral work, on the basis of the above criteria, does not imply or guarantee advancement of the student to candidacy for the degree.

Students should refer to the section of this catalog titled “Departmental Programs” for additional admission, degree, examination, and course requirements unique to each department.

**Program Requirements.** The Ed.D. degree requires the completion of a program of 96 semester credits beyond the bachelor’s degree, including acceptable master’s and specialist’s work, and the submission of an acceptable dissertation. The emphasis in the program is on courses and seminars to provide extensive knowledge of the field and will provide for the following:

1. Acquisition of broad knowledge in the area of concentration or major (at least 48 credits), in a cognate area, i.e., directly supportive of the area of concentration, and in the Foundations of Education (at least 12 credits).

2. Development of competencies in the scholarly tools required for study and practice in the field (normally 6 semester credits of statistics).

3. The preparation of a dissertation based on the investigation of a topic related to theory and practice in the professional field. The dissertation must demonstrate critical analysis, knowledge of the professional literature, and a familiarity with methods of research, all presented in a scholarly style. A maximum of ten semester credits may be assigned to the dissertation.

4. A period of professional practice in the form of a practicum or internship. At the discretion of the student’s Faculty Advisory Committee, this provision may be waived if the candidate has accumulated sufficient professional experience in the field prior to the completion of the doctoral program.

With the approval of a student’s committee, up to one-half of the work beyond the master’s degree may be transferred from another institution.

**Residence Requirement.** At least two consecutive semesters of residence or other options specified for the doctoral programs are required on the University of North Dakota campus.

**Dissertation.** Each candidate for the Doctor of Education degree must submit a dissertation to the Graduate School 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, which will be provided to each candidate when the program of study is approved. (Copies are also available at the Graduate School’s web site.)

The topic for the dissertation must be approved in advance by the student’s Faculty Advisory Committee. Approval is effected by the student’s completing a form titled Proposal of Dissertation, available from the Graduate School on the Graduate School web site, then
submitting the proposal to the committee for approval. The approved proposal must be filed in the Graduate School. The proposal should be approved before the degree is expected, but it must be completed before advancement to candidacy.

The draft of the dissertation should be presented to the Faculty Advisory Committee sufficiently in advance of the Preliminary Approval deadline that a thorough evaluation may be effected by the entire committee. The committee must be able to read the draft, suggest corrections and changes, and the student must be able to make the corrections, all in time for the committee to indicate its approval of the draft by signing a form titled Preliminary Approval of Dissertation. The student must deposit the approval form in the Graduate School by the deadline specified in the academic calendar (usually four weeks prior to commencement). The Preliminary Approval assures the student that no major changes will be required in the final copy of the dissertation. Copies of the dissertation in its final form must be presented to the Faculty Advisory Committee in time that they may thoroughly read the dissertation prior to the final examination. When the final version of the dissertation has been approved by the Committee, a copy must be deposited in the Graduate School in time to receive the approval of the Dean 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. One copy of a special abstract of the dissertation, in a 350-word format described in Style and Policy Manual for Theses and Dissertations, also must be presented with the dissertation. The abstract is published in Dissertation Abstracts by University Microfilms International, and the entire dissertation is microfilmed by the same organization. The Graduate School has the final copy of the dissertation bound and cataloged in the University Library.

Comprehensive Examination. All students seeking a Doctor of Education degree must take a written comprehensive examination after a substantial portion of the coursework has been completed. At the option of the department, an oral examination may also be given. The content of the examination will be determined by the Graduate Faculty of the departments concerned, and the examination will be given at times announced by the departments. The examination must be extensive and searching and cover in depth the field or fields of knowledge in which the degree is taken. This examination must be completed before advancement to candidacy for the degree but cannot be undertaken until the scholarly tool requirements have been completed. Comprehensive examinations which are failed may be repeated only with prior approval of the advisory committee, the department, and the dean, but in no event earlier than at the next regularly scheduled offering.

Students must apply for permission to take the comprehensive examination on a form available from the Graduate School. After checking the record to ensure that the student is eligible for the examination (most of the work completed, Approved Status attained, Program of Study approved, scholarly tool requirements completed), the Graduate School will certify eligibility and will forward an examination report form to the chairperson of the student’s Faculty Advisory Committee. The student may not take the examination until such certification has been provided.

Candidacy for the Degree. A student must fulfill all of the requirements for and be advanced to candidacy prior to the beginning of the semester or summer session in which he/she expects to receive a degree.

Students in Approved Status may be advanced to candidacy for a doctor’s degree when the following requirements have been fulfilled:

1. A five-member Faculty Advisory Committee has been appointed. Four committee members are appointed by the dean upon the written recommendation of the chairperson of the student’s major department and must represent the major and cognate areas of study. The fifth member is appointed by the Dean and represents the Graduate Faculty. Until the appointment of the committee, the department chairperson, or designate, acts as the student’s temporary advisor. The chairperson of the Committee, who serves as the student’s major and dissertation advisor, must be a Full member of the Graduate Faculty.

2. A Program of Study, outlining the requirements for the degree as developed by the student and the committee, has been approved by the student, the committee, and the dean of the Graduate School. The program, executed on a form available from the Graduate School, should be developed no later than the beginning of the second semester of work.

3. Departmental examination requirements have been completed.

4. A substantial portion of the coursework for the degree has been completed with a GPA of no less than 3.00 for all work attempted.

5. The scholarly tool requirement has been met.

6. The comprehensive examination has been successfully completed.

7. A dissertation topic has been approved as evidenced by filing an approved Proposal of Dissertation on a form available from the Graduate School.

8. Advancement to candidacy has been recommended by the student’s Faculty Advisory Committee.

The student and the advisor will be notified in writing of advancement to candidacy.

Final Examination. The final examination must be scheduled two weeks in advance by the committee through the Graduate School and must be completed and the results reported by the deadline specified in the Academic Calendar.

The final examination is conducted by the candidate’s full Faculty Advisory Committee in the presence of the dean of the Graduate School and such other members of the Graduate Faculty as elect to attend. The final examination will include an oral examination but also may include written portions. The examination will cover the dissertation but need not be limited thereto. Committee members must have had adequate opportunity to examine the final copy prior to the examination, and will indicate their approval by signing the Approval Page of the dissertation and the Final Report on Candidate. Final examinations which are failed may be repeated only with the prior approval of the advisory committee and the dean.

A student may pass the Doctoral comprehensive and/or Final Examination with one dissenting vote. The dissenter must submit a written report on his/her decision to the Graduate School. Four signatures will be accepted on the final copy of the dissertation.

Ed.D. candidates will be required to complete a National Research Council demographic survey form and an agreement with University Microfilms International before graduation.

DOCTOR OF PHILOSOPHY

The Doctor of Philosophy (Ph.D.) degree is awarded in recognition of the highest degree of creative scholarship and research in a field of study. The recipient of this degree must have demonstrated proficiency in a broad area of learning and the ability to critically evaluate work in the discipline. The degree is not awarded solely for completing a prescribed number of courses, but for having undertaken and completed independent work in the discipline leading to an original contribution to knowledge.
The Ph.D. degree requires the completion of a program of 90 semester credits beyond the baccalaureate degree and the submission of an acceptable dissertation. A substantial portion of the credits for the program must be devoted to independent research, the results of which are to be incorporated in the dissertation. It is expected that all or part of a Ph.D. dissertation will be publishable in the literature of the discipline and normally will be published. The program will include enrollment in courses and/or seminars which are designed to (a) advance the student’s knowledge in the discipline, (b) provide competence in the scholarly tools (languages, mathematics, etc.) required for study and research in the discipline, and (c) provide competence in the research methods of the discipline, e.g., courses in bibliography or historiography, a research minor in education, courses dealing with current research topics, etc.

Admission Requirements. Generally, students may undertake work that will lead to a Doctor of Philosophy degree only after they have received a master’s degree, usually in the same academic discipline, from this or another accredited institution; however, in some disciplines it is possible to be admitted directly to the Ph.D. program. In certain disciplines students who have completed the equivalent of the coursework for the master’s degree may be readmitted to work toward the Ph.D. directly, thereby bypassing the master’s degree (see department section). Each student must have: (1) attained an overall GPA of at least 3.00 for all graduate work, (2) completed the necessary undergraduate preparation, (3) completed any departmental examination(s) or other requirements, (4) presented scores on tests required by the department, and (5) been recommended for doctoral work by the department. Acceptance of a student for doctoral work on the basis of the above criteria does not imply or guarantee advancement of the student to candidacy for the degree.

Program Requirements. The Ph.D. degree requires the completion of a program of 90 semester credits of graduate work beyond the bachelor’s degree, including acceptable master’s degree work, and the submission of an acceptable dissertation. With the approval of the student’s Faculty Advisory Committee, up to one-half of the work beyond the master’s degree may be transferred from another institution. The program will include work in one major department and should include work in one or more related departments, i.e., either a minor or cognate area, but at least one-half of the work must be in the major field. The credits for the dissertation (typically 6-18 credits), and the research on which it is based, should comprise a substantial portion of the 90 credits for the degree and should be included in the major part of the program.

Students should refer to the section of this catalog titled “Departmental Programs” for additional admission, degree, examination, and course requirements unique to each department.

Residence Requirements. Since the Ph.D. is a research degree, the majority of the academic work must be conducted in an academic research environment. Accordingly, the program normally will include provision for two consecutive years of full-time academic work. In most instances this requirement will be met by two consecutive years of residence on the University of North Dakota campus. With prior written approval by the Dean, one of the two years of residence may be completed by one year of full-time academic work and/or research at another institution or location. Note: The Residence Requirement is in effect unless modifications have been granted to the department by the Graduate Committee.

Scholarly Tools. Candidates for the Ph.D. degree may have to demonstrate competence in scholarly tools required for study and research in the discipline. Each department offering the Ph.D. degree has specified the nature of these tools (languages, mathematics, statistics, computer programming, etc.). See the “Departmental Programs” section for more information. This requirement must be completed before the student is permitted to take the comprehensive examination for the degree or become a candidate for the degree.

Foreign Language Exam. Students required to demonstrate a reading knowledge of a foreign language may do so by one of two procedures: Standardized tests (Graduate Student Foreign Languages Tests - GSFLT) prepared by the Educational Testing Service are available in French, German, Russian, and Spanish and are given by the Counseling Center upon student request. The Languages Department will administer a Reading Test in French, German, Russian, or Spanish. This test is offered three times a year: on Reading and Review day at the end of the fall and spring semesters, and on registration day for the fall semester. Students must sign up for the examination with the department secretary, no later than one week before the examination date. Students may take the examination a maximum of three times at the Languages Department. Students needing to demonstrate a reading knowledge in a language other than those mentioned above should, together with their Advisory Committee, petition the Dean for approval of the use of the language and the proposed examination mechanism.

Dissertation. A dissertation is required in partial fulfillment of the requirements for the Ph.D. degree. It must represent an original and independent investigation in the major field of study. Through the dissertation, and the research leading to it, each candidate clearly must have made a significant contribution to the advancement of knowledge in the field. Credit is given for the dissertation and for the research on which it is based, the amount being determined in advance by the student’s Faculty Advisory Committee in accord with the limits established by the major department.

A dissertation is prepared with the guidance and advice of the student’s faculty advisor and the Committee. However, all dissertations must be prepared in accord with the Style and Policy Manual for Theses and Dissertations, a copy of which will be provided each candidate when advanced to candidacy. The Manual is also available on the Graduate School web site.

The topic for the dissertation must be approved in advance by the student’s Faculty Advisory Committee. Approval is effected by the student’s completing a form titled Proposal of Dissertation, available with instructions from the Graduate School and on the web site, then submitting the proposal to the committee for approval. The approved proposal is then filed in the Graduate School. The proposal should be approved the semester before the degree is expected, but it must be approved before advancement to candidacy.

The draft of the dissertation should be presented to the Faculty Advisory Committee sufficiently in advance of the Preliminary Approval deadline that a thorough evaluation may be effected by each committee member. The Committee must be able to read the draft, suggest corrections and changes, and the student must be able to make the corrections, in time for the Committee to approve the dissertation and sign a form titled Preliminary Approval of Dissertation. The student must deposit the Approval Form in the Graduate School by the deadline specified in the academic calendar (usually four weeks prior to commencement). Unless this deadline is met, the student will not be permitted to graduate at the upcoming graduation. The Preliminary Approval assures the student that no major changes will be required in the final copy of the dissertation.

Copies of the dissertation in its final form must be presented to the Faculty Advisory Committee in time that they may thoroughly read the dissertation prior to the final examination. When the final version of the dissertation has been approved by the committee, a copy must be deposited in the Graduate School in time to receive the approval of the Dean by the deadline specified in the Academic Calendar (usually two weeks prior to graduation). The advisor and the major department must each be presented one copy of the dissertation. One copy of a special abstract of the dissertation (in a 350-
Comprehensive Examination. All students seeking a Doctor of Philosophy degree must take a written comprehensive examination after a substantial portion of the coursework has been completed. At the option of the department, an oral examination may also be given. The content of the examination will be determined by the Graduate Faculty of the departments concerned, and the examination will be given at times announced by the departments. The examination must be extensive and searching and must cover in depth the field or fields of knowledge in which the degree is taken. This examination must be completed before advancement to candidacy but cannot be undertaken until the scholarly tool requirements have been completed. Comprehensive examinations which are failed may be repeated only with the prior approval of the Faculty Advisory Committee, the department, and the Dean, but in no event earlier than at the next regularly scheduled offering.

Students must apply for permission to take the comprehensive examination on a form available at the Graduate School. After checking the record to ensure that the student is eligible for the examination (most of the work completed, Approved Status attained, Program of Study approved, scholarly tool requirements completed), the Graduate School will certify eligibility and will forward an examination report form to the chairperson of the student’s Faculty Advisory Committee. The student may not take the examination until such certification has been provided.

In lieu of the comprehensive examination, students in Chemistry will take cumulative examinations which begin in the second semester of graduate school. Chemistry students will not be required to apply for permission to take the comprehensive.

Candidacy for the Degree. Advancement to candidacy is granted only after the completion of specified academic requirements and upon the recommendation of the Faculty Advisory Committee. Candidates for a doctor’s degree will not be allowed to graduate in the same semester or summer session in which they become a candidate for the degree.

Students in Approved Status may be advanced to candidacy when the following requirements have been fulfilled:

1. A five-member Faculty Advisory Committee has been appointed. *Four committee members are appointed by the dean upon the written recommendation of the chairperson of the student’s major department to represent the major and any minor areas of study. The fifth member is appointed by the dean and represents the Graduate Faculty. Until the appointment of the committee, the department chairperson, or designate, acts as the student’s temporary advisor. The chairperson of the Committee, who serves as the student's major and dissertation advisor, must be a Full member of the Graduate Faculty. An associate member may chair a doctoral student’s faculty advisory committee and direct the dissertation research if approved by the Dean of the Graduate School and is under the direction of a mentor appointed by the Dean of the Graduate School. *Teaching and Learning has four-member Faculty Advisory Committees.

2. A Program of Study, outlining the requirements for the degree as developed by the student and the Committee, has been approved by the student, the Committee, and the Dean of the Graduate School. The program, executed on a form available from the Graduate School, should be developed no later than the beginning of the second semester of work.

3. Departmental examination requirements have been completed.

4. A substantial portion of the coursework for the degree has been completed with a GPA of no less than 3.00 for all work attempted.

5. The scholarly tool requirement has been completed.

6. The comprehensive examination has been successfully completed.

7. A dissertation topic has been approved as evidenced by filing an approved Proposal of Dissertation on a form available from the Graduate School.

8. Advancement to candidacy has been recommended by the student’s Faculty Advisory Committee.

The student and the advisor will be notified in writing of advancement to candidacy.

Final Examination. The final examination must be scheduled two weeks in advance by the Committee through the Graduate School and must be completed and the results reported by the deadline specified in the Academic Calendar.

The final examination for the doctoral degree is conducted by the candidate’s full Faculty Advisory Committee in the presence of the dean of the Graduate School and such other members of the Graduate Faculty as elect to attend. The final examination must include an oral examination but also may include written portions. The examination must cover the dissertation but need not be limited thereto. Committee members must have had adequate opportunity to examine the final copy prior to the examination and will indicate their approval by signing the “Approval Page” of the dissertation and the “Final Report on Candidate.” Final examinations which are failed may be repeated only with the prior approval of the Advisory Committee and the Dean.

A student may pass the Doctoral Comprehensive and/or Final Examination with one dissenting vote. The dissenter must submit a written report on his/her decision to the Graduate School. Four signatures will be accepted on the final copy of the dissertation.

Ph.D. candidates will be required to complete a National Research Council demographic survey form and an agreement with Proquest UMI before graduation.

DOCTOR OF PHYSICAL THERAPY
(See Physical Therapy under Departmental Programs)

Joint M.D. - PH.D. Program

Through the cooperation of the Graduate School 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 graduate school 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 Graduate School 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 Graduate School his/her satisfactory completion of the first two years of the M.D. program.

Students are expected to complete the following general requirements for the Ph.D. degree in a medical science field:

1. Performance of original research of a quality suitable for publication in refereed, professional journals.

2. Pass final examination which includes preparation and oral defense of a satisfactory dissertation.

3. Completion of BIMD 512 and 513.

4. A minimum of 90 credit hours, including research and dissertation.

5. Successful completion of a scholarly tool (Note: May be specified by a department.)

6. Completion of the first two years of the medical education curriculum, transferred as 44 credits toward the Ph.D.

7. Passing comprehensive examinations covering the coursework in the major area.

MINORS AND COGNATES

Some degree programs require or permit academic work outside of the area of concentration (major) in a supporting area which may be called a minor area, which must consist of at least nine credit hours, or a cognate area, which must consist of at least six credits. Credits earned toward a 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, if the minor has been approved by the State Board of Higher Education. Only the 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 committee member must be on the student’s committee 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. 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 at the 300-400 level cannot be used as a cognate area.

The student’s major should consist of 500 level courses or courses that have been approved for graduate credit. The courses that have been approved for graduate credit are listed in the graduate section of the academic catalog after the department listings of the 500 level courses.

NOTE: When a graduate student elects to use a 300 or 400 level course for graduate credit that is outside of their major, 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. For example, if an additional research project or paper is assigned to graduate students, students may be required to explain an area of interest in greater depth than what is required of an undergraduate.

Aerospace

Courses

530. Advanced Earth System Sciences. 3 credits. Prerequisites: AtSc 505 or equivalent and AtSc 525 or equivalent for Atmospheric Sciences graduate students; SpSt 430 for Space Studies graduate students; or permission of instructor. 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.

Anatomy and Cell Biology

Professors: Atkinson, Carlson (Chair), Carr, Dunlevy, Grove, Jackson, Liu, Rieke, Ruit (Graduate Director) and Watt

Adjunct Professor: Hunt

Program Description

The graduate program of the Department of Anatomy and Cell Biology leads to the degrees of Master of Science and Doctor of Philosophy. The program is designed to prepare scholars for academic teaching and research, or for careers in a variety of organizations that carry on research and development in biologically or medically related areas. Research facilities and expertise are available in the department in transmission and scanning electron microscopy, developmental biology, reproductive biology, neurosciences, tissue culture, immunohistochemistry, and molecular biology.

Admission Requirements

1. An overall undergraduate GPA of at least 3.00.


3. A year-long sequence of General Chemistry.

4. A course in Organic Chemistry, a course in College Algebra or the equivalent, and a course in Morphology, e.g., Human Anatomy, Comparative Anatomy, Embryology, Histology; courses in Cell Biology, Biochemistry, and Genetics are also recommended.

5. Scores from the GRE General Test and/or the MCAT must be submitted. The GRE Subject Test is not required, but applicants are encouraged to submit those scores if they have taken the test.

6. Admission to the Anatomy and Cell Biology graduate program can be made either through the M.S. degree program or by application directly to the Ph.D. degree program. Students who elect to begin the M.S. degree program and later decide they wish to pursue the Ph.D. degree may choose to attempt to by-pass the M.S. degree by taking a Diagnostic/Qualifying examination. Such an examination is administered by a departmental committee and consists in part of the preparation of a written research proposal by the student, with an oral defense of that proposal. By
passing it and by meeting other requirements, such as a GPA of 3.5 or higher in graduate level coursework, a student may be admitted to the Ph.D. program without completing the M.S. program. Otherwise, a student admitted to the M.S. program must complete the degree as listed.

Other departmental requirements for admission include an overall GPA of 3.50 in previous graduate work and appropriate letters of reference.

**Degree Requirements**

**Master of Science**

1. Minimum of 35 semester hours of graduate credit (can be completed in four full semesters and one summer session).
2. Completion of the following core graduate level courses:
   - BIMD 500 Cellular and Molecular Foundations of Biomedical Science 6 cr
   - BIMD 510 Basic Biomedical Statistics 2 cr
   - BIMD 513 Seminars in Biomedical Science 1 cr
   - BIMD 515 Steps to Success in Graduate School 1 cr
   - BIMD 516 Responsible Conduct of Research 1 cr
   - ANAT 505 Seminar in Anatomy and Cell Biology 1 cr
   - ANAT 515 Histology 3 cr
   - ANAT 518 Developmental Biology and Human Embryology 6 cr
   - ANAT 593 (Research) and ANAT 998 (Thesis) 14 cr
   - Total minimum credits 35 cr
3. A thesis written on an independent research problem.

**Doctor of Philosophy**

1. A minimum of 90 semester hours of graduate credit (can be completed in eight full semesters and four summer sessions).
2. Completion of the following core graduate level courses:
   - BIMD 500 Cellular and Molecular Foundations of Biomedical Science 6 cr
   - BIMD 510 Basic Biomedical Statistics 2 cr
   - BIMD 513 Seminars in Biomedical Science 1 cr
   - BIMD 515 Steps to Success in Graduate School 1 cr
   - BIMD 516 Responsible Conduct of Research 1 cr
   - ANAT 515 Histology 3 cr
   - ANAT 518 Developmental Biology and Human Embryology 6 cr
   - Choice of:
     - ANAT 513 Gross Anatomy 7 cr
     - ANAT 522 Neuroscience 6 cr
   - ANAT 505 Seminar in Anatomy and Cell Biology 1 cr
   - ANAT 593 (Research) and ANAT 999 (Dissertation) 62-63 cr
   - Total minimum credits 90 cr
3. A scholarly tool, the requirement for which is usually fulfilled by completing Computer Science 101/101L or Anatomy 591 (or their equivalents).
4. Teaching experience in one of the following:
   a. Gross Anatomy for Medical Students, for Graduate Students or for Physical/Occupational Therapy Students.
   b. Histology for Medical Students or for Graduate Students.
   c. Neuroscience for Graduate Students.
5. A dissertation written on an independent research problem.

The department accepts USMLE. Step 1 as the Diagnostic/Qualifying Examination for medical students entering the M.D./Ph.D. program. Students must pass USMLE, Step 1 of the examination.

**Courses**

**BIMD 500. Cellular and Molecular Foundations of Biomedical Science.** 6 credits. A series of lectures and discussion groups with emphasis on interrelated themes in basic biochemistry, cell biology and molecular biology. Lectures will include current and emerging areas of research, while discussion will center on methods, techniques and expansion of lecture topics. Fall semester. Prerequisites: (a) a year of organic chemistry or (b) one semester of organic chemistry plus a course in either biochemistry or cell biology, or (c) permission of the course director.

**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. Spring Semester.

**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 515. Steps to Success in Graduate School.** 1 credit. A series of lectures and discussion sessions covering topics related to the development of skills and experience important for successful completion of graduate training and transition to post graduate training and employment. Students will examine a variety of issues including choosing an advisor and research topic, charting their course through graduate school, the importance of productivity, how to give a scientific presentation and write a scientific publication, applying for predoctoral grants, and planning for their careers.

**BIMD 516. Responsible Conduct of Research.** 1 credit. 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.

**BIMD 510. Biomedical Information Retrieval.** 1 credit. SU grading only. Offered every session either in a group setting or on an individual basis. 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.

**BIMD 515. Seminar in Anatomy and Cell Biology.** 1 credit. This course provides students with 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.

**BIMD 513. Gross Anatomy.** 17 credits. This course consists of lectures and laboratory experience providing opportunity for understanding the structure and function of the adult human body. Laboratory work consists of the complete dissection of the human body, study of topographic relations of organs and structures, and the study of normal radiographic anatomy.

**BIMD 515. Histology.** 3 credits. A series of laboratory sessions providing a comprehensive study of normal light and electron microscopic structure of cells, tissues, and organs of the body. An introduction to cell and tissue pathology also will be included. Laboratory sessions will include utilization of microscopic tissue slides, video and digital images, student presentations and discussion with faculty.

**BIMD 518. Developmental Biology and Human Embryology.** 16 credits. Prerequisite: BIMD 513 or equivalent. A problem-based course in principles of development and human embryology. Topics to include cellular and molecular mechanisms of fertilization, early development, gastrulation and organogenesis. Course will involve student presentations, discussion and laboratory exercises.

**BIMD 522. Neuroscience.** 6 credits. This course is designed to introduce the student to the study of the structure and function of the nervous system with relevant experimental and clinical application. Lectures, discussion, student presentations and laboratory work address historical as well as current advances in cellular, molecular, developmental, sensorimotor, regulatory and cognitive neurobiology, preparing the student for further, more advanced study of the nervous system.

**BIMD 590. Readings in Anatomy and Cell Biology.** 1 to 3 credits. Students may elect to do a "readings" project with any of the members of the departmental faculty, in areas related to the faculty member’s research field.

**BIMD 591. Special Topics in Anatomy and Cell Biology.** 1 to 3 credits. Prerequisite: Permission of the instructor. A series of lectures, discussions and/or laboratory experiences developed around a specific topic in the anatomical or cell biological sciences.

**BIMD 939. Research in Anatomy and Cell Biology.** Credits arranged. 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.

**BIMD 595. Advanced Gross Anatomy.** Credits arranged, with a maximum of six credits. Prerequisite: Anatomy 513 or equivalent. The work of the course consists of the preparation of regional dissections, made under the direction of an instructor.

Available to students registering in graduate degree programs in the biomedical sciences or by permission of the instructor.
Arts and Sciences
(A & S)

The College of Arts and Sciences offers one non-departmental course at the graduate level, Arts and Sciences 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. Arts and Sciences 599 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 Arts and Sciences 599 should present their proposals in writing to the Dean of the College. See the Arts and Sciences website (http://www.und.edu/dept/artscl/) for the appropriate A&S course request forms.

Courses

599. 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.

Applied Economics

Professors Bagheri, Biederman (Graduate Director), Blackwell, Chen, da Silva, Flynn, Goenner, Mialon and O'Neill

Program Description

The Master of Science in Applied Economics (MSAE) reflects the current state of knowledge and skills used by professional economists. It is characterized by strong foundational courses in economic theory, mathematical economics and advanced statistical methods. It is focused on specialized areas of study serving, but not limited to, North Dakota and the North Central Region.

The MSAE is about preparing graduates to do real-world economic research. Their formal studies will broadly prepare them in research methods applied to at least one specialized area such as economic development or business economics. Additionally, they will actively participate in research projects, both in their classes and through the Bureau of Business and Economic Research (BBER) and all will have the opportunity to participate in a research internship.

Admission Requirements

1. Completion of Econ 201, 202, 210, 303, 308, and 309; Math 146, or equivalents, with grades of “B” or better in each course.
2. An overall undergraduate grade point average of 3.0 or greater.
3. Qualified applicants for the combined program must have completed at least 90 semester hours in a bachelor’s program (the combined option allows outstanding undergraduates to enter the MSAE prior to receiving their bachelor’s degree, making it possible to complete both a bachelor’s degree and the MSAE in five years.)
4. Applicants who already hold bachelor’s degrees are required to submit official scores from the Graduate Record Examination (GRE) General Test taken within the last three years.
5. All MSAE applications must be completed through the Graduate School of the University of North Dakota. The MSAE Committee will select the most qualified applicants for admission.

6. Econ 410 and 411 are the two courses that students in the combined program are permitted to count toward both a UND bachelor’s degree and the MSAE degree, but only if these courses are declared for graduate credit. All other courses taken for credit in the combined program must satisfy only bachelor’s program requirements, or only MSAE program requirements.

7. A minimum TOEFL (Test of English as a Foreign Language) score of 550 for the paper-based or 213 for the computer-based test for all applicants whose native language is not English. 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.

Degree Requirements

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 want to produce an original contribution to knowledge. 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 non-thesis option requires the Economics Research Internship (Econ 597) and the student completes an independent study as opposed to a thesis. The independent study must demonstrate the student’s ability to do independent research, 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 Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 410</td>
<td>Empirical Methods in Economics I</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 411</td>
<td>Empirical Methods in Economics II</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 416</td>
<td>Mathematics for Economists</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 504</td>
<td>Advanced Price Theory</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 505</td>
<td>Advanced Macroeconomic Theory</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 524</td>
<td>Applied Economic Analysis I</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 534</td>
<td>Applied Economic Analysis II</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 998</td>
<td>Thesis</td>
<td>4 credits</td>
</tr>
</tbody>
</table>

Electives (minimum of 6 credit hours): 3:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 324</td>
<td>Public Finance</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 338</td>
<td>International Economics</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 341</td>
<td>Labor Economics</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 355</td>
<td>Government Regulation of Business</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 438</td>
<td>International Money and Finance</td>
<td>3 credits</td>
</tr>
<tr>
<td>Fin 501</td>
<td>Managerial Finance</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 514</td>
<td>Managerial Economics</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 575</td>
<td>Advanced Special Topics</td>
<td>2-4 credits</td>
</tr>
<tr>
<td>Econ 580</td>
<td>Economic Development</td>
<td>3 credits</td>
</tr>
<tr>
<td>Econ 597</td>
<td>Economics Research Internship</td>
<td>3 credits</td>
</tr>
</tbody>
</table>

1 Some thesis topics may require additional time.
2 Electives serve to focus on particular specialties. Choices of electives must be determined in consultation with and approved by the MSAE program director.
3 Courses previously taken 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>
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<td>3 credits</td>
</tr>
</tbody>
</table>
Econ 416 .... Mathematics for Economists ......................... 3 credits
Econ 504 .... Advanced Price Theory ................................ 3 credits
Econ 505 .... Advanced Macroeconomic Theory .................. 3 credits
Econ 524 .... Applied Economic Analysis I ........................ 3 credits
Econ 534 .... Applied Economic Analysis II ........................ 3 credits
Econ 597 .... Economics Research Internship ...................... 3 credits
Econ 997 .... Independent Study ....................................... 2 credits

Electives (minimum of 6 credit hours): 2:

Econ 324 .... Public Finance .......................................... 3 credits
Econ 338 .... International Economics ............................... 3 credits
Econ 341 .... Labor Economics ........................................ 3 credits
Econ 355 .... Government Regulation of Business .................. 3 credits
Econ 438 .... International Money and Finance .................... 3 credits
Fin 501 .... Managerial Finance ....................................... 3 credits
Econ 514 .... Managerial Economics ................................... 3 credits
Econ 575 .... Advanced Special Topics ................................ 2-4 credits
Econ 580 .... Economic Development ................................. 3 credits

1 Electives serve to focus on particular specialties. Choices of electives must be determined in consultation with and approved by the Department of Economics MSAE program director.

2 Courses previously taken for undergraduate credit may not be used to satisfy MSAE requirements.

Courses

504. Advanced Price Theory. 3 credits. Prerequisites: Econ 308 and 416. 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.

505. Advanced Macroeconomic Theory. 3 credits. Prerequisites: Econ 309 and 416. 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.

514. Advanced Managerial Economics. 3 credits. Prerequisite: Econ 201, ISys 217 and Math 446, or permission of the instructor. 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.

524. Applied Economic Analysis I. 3 credits. Prerequisites: Econ 410, 411, 416 and 505. Studies of economic impact, with emphasis on defined area employment, income, tax base, infrastructure and business feasibility. Students will be expected to design and complete studies of professional quality using the tools of economic theory and econometrics, including input-output analysis and gravity/entropy models.

534. Applied Economic Analysis II. 3 credits. Prerequisites: Econ 410, 411, 416 and 504. Economic theory and econometric methods are applied to typical business problems. Examples include cost estimation, product demand, learning models, scale and size economies, quality change, wage determination and discrimination, investment expenditure, public utility demand, advertising, factor requirements and optimization of factor use.

575. Advanced Special Topics. 2-4 credits. Specific area varies from year to year; some years an important aspect of economic theory; other years, a significant issue in economic policy.

580. Economic Development: Global, National, and Regional Issues. 3 credits. Prerequisites: Econ 504 and 505. 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.

597. Economic Research Internship. 3 credits. MSAE students are required to participate in a research internship unless they have chosen the thesis option. Interns may be assigned to governmental agencies, businesses, community organizations or partnered with faculty members engaged in research.

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 MSAE program director.

998. Thesis. 4 credits. The thesis is an original research project completed under the supervision of a thesis committee.

324. Public Finance. 3 credits.

338. International Economics. 3 credits.

341. Labor Economics and Labor Relations. 3 credits.

355. Government Regulation of Business. 3 credits.


416. Mathematics for Economists. 3 credits.

438. International Money and Finance. 3 credits.

Art

(See Visual Arts)

Atmospheric Sciences

Professors: Askelson, Dong, Grainger, Osborne (Graduate Program Director), Mewes and Poellot (Chair)

Program Description

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 graduate 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.

Admission Requirements

Master of Science

1. A bachelor’s degree from a recognized college or university.
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).

Doctor of Philosophy

Students seeking approved admission status to the University of North Dakota Department of Atmospheric Sciences Ph.D. program are subject to the admission requirements set forth by the Graduate School. In addition, the following requirements must be met:

1. A master’s degree from an accredited institution, normally in the field of proposed specialist or doctoral study.
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 1050 in the quantitative and verbal sections of the Graduate Record Examination (GRE).

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

Master of Science

The Master of Science program requires that students complete a minimum of 30 credit hours for the thesis option or a minimum of 32 credit hours for the non-thesis option. Approval of the thesis option will be granted based upon alignment of research interests with departmental faculty’s research interests and faculty availabil-
ity. 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 may not be an original contribution to knowledge, but may be a presentation, analysis, and discussion of ideas already in the literature of the field. The non-thesis requirement is to ensure that the student 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 below in addition to completing AtSc 500, Introduction to Atmospheric Research. Non-thesis option students must also complete two credits of 997, Independent Study Report.

Dynamics:
AtSc 505: Advanced Atmospheric Dynamics
AtSc 518: Advanced Synoptic Meteorology
AtSc 548: Advanced Mesoscale Dynamics

Physical:
AtSc 450: Introduction to Cloud Physics Meteorology**
AtSc 520: Atmospheric Chemistry
AtSc 525: Atmospheric Radiation
AtSc 555: Advanced Surface Transportation Weather
AtSc 560: Boundary Layer Meteorology
AtSc 565: Air Quality

Climate System:
AtSc 510: General Circulation
AtSc 515: Advanced Climatology
AtSc 545: Hydrometeorology
AtSc 550: Tropical Meteorology
AERO 530: Advanced Earth System Science

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

**Courses taken at the undergraduate level cannot be repeated for graduate credit.

Doctor of Philosophy

Students seeking the Doctor of Philosophy through the Department of Atmospheric Sciences 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 Department of Atmospheric Sciences. The particular requirements of the Department of Atmospheric Sciences are:

1. Two consecutive years of full-time academic work completed in residence at the University of North Dakota campus. With approval of a student’s Faculty Advisory Committee, one of these years may be completed through full-time academic work and/or research at another institution or location.
2. At least 27 of the post master’s credits must be class credits.
3. At least 18 of the 27 class credits must be taken within the Department of Atmospheric Sciences.
4. Up to 9 of the post master’s credits may be taken through distance education.
5. Completion of AtSc 500 and 505 or equivalent classes.
6. A departmental seminar on dissertation research topic.

Students are required to complete coursework, a comprehensive examination, and independent research that culminates in a dissertation, seminar, and final examination.

Courses

ATMOSPHERIC SCIENCES

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 only.

505. Advanced Atmospheric Dynamics. 3 credits. A graduate level course in linear perturbation theory, atmospheric oscillations, hydrodynamic instability and the life cycle of extratropical cyclones.

510. General Circulation. 3 credits. Prerequisite: AtSc 505. 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.

515. Advanced Climatology. 3 credits. Prerequisite: AtSc 540. 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.

518. Advanced Synoptic Meteorology. 3 credits. Prerequisite: AtSc 505 or equivalent. Advanced analysis of atmospheric processes important to large-scale flows. Quasi-geostrophic and semi-geostrophic theory, behavior of extratropical systems, fronts and jets, geostrophic adjustment, blocking and IPV thinking.

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, ozone depletion, etc.


528. Atmospheric Data Analysis. 3 credits. Prerequisite: Proficiency in a programming language. 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.

530. Numerical Weather Prediction. 3 credits. Prerequisite: AtSc 505. 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.

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, measurement systems, and digital data logging and processing.

540. Statistical Methods in Atmospheric Science. 3 credits. Prerequisite: Must have completed coursework in statistics or consent of instructor. 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 predication and verification.

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.

548. Advanced Mesoscale Dynamics. 3 credits. Prerequisite: Upper division or graduate course in dynamics or consent of instructor. Corequisites: AtSc 505 recommended, but not required. 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.

550. Tropical Meteorology. 3 credits. Prerequisites: Graduate standing. 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.

555. Advanced Surface Transportation Weather. 3 credits. Prerequisite: AtSc 510 or consent of instructor. 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 transport-
tation environment.

560. Boundary Layer Meteorology 3 credits. Prerequisite: AtSc 505. The inter-
action 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 tur-
bulence and the effects of turbulence on the transfer properties of the atmosphere.

565. Air Quality 3 credits. Prerequisites: Chem 121 or equivalent and Phys 251 or
equivalent. An in-depth introduction to important areas within the air quality field.
Topics covered include the physical and chemical nature of air pollutants; their sources,
control, and transport through the atmosphere; their interaction with other atmospheric
constituents; their removal through cloud processes, fallout and wet deposition; their
effects on visibility, human health, ecosystems, and global climate. Methods related to
the measurements of atmospheric pollutants, air quality modeling, and air quality fore-
casting are discussed.

570. Seminar 1 credit, repeatable to 3. 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.
S/U grading only.

575. Current/Special Topics in Meteorology 3 credits, repeatable to 12. A course
in specific advanced topics in atmospheric sciences. Largely done in a structured, lec-
ture format. Special topics will likely include (but not be limited to): satellite meteorol-
ogy, atmospheric turbulence, mesoscale meteorology, convective and planetary bound-
ary layer, chemical and aerosol measurement systems, tropical meteorology, atmospheric
electricity, hydrometeorology, and radiative transfer modeling.

594. Independent Studies 2 credits, repeatable to 4. Survey investigations, lit-
erature searches and preliminary research topic of interest to the student.

599. Supervised Research 1 to 4 credits, repeatable to 12. Prerequisite: consent
of the instructor. Research in consultation with departmental faculty. S/U grading only.

997. Independent Study Report (Non-thesis option) 2 credits. Prerequisite: Students
are required to complete at least one course from each of the core areas: dynam-
ics, physical, earth system, and tools, as well as AsSc 500. This course is required for all
Atmospheric Science graduate students enrolled in the non-thesis option. Students
will be required to independently investigate a topic related to the major field. This
study need not be an original contribution to knowledge, but may be a presentation,
analysis, and discussion of ideas already in the literature of the field. S/U grading only.

998. Thesis 1 to 6 credits, repeatable to 9.

441. Radar Meteorology 4 credits.

450. Introduction to Cloud Physics Meteorology 4 credits.

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**Aviation**

**Professors:** Jensen, Kenville, Lindsey, Marshall (Graduate Program Director), Robertson,
Smith and Watson

**Program Description**

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 profes-
sionals 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 solve problems within the aviation industry. The graduate program will provide the graduates with the knowledge and skill that prepare them for the aviation industry, aviation related government jobs and for further research and development in the field of aviation.

**Admission Requirements**

1. A Bachelor’s degree in Aviation/Aeronautics
   or
   A Bachelor’s degree from an accredited institution and 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. Hold a minimum of a Federal Aviation Administration
   Private Pilot Certificate or its foreign equivalent.

5. Students must submit a 2-3 page paper answering specific
   questions per departmental guidelines. One of the ques-
   tions will address the potential thesis or independent study
   topic.

**Degree Requirements**

1. Required Core Courses are as follows:
   AVIT 501 ... General Issues in Aviation/Aerospace 3 credits
   AVIT 502 ... Aviation Economics 3 credits
   AVIT 503 ... Statistics 3 credits
   AVIT 504 ... Research Methods 3 credits
   AVIT 595 ... Capstone Course 3 credits
   AVIT 997 ... Independent Study 2 credits
   AVIT 998 ... Thesis 4 credits

2. A minimum of 30 credit hours for the thesis option or a
   minimum of 32 credit hours for the independent study
   option. Approval of the thesis option will be granted based
   upon alignment of research interests with departmental
   faculty’s research interests and faculty availability.

3. Comprehensive exams are required for those choosing the
   Independent Study option.

4. Courses 510 - 520 should be taken after the required “core”
   courses are completed.

5. Follow the Graduate Catalog and Graduate Student Hand-
   book: Master’s Degree for completion of:
   a. Program of Study
   b. Advisor selection
   c. Independent Study/Thesis Option
   d. Topic Proposal

6. Aviation 590 and 593 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 select
   elective courses from the following list to complete the
   degree:
   AVIT 510 ... Aviation Public Policy and Regulations 3 credits
   AVIT 511 ... Aviation Information Technology 3 credits
   AVIT 512 ... Aviation Environmental Concerns 3 credits
   AVIT 513 ... Advanced Aviation Safety Management 3 credits
   AVIT 514 ... Aviation Management Theory 3 credits
   AVIT 515 ... Human Factors: Human Perception
   in the Aerospace Environment 3 credits
   AVIT 516 ... Human Factors: Memory, Learning
   and Judgment 3 credits
   AVIT 517 ... Airline Labor Relations and Law 3 credits
   AVIT 520 ... Strategic Airport Planning 3 credits
   AVIT 587 ... Supervised Field Work 1-3 credits
   AVIT 590 ... Aviation Seminar 1-3 credits
   AVIT 593 ... Individual Research in Aviation 1-3 credits

**Courses**

501. General Issues in Aviation/Aerospace 3 credits. This course is designed to
   explore the historical, current and future issues related to the aerospace industry.
   Course will include issues pertaining to legal, environmental, regulatory, and current
   events shaping the industry.

502. Aviation Economics 3 credits. Prerequisites: Econ 201 or 202. 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
   airport businesses. Topics include: basic economics of air transport supply and demand;
   demand forecasting; cost drivers; network structures and strategies; ratemaking; yield;
   revenue and capacity management; regulatory issues; political influences; unique econ-
   omic characters of international commercial aviation; capitalization and credit facili-
   ties; economic and structural analytical tools and models.

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 proce-
504. Research Methods. 3 credits. Prerequisites: Avit 503. Methods and procedures of research design and analysis related to aviation industry research. Topics include problem identification, research design, survey techniques, and data analysis. The course includes the experience of critically evaluating research projects and developing a research project based on the principles discussed in class.

510. Aviation Public Policy and Regulations. 3 credits. This course examines the historical basis for aviation public policies and the formulation and implementation of the Federal Aviation Regulations pertaining to commercial and general aviation. Students will discuss the evolution of the regulatory process in the context of the public policy underlying its need, and will be provided the tools to not only operate within that environment, but to influence future public policy.

511. Aviation Information Technology. 3 credits. This course will focus on a variety of information technology systems that are in use and their impact on successful operations within the aviation industry. An overview of current and emerging technologies in reservation systems, aircraft productivity modeling, air traffic control systems and various database, data communication and e-commerce systems will be explored.

512. Aviation Environmental Concerns. 3 credits. Prerequisite: Avit 501. An in-depth study of the environmental concerns within the aviation industry and an overview of the laws and regulations that impact these issues will precede an operational research experience where students will have the opportunity to work on an ongoing environmental project in conjunction with aviation industry professionals. Students will work with consultants, government officials, and other stake-holders in an effort to resolve an aviation environmental problem.

513. Advanced Aviation Safety Management. 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.

514. Aviation Management Theory. 3 credits. An in-depth review of organization 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 levels within the management of an airline, general aviation, corporate aviation and airports.

515. Human Factors: Human Perceptions in the Aerospace Environment. 3 credits. Human perception and physiology will be discussed in relation to information system design requirements to optimize human performance. Topics include information system designs to support human eye movement, attention and auditory systems. Application of perception principles to workstation and information system design will allow the student to have a greater understanding of human-centered automation goals.

517. Airline Labor Relations and Law. 3 credits. This course will examine the impact and application of the Railway Labor Act and the National Labor Relations Act as they pertain to airline operations. Other legal issues pertaining to the airlines will include consumer protection; anti-trust & monopolies; FAA enforcement procedures and regulatory compliance; multi-district air disaster litigation; Warsaw Convention and international law and treaties; Environmental Protection Act regulations; product liability; and workers compensation.

520. Strategic Airport Planning. 3 credits. Prerequisite: Avit 501 and 502. 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.

587. Supervised Field Work. 1-3 credits. May be repeated for up to 6 credits. Prerequisite: consent of graduate director. Used primarily for individualized field placement so that the student may acquire practical experiences in the aviation industry. SU grading.

590. Aviation Seminar. 1-3 credits. A series of lectures presented by visiting lecturers and the faculty. May be repeated for up to 4 credits.

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 and may be repeated for up to 6 credits.

595. Aviation Capstone. 3 credits. Prerequisites: Avit 514 or permission of the instructor. 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 the management theories relevant to the aviation industry and how leaders apply these theories in practice. Students will have an 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.

997. Independent Study. 2 credits. Prerequisite: Avit 504. Independent study and preparation of a written report for students taking the non-thesis option in the Master’s program.

998. Thesis. 4 credits. Prerequisite: Avit 504. Preparation and defense of a thesis based on original research. Admissions committee approval and consent of instructor required.
4. A grade of “B” or better in BIMD 500.
5. Completion of BIMD 510, 513, 515 and 516.
6. Completion of 6 credits of BMB 533.
7. Completion of two credits each of Biochemistry 514 and 521.
8. An overall GPA of at least 3.0.
9. At least 6 credits of formal coursework outside of the department.
10. Passing performance on oral and written comprehensive examinations covering the coursework in the major and related areas.

Work completed for the master’s degree program may be incorporated into the doctoral program if approved by the student’s Advisory Committee and the dean of the Graduate School. Students who wish to proceed toward the Ph.D. degree without obtaining a M.S. in the department must submit a petition to the Graduate School once they have met the following requirements:

1. Accumulation of a minimum of 26 graduate credits with a GPA of 3.5 or greater.
3. A minimum of 8 credits of Biochemistry and Molecular Biology 590.
4. Approval of change in program status by two-thirds of the faculty members in the department after review of the student’s academic accomplishments, research performance and professional conduct.

M.D./Ph.D.

The Department offers the M.D./Ph.D. degree. For further information consult the Department.

Courses

BIMD 500. Cellular and Molecular Foundations of Biomedical Science. 6 credits. A series of lectures and discussion groups with emphasis on interrelated themes in basic biochemistry, cell biology and molecular biology. Lectures will include current and emerging areas of research, while discussion will center on methods, techniques and expanding field of lecturers. Fall semester. Prerequisites: a) one year of organic chemistry or b) one semester of organic chemistry and one course in either biochemistry or cell biology or c) permission of course director.

BIMD 510. Basic Biomedical Statistics. 2 credits. Prerequisites: BIMD 500 or permission of course director. A series of lectures and demonstrations to provide students with the basic rationale for the use of statistics in the assessment of biomedical data and a selected set of the most common and useful statistical tests.

BIMD 513. Seminars in Biomedical Sciences. 1 credit. A series of presentations on original research conducted by UND faculty members as well as extramural leaders in the fields of academic and industrial research in the biomedical sciences. Students will participate through assigned reading and writing exercises related to the presentations.

BIMD 515. Steps to Success in Graduate School. 1 credit. A series of lectures and discussion sessions covering topics related to the development of skills and experience important for successful completion of graduate training and transition to post graduate training and employment. Students will examine a variety of issues including choosing an advisor and research topic, charting their course through graduate school, the importance of productivity, how to give a scientific presentation and write a scientific publication, applying for predoctoral grants, and planning for their careers.

BIMD 516. Responsible Conduct of Research. 1 credit. 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.

514. Current Literature. 1 credit. Second semester. Prerequisite: BIMD 500 or consent of instructor. 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. SU grading only.

521. Seminar. 1 credit. First semester. Prerequisite: BIMD 500 or consent of instructor. 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. SU grading only.

533. Advanced Topics. 1 credit. Special topics. Prerequisite: BIMD 500; alternatively, biochemistry 501 or equivalent and permission of instructor. 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.

540. Special Topics. 1 to 3 credits. Prerequisite: BIMD 500 or consent of instructor. Discussion of a topic in biochemistry and/or molecular biology of current interest to faculty and students.

590. Research. 1 to 12 credits. The assignments deal with pertinent research problems in various aspects of biochemistry and molecular biology.

594. Special Problems in Biochemistry and Molecular Biology. 1 to 6 credits. Prerequisite: Consent of instructor. The student in consultation with a faculty member of the department undertakes a laboratory research project.

595. Readings in Biochemistry and Molecular Biology. 1 to 3 credits. Prerequisite: BIMD 500 or consent of instructor. 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.

Biology

Professors: Carmichael, Crossley, Darland, Goodwin, Kelsch, Kupchella, La Duke, Meberg, Mehl, Newman (Graduate Program Director), Potvin, Pyle, Ralph, Rhen, Schlosser (Chair), Sheridan, Simmons, Swietzer, Tkach and Vaughan

Program Description

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: Ecology; Behavior; Fisheries Biology; Wildlife Biology; Genetics; Cell Biology and Neurobiology; Morphology; Physiology; Systematics and Molecular Biology. A reputation for excellence in the area of “Ecology of the Northern Great Plains” has been developed, and the Ph.D. program has been designated by the Western Interstate Commission for Higher Education (WICHE) as a Western Regional Graduate Program because of its uniqueness and strength. It is, therefore, open to residents of the 13 western states at resident tuition rates.

Facilities for Graduate Research

The Department operates two field stations for research and class use. The Forest River Biology Area consists of 160 acres and is 40 miles from the campus. It includes habitats suitable for studies in aquatic and woodland biology: spring brook, swamp, moist and dry woods, and a section of the Forest River. The Oakville Prairie Station consists of 950 acres of virgin lowland prairie and is located 12 miles from the campus.

The Biology Department and the North Dakota Game and Fish Department have a history of cooperative research involving the management of sport and commercial fisheries and wildlife.

Admission Requirements

1. An undergraduate major with at least 20 semester credits of applicable science courses.
2. Graduate Record Examination—both the General and the Subject Test in Biology (Doctoral applicants must average at least the 60th percentile).
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 and through normal application procedures, i.e., GRE scores averaging 60 percentile and a GPA no lower than 3.5 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 shall consist 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.

An examination of equivalent nature to a M.S. comprehensive examination will be given by the student’s advisory committee and, upon successful completion, the student may obtain admission to the doctoral program.

Students seeking summer or fall admission should complete their applications by February 15. 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.

**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**

**Master of Science**

The Master of Science degree program is designed to produce broadly trained biologists for job opportunities or continued graduate study.

**Thesis Option**

1. Thirty (30) credit hours including research and thesis, as well as a minimum of two credits of seminar.
2. Successful completion of a comprehensive examination administered by the student’s advisory committee.

**Non-Thesis Option**

1. Thirty-two (32) credits including a minimum of 23 credits in the major.
2. A minimum of two credits of seminar.
3. Preparation of a written independent study and oral presentation of the results to the advisor and interested faculty.
4. Written comprehensive final examination.

**Doctor of Philosophy**

1. Performance of research suitable for publication in refereed professional journals, and the writing of a dissertation based thereon.
2. Four (4) credits of seminar.
3. Scholarly tool requirement of the following options: (1) reading knowledge of two foreign languages; (2) reading knowledge of one foreign language and 5 credits of coursework in a supporting area; (3) five credits of coursework in each of two supporting areas. (Supporting areas include anatomy, biochemistry, chemistry, computer science, geography, microbiology, physiology, psychology, or statistics.)
4. A minor is not required, but each student is expected to show competence in related areas as determined by the student’s advisory committee.

Work completed on a master’s degree program may be incorporated into the doctoral program if approved by the student’s advisory committee and the Dean of the Graduate School.

**Courses**

503. Seminar. 1 credit. Discussion of selected topics in advanced biology, a different topic each semester.

504. College Biology Teaching. 3 credits. Survey of literature and trends in college biology teaching.

505. Biological Inquiry for Teachers. 3 credits. Prerequisite: Must be a licensed K-12 teacher; Biol 505L. First of general biology course sequence intended for teachers planning to quality 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.

505L. Biological Inquiry for Teachers Laboratory. 2 credits. Prerequisite: Must be a licensed K-12 teacher. 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.

506. Ecology for Teachers. 3 credits. Prerequisite: Must be a licensed K-12 teacher; Biol 506L. Second of a general biology course sequence intended for teachers planning to quality to teach high school biology, or teachers looking to enrich their content knowledge in biology for professional development. Topics will include physiologic 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.

506L. Ecology for Teachers Laboratory. 2 credits. Prerequisite: Must be a licensed K-12 teacher. 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.

507. Cellular and Molecular Biology for Teachers. 3 credits. Prerequisite: Must be a licensed K-12 teacher; Biol 507L. Third of a general biology course sequence intended for teachers planning to quality 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.

508. Natural Resource Policy. 3 credits. A course that provides a detailed review of the major federal laws and key international treaties governing natural resource management and wildlife conservation on federal, state and private lands.

520. Helminthology. 3 credits. Prerequisite: Biology 364 or equivalent. Morphology, physiology, and life histories of the worm parasites of humans and other animals.

522. Medically Important Arthropods. 2 credits. Prerequisites: Biology 363 or 364 or equivalent. The biology, distribution, and health significance of insects and arachnids having human and veterinary importance.

533. Grassland Ecology. 2 credits. Prerequisite: Biology 332 or equivalent. Phytogeography, environmental influences, and community dynamics of grassland ecosystems with emphasis on herbage production, ecosystem modeling, and ecological characteristics of major grass species.

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.

539. Animal Societies. 2 credits. Prerequisite: Biology 338 or equivalent. Social organization in animals, emphasizing division of labor, communication, reproductive behavior, and adaptations to the environment.

540. Waterfowl Biology and Management. 2 credits. Classification, biology, and management of waterfowl.

542. Comparative Endocrinology. 3 credits. A comparative study of the hormonal regulation of physiological processes and mechanisms of hormone action in vertebrates and invertebrates.

551. Biochemical Genetics. 3 credits. Prerequisite: Biology 341 and 315 or equivalent. Topics include gene structure, gene protein relationships, transcription and translation, mutation, extra-chromosomal elements, and the regulation of gene expression. There is a substantial emphasis on the genetics of higher organisms.

554. Cytogenetics. 2 credits. Prerequisites: Biology 315 and 367 or equivalent. The cytological basis of genetics with special reference to chromosomal structure, number aberrations, and their effect on inheritance and evolution.

564. Developmental Morphology of Plants. 2 credits. Prerequisite: Biology 361 or consent of instructor. Morphological development of plants with emphasis on the causal factors.
Admission Requirements

Admission to Approved Status requires:

1. Applicant must adhere to the UND Graduate School standards for admission.

2. Completion of the Graduate Management Admission Test (GMAT) with a score that equals or exceeds an overall score of 500. Those being admitted under the Combined Model must complete the GMAT with a score that equals or exceeds an overall total score of 550. In certain circumstances, applicants may substitute the GRE or LSAT for the GMAT (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 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). This command is demonstrated by having satisfactorily completed 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.

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, provided they meet one of the following indices:

1. A composite index score of at least 1010 determined by the formula: (GMAT) + [200 x (overall undergraduate gpa)]

2. A composite index score of at least 1,060 determined by the formula: (GMAT) + [200 x (last 2 years or equivalent undergraduate gpa)]

Under no circumstances will applicants with GMAT scores below 450 (550 for students under the combined 3/2 model) be recommended for admission. Students may take nine graduate credits towards the MBA degree as a non-degree student. Additional credits beyond the nine will not fulfill degree requirements. It is critically important that MBA students seek admission prior to exceeding nine credits.

Combined Admission

Individuals at UND currently completing their junior year towards their business degree, or those who received a three-year degree from a non-U.S. college/university, may make application to the MBA under combined admission. For students currently completing their undergraduate degree, combined admission allows the ability to more effectively manage their course load. For prospective students holding a non-U.S. three year degree, the combined admission permits admission to the MBA without taking a year of study as a non-degree student. The MBA program under the combined admission, however, will be a minimum of two years of study.

M.B.A. Prerequisite Curriculum

Applicants must demonstrate command of a core curriculum in business and administration through course work in economics, ac-
counting, quantitative methods, 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.

Accounting 200 and 201 .......... Elements of Accounting I & II .......... 6 credits
ISYS 317 .......... Information Systems in Enterprise .......... 3 credits
Economics 206 .......... Survey of Economics Principles:
                      Micro-Macro (MBA only) ......................... 4 credits
Economics 216 .......... Mathematics and Statistics
                      for the MBA ................................................................ 3 credits
Accounting 315 .......... Business in the Legal Environment .......... 3 credits
Finance 310 .......... Principles of Financial Management .......... 3 credits
Management 300 .......... Principles of Management ................... 3 credits
Management 301 .......... Operations Management ..................... 3 credits
Marketing 305 .......... Marketing Foundations ......................... 3 credits

The above courses are described in the departmental listings covering undergraduate programs.

Econ 206 may be satisfied by Micro and Macroeconomics
Econ 216 may be satisfied by one semester each of Statistics and Calculus

Degree Requirements

The M.B.A. degree program is interdisciplinary and 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 Departments of Accounting, Economics, Finance, Information Systems, Marketing, Management, and Political Science and Public Administration are described elsewhere in this section.

The M.B.A. 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 3.00 or better. The program includes an M.B.A. curriculum of 26 semester credits, including the Independent Study (BADM 997 — 2 credits), and sufficient cognate electives to total 32 semester hours.

The M.B.A. Curriculum includes the following required courses:

Management 501 .......... Quantitative Analysis for
                      Management Decisions .................................. 3 credits
Management 585 .......... Advanced Strategic Management .......... 3 credits
Management 515 .......... Advanced Managerial Theory ............... 3 credits
Marketing 510 .......... Strategic Market Planning ..................... 3 credits
Economics 509 .......... Macroeconomic Decision-Making .......... 3 credits
Accounting 509 .......... Accounting Information for Decision
                      and Control .................................................. 3 credits
Finance 501 .......... Managerial Finance .................................. 3 credits
ISYS 510 .......... Information Systems .................................. 3 credits

TOTAL 24 credits

2. Cognate elective courses may be chosen from those offered at the 300, 400 and 500 level in the areas of Accounting, Economics, Finance, Information Systems, Marketing, Management, Political Science & Public Administration and related fields. A cognate may be chosen from selected courses in the aviation management area.

300 and 400 level courses taken for graduate credit must have a graduate level component included to be considered part of the Program of Study.

All cognate elective courses and aviation management cognate courses must be approved by the M.B.A. Program Director prior to enrollment.

Substitutions require the prior approval of the MBA Director and the Graduate Dean.

Final Examinations. The requirement of the final examinations for the M.B.A. degree is satisfied by the successful completion of Management 585, Advanced Strategic Management.

Concentration in Accounting

In order to receive a concentration in accounting, a minimum number of courses in accounting must be taken at the undergraduate level. The courses below provide the student with the necessary minimum background to pursue graduate education in accounting. Based on the advice of the MBA Director, additional courses may be recommended, depending on the individual student’s level of preparation and background.

Accounting 200 & 201 Elements of Accounting I & II .......... 6 credits
Accounting 301 & 302 Intermediate Accounting I & II .......... 7 credits
Accounting 309 .......... Accounting Information Systems .......... 3 credits
Accounting 320 .......... Accounting for Production ................. 3 credits
Accounting 405 .......... Assurance Services ................................ 3 credits
Accounting 411 .......... Business Income Taxation ................. 3 credits

Total Minimum 25 credits

Students who already have completed courses similar to those in the MBA Curriculum may be required to choose substitutes from the graduate credit offerings listed in this catalog.
university beyond the nine semester hours of course work mentioned in #4.

6. The independent study (BADM 997) will most likely be in international business. Data or other types of information relating to the independent study may be collected during the student’s international experience.

Courses

ACCOUNTING

501. Seminar in Accounting Problems. 1 to 4 credits. Special problems in accounting and accounting research. May be repeated.

503. Accounting Theory. 3 credits. Prerequisite: satisfactory evidence of academic training or practical experience. Theory and use of accounts and accounting principles.

504. Advanced Auditing. 3 credits. Prerequisite: the same as for 503. Auditing theory and practice.

505, 506. Specialized Accounting Problems. 6 credits. Prerequisite: the same as for 503. Research, analysis, and problem solving.

507. Advanced Managerial Accounting. 3 credits. Functional use of accounting in management of the enterprise.

509. Accounting Information for Decision and Control. 3 credits. Prerequisites: Accct 200 and Accct 201, Math 146, and Econ 210. Management accounting concepts and their application in internal planning, control, and decision-making.

510. Industrial Quantitative Controls. 3 credits. Prerequisite: Accounting 306. The use of quantitative techniques in business decision making. Some of the topics include probability concepts, decision theory, inventory control, and linear programming.

575. Special Topics. 3 credits. Specific topic will vary from offering to offering at the discretion of the department. Dependent 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. Regular grading.

590. Contemporary Readings in Accounting. 2 credits. Review of outstanding monographs and other writings in the field of accounting.

591. Accounting Research. 1 to 6 credits. Individual student projects designed to develop skills in accounting research.

592. Research in Federal Tax. 1 to 4 credits. Prerequisite: Accounting 411 or equivalent. Research in Federal Income Tax with emphasis on corporations and shareholders.

309. Accounting Information Systems. 3 credits.

312. Fund Accounting. 3 credits.

401. Advanced Accounting. 3 credits.

403. Contemporary Accounting Theory. 3 credits.

405. Assurance Services. 3 credits.

406. Independent Assurance. 3 credits.

410. Federal Individual Income Tax. 3 credits.

411. Business Income Taxation. 3 credits.

BUSINESS ADMINISTRATION

502. Business Research Methods. 3 credits. Prerequisites: Completion of MBA foundation courses or consent of instructor. 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.

597. Graduate Cooperative Education. 1-3 credits. Prerequisites: Approved status, approval of MBA Director. 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. This course may be taken only once. S/U grading only.

996. Continuing Enrollment. Variable credit.

997. Independent Study. 2 credits. (See the Academic Policies section for details on 996 and the Degree Requirements section for 997.)

BUSINESS LAW

593. Research in Business Law. 1 to 4 credits. Individual projects designed to develop basic skills in legal research.

416. Advanced Business Law. 3 credits.

ECONOMICS

504. Advanced Price Theory. 3 credits. Prerequisite: Economics 308 and 416. 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.

505. Advanced Macroeconomic Theory. 3 credits. Prerequisite: Economics 309 and 416. 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.

589. Macroeconomic Decision-Making. 3 credits. Prerequisite: Economics 202 and Math 146. 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.


511. Advanced Business and Economic Forecasting. 3 credits. Prerequisite: Economics 310. Various time series and regression approaches as well as special topics are covered in conjunction with computer-based assignments. Specification, estimation, and diagnostic techniques are emphasized for both forecasting and simulation.

516. Advanced Managerial Economics. 3 credits. Prerequisites: Econ 201, Iys 117 and 317, Math 146, or permission of the instructor. 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, the internal organization of the firm. Case studies are utilized as a main method of analysis.

524. Applied Economic Analysis I. 3 credits. Prerequisites: Economics 410, 411, 416, and 505. Studies of economic impact, with emphasis on defined area employment, income, tax base, infrastructure, and business feasibility. Students will be expected to design and complete studies of professional quality using the tools of economic theory and econometrics, including input-output analysis, and gravity/entropy models.

530. Seminar in International Economics. 3 credits. Prerequisites: Economics 309 and Economics 338 or consent of instructor. Topics to be discussed include: Advanced Theory Underlying International Trade, Balance of Payments, International Monetary System. Detailed examination of disequilibria, adjustments and coordination of external and internal monetary and fiscal policies in those areas. Multinational corporations, world trade, New International Economic Order (NIEO) and trade.

534. Applied Economic Analysis II. 3 credits. Prerequisites: Economics 410, 411, 414, 416, and 504. Economic theory and econometric methods are applied to typical business problems. Examples include cost estimation, product demand, learning models, scale and size economies, quality change, wage determination and discrimination, investment expenditure, public utility demand, advertising, factor requirements, and optimization of factor mix.

550. Seminar on the Economics of Regulation. 3 credits. Prerequisites: Economics 308 or Econ 514 or Econ 504, or permission of the instructor. Journal articles in regulatory economics will be discussed in a seminar format. Key components of the course include: the foundation for utility regulation; determining the cost of capital; the importance of cost and demand factors in rate design; energy conservation; and alternatives to rate-of-return regulation.

575. Advanced Special Topics. 2 to 4 credits. Specific area varies from year to year; some years an important aspect of economic theory; other years, a significant issue in economic policy.

580. Economic Development. 3 credits. Prerequisites: Economics 504 and 505. The first part of this course focuses on growth theories, globalization, 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.

592. Research in Economics. 2 to 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.

597. Economic Research Internship. 1 to 3 credits. MSAE students are required to participate in a research internship, unless they have chosen the thesis option. Interns may be assigned to governmental agencies, businesses, community organizations, or partnered with faculty members engaged in research. On demand.

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 MSAE Program Director. F,S,SS

998. Thesis. 4 credits. The thesis is an original research project completed under the supervision of a thesis committee. F,S,SS

Courses listed below are described in the undergraduate section of this catalog, and may be taken by MBA students who did not take them as undergraduates. MBA students taking these courses are expected to perform at a higher level, both in the quality and quantity of work.

324. Public Finance. 3 credits.

331. Comparative Economic Systems. 3 credits.

338. International Economics. 3 credits.

341. Labor Economies and Labor Relations. 3 credits.

355. Government Regulation of Business. 3 credits.

400. History of Economic Thought. 3 credits.

416. Mathematics for Economists. 3 credits.

438. International Money and Finance. 3 credits.
FINANCE
501. Managerial Finance. 3 credits. Prerequisite: Math 146; Acct 200, Acct 201; Econ 210, and Fin 310. 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.

520. Investment Theory and Management. 3 credits. Prerequisites: Finance 501 or consent of instructor). 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.

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.

420. Cases in Managerial Finance. 3 credits.

420. Investment Analysis and Portfolio Management. 3 credits.

MANAGEMENT
501. Quantitative Methods for Managers. 3 credits. Prerequisite: Mgmt 301. This course introduces concepts and techniques for analyzing situations and formulating sound decisions in both complex and uncertain environments. Students will use a combination of mathematical and computer-based modeling to forecast future events, analyze waiting lines and queueing systems, simulate flows of information and materials, optimize the allocation of resources, analyze networks, and evaluate the effects of risk and uncertainty in decision making. Applications in marketing, management, operations, finance, and other areas of business will be used extensively. Additional topics may be covered at the instructor's discretion.

585. Advanced Strategic Management. 3 credits. Prerequisite: Acct 509, Mgmt 515, Mkt 510, Fin 503, or consent of instructor. Course should be taken near the end of an MBA program. An integrating course designed to develop coordinating ability and experience in the decision-making process. The essence of strategic management is to thoroughly evaluate a firm's strategy, the environment in which it operates, the resources it has available, and develop plans to ensure sustained competitive advantage. 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 need for all departments in a business to work in concert towards common goals. Cases place emphasis on the role of business enterprise in the community and to society generally.

515. Advanced Managerial Theory. 3 credits. Prerequisite: Management 300 or consent of instructor and graduate standing. 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 topics such as organizational design, climate, and organizational process are also covered as these relate to human behavior in organizations.

575. Special Topics. 3 credits. Specific topic will vary from offering to offering at the discretion of the department. Departmental permission will be required for enrollment. Prerequisites and/or corequisites may be required depending upon the special topic selected. Course may be repeated up to a total of 9 credits with permission of department.

596. Individual Research. 2 to 4 credits.

597. Readings in Management. 3 credits.

400. Organizational Theory and Analysis. 3 credits.

407. Wage and Salary Administration. 3 credits.

408. Issues in Human Resource Management. 3 credits.

409. Union-Management Relations. 3 credits.

420. Multinational Management. 3 credits.

INFORMATION SYSTEMS
510. Information Systems. 3 credits. Prerequisite: ISys 317. 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.

MARKETING
510. Strategic Market Planning. 3 credits. Prerequisites: Econ 201 and Mkt 305. Marketing from the point of view of an executive charged with the marketing function in a business enterprise. The course introduces students to strategic market planning through the development of marketing plans, use of cases, or simulation exercises.

540. Marketing Seminar. 3 credits. Prerequisite: Marketing 305. Emerging topics in the field of marketing. On demand.

575. Special Topics. 3 credits. Specific topic will vary from offering to offering at the discretion of the department. Departmental permission will be required for enrollment. Prerequisites and/or corequisites may be required depending upon the special topic selected. Course may be repeated up to a total of 9 credits with permission of department.

592. Graduate Research in Marketing. 1 to 3 credits. Prerequisites: BADM 502 and consent of instructor. Repeatable to 6.

595. Graduate Readings in Marketing. 1 to 3 credits. Repeatable to 6. Prerequisite: Consent of instructor.

Chemical Engineering
Professors: Bowman, Kolodka, Kozlak, Mann (Chair), Muggli, Seames (Graduate Program Director) and Tande
Adjunct Professors: Benson, Hurley, Olson and Swanson

Program Description
The Department of Chemical Engineering offers graduate programs leading to the degrees of Master of Science, with thesis and non-thesis options, and the Master of Engineering. The department also participates in the multi-disciplinary Engineering Ph.D. program and the multi-disciplinary Environmental Engineering master’s program. The M.S. or M.Engr. degree can be completed in 15-24 months of full-time study by a student holding an accredited baccalaureate degree in chemical engineering. It has been common for students holding baccalaureate degrees with majors in chemistry, math or other science degree to apply, enroll, and successfully complete requirements for the M.S. degree with a major in chemical engineering. The Department of Chemical Engineering also offers a combined Bachelor of Science in Chemical Engineering (BSChE)/Master of Science (with a major in chemical engineering) and BSChE/Master of Engineering (MEngr) degrees. The intention of the combined BSChE/M.S. and the combined BSChE/MEngr programs is to allow qualified students to complete requirements for both degrees in one year beyond that which is required to receive the baccalaureate degree.

Research interests in the department include energy processes and technology, biochemical processes, trace metal removal and control processes, environmental catalysis, process modeling, aerosol modeling, and polymer synthesis and characterization. Research projects are often performed through the Sustainable Energy Research Initiative (SUNRISE) or in collaboration with the Energy and Environmental Research Center (EERC), which has extensive analytical, laboratory, and pilot plant facilities.

Admission Requirements
Master of Science
1. B.S. degree in chemical engineering from an ABET accredited program.* See “Combined Degree Program” under the School of Engineering and Mines 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 chem. 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 other than ABET accredited programs.

Master of Engineering
1. B.S. degree in Chemical Engineering from an ABET accredited program.*

2. Overall GPA of at least 2.50 or a GPA of at least 3.00 for the last two years. (An overall GPA of at least 3.0 for the combined BSChE/MEngr degree is required.)

*Students applying for the combined BSChE/MS or BSChE/MEngr degrees can do this the semester before the BSChE degree would be awarded.
Degree Requirements**

Master of Science

There are no specific departmental degree requirements beyond those required by the Graduate School for the Master of Science degree.

Master of Engineering

1. Thirty credits (30) with at least 15 credits of chemical engineering at the 500-level.
2. Fifteen (15) credits in engineering design, including either Chemical Engineering 511 or 512, Engineering 595 (3 credits), and nine 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.

**Specified requirements of the BSChE degree and all requirements for the respective master’s degree must be met.

Courses

501. Advanced Transport Phenomena. 3 credits. Prerequisite: Che 301 and Math 266. 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.

503. Fuels Technology. 3 credits. 3 to 6 hours. Processing and utilization of low rank fuels.

504. Air Pollution Control. 3 credits. Background equivalent to Chem 122, Math 265, and Physics 252 is expected. 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.

507. Advanced Unit Operations. 3 to 6 credits. Background equivalent to Che 405 is expected. One or more of the following: fluid flow, heat flow, evaporation, humidification and dehumidification, drying, gas absorption, distillation, and extraction.

508. Advanced Unit Operations. 3 to 6 credits. Continuation of the first semester’s work in advanced unit operations.

509. Advanced Chemical Engineering Thermodynamics. 3 credits. Background equivalent to CHE 304 is expected. Chemical Engineering processes from the standpoint of quantitative thermodynamics. Special emphasis on thermodynamics of chemical reactions.

510. Advanced Chemical Process Control. 3 credits. Prerequisites: Math 266, CHE 408 or equivalents. 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 discrete-time dynamic response of chemical process systems.

511. Advanced Chemical Engineering Kinetics. 3 credits. Background equivalent to CHE 421 is expected. Theory and practice of industrial chemical reactor design. Advanced topics in kinetics of industrial chemical reactors.

512. Advanced Separations. 3 credits. Prerequisites: Background equivalent to CHE 405, 421, and Math 265 is expected. Analysis of rate-based chemical engineering separations such as adsorption membrane separations, chromatography, and crystallization.

515. Design of Engineering Experiments. 3 credits. Prerequisite: Math 265. Design and analysis of experimental data including block and factorial arrangements, significance of data, and mathematical modeling.

553. Metallic Corrosion and Polymer Degradation. 3 credits. Reviews the forms of metal corrosion and of polymer degradation; discussion of control and mitigation techniques.

562. Seminar in Chemical Engineering. 1 credit. Conferences and reports on current developments in Chemical Engineering. SU grading only.

591. Research. Credit hours to be arranged. Analysis, planning, and detailed study of definite problems; individual laboratory work on some selected problems to develop the power of independent investigation. SU grading only.

593A. Special Topics. 1 to 3 credits. Topics of current interest to be considered each semester. Regular grading.

593B. Special Topics. 1 to 3 credits. Topics of current interest to be considered each semester. SU grading.

595. Design Project. 3 to 6 credits. Prerequisite: Restricted to the Master of Engineering students and subject to approval by the student’s Advisor. A three to six credit course of engineering design experience involving individual effort and formal written report. SU grading only.

997. Independent Study. 2 credits.

998. Thesis. 1 to 9 credits. Development and documentation of scholarly activity demonstrating proficiency in Chemical Engineering at the master’s level. F,S,SS. SU grading only.

Chemistry

Professors: H. Abrahamson (Graduate Program Director), J. Abrahamson, Banerjee, Delbridge, Hoffmann (Chair), Kozliak, Kubatova, Novikov, Pierce, Smoliatka, Stahl, Thomasson and Zhao

Program Description

The Department of Chemistry offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy with majors in inorganic chemistry, organic chemistry, physical chemistry, and analytical chemistry. The department offers a combined B.S./M.S. program (using the non-thesis M.S. option) for students who meet the admission criteria listed below.


All students beginning graduate work in chemistry must take orientation-diagnostic examinations over the fields of inorganic, organic, physical, and analytical chemistry during the week preceding their first registration. These examinations are used to determine the course level at which students begin their work.

Admission Requirements

Master of Science (Combined B.S./M.S Program) (Non-thesis option)

1. Completed the junior year (95 semester credits) in a Chemistry baccalaureate program with cumulative and Chemistry GPAs of 3.0 or better.*

2. One year general chemistry, one year organic chemistry, one semester analytical chemistry, and one semester physical chemistry.

3. At least one letter of recommendation from a chemistry faculty member.

* Students will be admitted to Graduate School upon completion of 125 credits.

Doctor of Philosophy

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.

Degree Requirements

Master of Science

(Non-thesis option*)

Degree Requirements (32 credits total):

1. 9 credits of graduate chemistry from area of specialization. May include one 400-level course from the list below.*
2. 1 credit of Chem 509 (Graduate Seminar) and 1 credit of Chem 508 (Departmental Lecture).
3. 9 elective credits (may come from departments other than chemistry). +
4. 1 credit of Chem 509 or 488 (taken for graduate credit) and one credit of Chem 508 each semester, except when enrolled in Chem 509.
5. Either:
   (a) Co-op track - 6 credits Chem 537 (Graduate Cooperative Education)
   2 credits Chem 509 (Research)
   or
   (b) Research track - 8 credits Chem 599 (Research)
6. 2 credits of Chem 997 (Independent Study Report). Preparation of a written independent study and oral presentation of results to the adviser 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 normed ACS exam in their area of specialization at a proficient level.

The following undergraduate courses are eligible for inclusion on graduate programs of study as long as they are NOT required for the B.S. degree. Additional assignments and higher standards of accomplishment are required of students taking these courses for graduate credit. See the Undergraduate Section for course descriptions.

- Chem 454. Inorganic Chemistry II
- Chem 455. Spectroscopy and Structure
- Chem 461. Instrumental Analysis (not Chem 461L)
- Chem 463. Advanced Synthesis Laboratory
- Chem 464. Physical Chemistry I
- Chem 465. Physical Chemistry II
+ Requires prior approval of student’s committee.

**Master of Science**

(Thesis option)
1. 1 (total) credit of Chem 509 (Graduate Seminar) and, for each semester in the program, 1 credit of Chem 508 (Departmental Lecture), except for those semesters when enrolled in Chem 509.
2. Six (6) credit hours from major sequence (Analytical: 541, 542, 543; Inorganic: 510, and one of: 511, 512; Organic: 520, 521, 522; Physical: 530, 531, 532).
3. Six (6) credit hours of 500-level chemistry courses from two divisions other than the major.
4. Three (3) credit hours of additional elective coursework.
5. Chemistry 599 (Research).

**Doctor of Philosophy Degree**

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. Two (total) credits of Chem 509 (Graduate Seminar) and, for each semester in the program, 1 credit of Chem 508 (Departmental Lecture), except for those semesters when enrolled in Chem 509.
2. Nine (9) credit hours of 500-level courses from major sequence (Analytical: 541, 542, 543; Inorganic: 510, 511, 512; Organic: 520, 521, 522; Physical: 530, 531, 532).
3. Twelve (12) credit hours of elective courses (at least nine must be in 500-level Chemistry courses; six of these nine must be taken in two divisions other than the major).
4. Chemistry 599 (Research).

**Courses**

508. Departmental Lecture. 1 credit. Introduction to current research in chemistry and professional chemistry seminar preparation. F,S

509. Graduate Seminar. 1 credit. Student presentation of a seminar based on current peer-reviewed literature. F,S

510. Intermediate Inorganic Chemistry. 3 credits. Three hours lecture. Prerequisite: Chem 454 or equivalent. 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.

511. Advanced Inorganic Chemistry. 3 credits. Three hours lecture. Prerequisite: Chem 510. Structure of coordination compounds, mechanisms of inorganic reactions, biochemical applications of inorganic chemistry.

512. Organometallic Chemistry. 3 credits. Prerequisite: Chem 454. Preparation, bonding and reactivity of organometallic compounds, both main group and transition metal.

519. Special Topics in Inorganic Chemistry. 1 to 3 credits. Prerequisite: Chem 510. Topic of current interest to be considered each semester; may be repeated for credit if topic is different.


529. Special Topics in Organic Chemistry. 1 to 3 credits. Prerequisite: Chem 520 or 521. Topic of current interest. May be repeated for credit if topic is different.

530. Chemical Thermodynamics. 3 credits. Three hours lecture. Prerequisite: Chem 460 or equivalent. Application of classical and statistical thermodynamics to chemical equilibrium, phase equilibrium and the physical properties of solutions.

531. Chemical Dynamics. 3 credits. Three hours lecture. Prerequisite: Chem 465 or equivalent or consent of instructor. Study of the kinetics of complex, coupled chemical reactions in gas and solution phases; dynamics of gas phase reactions.

532. Quantum Mechanics in Chemistry. 3 credits. Three hours lecture. Prerequisite: Chem 464 or equivalent. Application of the time-dependent Schrodinger equation to rotational, vibrational and magnetic spectroscopy; selection rules. Relation of molecular structural parameters and spectroscopic measurements: principles of group theory.

534. Quantum and Computational Chemistry. 3 credits. Three hours lecture. Prerequisite: Chem 532. 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.

537. Graduate Cooperative Education. 1-9 credits. Prerequisites: M.S. students must have minimum of 26 credits. Permission of Department Chair. Ph.D. students must have a minimum of 52 credits. Practical experience of applying advanced concepts in chemistry. Experience will vary from student to student and must be coordinated with co-op host.

539. Special Topics in Physical Chemistry. 1 to 3 credits. Prerequisites: consent of department. Topic of current interest. May be repeated for credit if topic is different.

541. Analytical Spectroscopy. 3 credits. Three hours lecture. Prerequisite: Chem 461 or equivalent. Fundamentals of analytical spectroscopy including principles of emission spectroscopy, flame photometry, atomic absorption, infrared and Raman spectroscopy, ultraviolet/visible spectroscopy, and fluorescence.

542. Electrochemical Methods. 3 credits. Prerequisite: Chem 461 or equivalent. Three hours lecture. 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.

543. Chromatography. 3 credits. Prerequisite: Chem 461 or equivalent. Three hours lecture. Fundamentals of modern chromatographic techniques including principles of band broadening, gas chromatography, liquid chromatography, and representative sampling problems.
Civil Engineering

Professors: Gullicks, Jerath, Lim, Mamaghani, Moretti (Chair and Graduate Program Director) and Suleiman

Program Description

The Department of Civil Engineering offers graduate programs leading to the Master of Engineering degree and the Master of Science degree. The Master of Engineering degree permits specialization in the following options: Soils-Structures, Environmental-Water Resources, 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 department offers a combined Bachelor of Science in Civil Engineering/Master of Engineering degree program. 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 one year beyond the time required to complete the baccalaureate degree. See Combined Degree Program under the School of Engineering and Mines section for additional details.

The Department of Civil Engineering also participates in an interdisciplinary Ph.D. Engineering Program. For information please contact the Civil Engineering Department.

Admission Requirements for Master of Science program in Civil Engineering

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.

Degree Requirements for Master of Engineering program

1. Total of thirty (30) credit hours.

2. a) Soils-Structures option requires CIEN 501, CIEN 502 and ME 529.
b) Environmental option requires CIEN 531, CIEN 532, and CIEN 533.
c) Water Resources option requires CIEN 523, CIEN 524, CIEN 525 or Geol 417.
d) General Civil option requires CIEN 501, CIEN 523 and CIEN 531.
e) Each option requires six (6) credit hours of Engr 595.

3. The remaining fifteen (15) credit hours of electives are chosen from 300, 400 or 500 level engineering, physical sciences, life sciences, computer science, and mathematics.

Degree Requirements for Master of Science Program

There are no specific departmental degree requirements beyond those required by the Graduate School for the M.S. degree.

Courses

501. Mechanics of Materials II 3 credits. Prerequisite: Engr 303. 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.


523. Applied Hydraulics 3 credits repeatable to 9 (when topics vary). Prerequisite: CIEN 423. Study of advanced topics in hydraulics. Computer applications. Content will vary.

524. Open Channel Hydraulics 3 credits. Prerequisite: CIEN 306. Study of advanced topics in open channel hydraulics. Computer applications.

525. Surface Hydrology 3 credits. Prerequisite: CIEN 421. Extreme rainfalls and flood frequency analysis, regionalization; runoff generations, routings, and basin modeling; urban stormwater design; GIS and remote sensing applications in hydrology; recent techniques and development in surface hydrology.

531. Environmental Engineering III 3 credits. Prerequisite: CIEN 431. Unit Operation and process design for water and wastewater treatment; physical, chemical, and biological systems; plant design project, computer-assigned design analysis.
Clinical Laboratory Science

Professors: Coleman, Paur (Graduate Program Director), Peterson and Schill
http://medicine.nodak.edu/cls

Program Description

The Department of Pathology Clinical Laboratory Science Program offers a graduate program leading to the Master of Science Degree in Clinical Laboratory Science (CLS), non-thesis option. The course of study enhances the student’s knowledge and skills in several major categorical areas of clinical laboratory science. The curriculum is designed to prepare students for careers as administrative laboratory directors, clinical laboratory consultants, technical supervisors, or laboratory educators. Students are required to attend three one-week laboratory courses and a one-week capstone course.

The program is offered both on campus and through distance learning. The primary method of distance learning course delivery is Web-based. Students participating in online coursework are required to have Internet access. Specific computer requirements are available from the CLS program. A limited number of teaching and research assistantships are available for students wishing to study on campus.

Admission Requirements

1. General requirements for admission to the UND Graduate School.
2. B.A. or B.S. degree and successful achievement in the CLS (NCA), in the MT (ASCP), or equivalent certification examinations. (Include proof of certification with Graduate School application.)
3. Prior experience in a medical laboratory is recommended.

Degree Requirements

1. A minimum of 32 semester credits.
2. Major area is 28 credits in the clinical laboratory sciences.
3. A cognate area of study or minor (minimum of 9 credits) is optional.

Required Core Courses:

CLS 501 .... Quality Assurance in the Clinical Laboratory ........... 2 cr
CLS 502 .... Erythrocytes in Health and Disease ......................... 2 cr
CLS 503 .... Leukocytes in Health and Disease .......................... 2 cr
CLS 504 .... Medical Microbiology for Laboratory Professionals .... 2 cr
CLS 505 .... Financial Management of the Clinical Laboratory ...... 2 cr
CLS 506 .... Clinical Chemistry ............................................. 2 cr
CLS 507 .... Clinical Immunohematology for Lab Professionals ...... 2 cr
CLS 515 .... Capstone Course in Clinical Laboratory Science ...... 2 cr
CLS 518 .... Molecular Diagnostics ......................................... 2 cr
CLS 519 .... Immunohematology Lab* ................................... 1 cr
CLS 520 .... Medical Microbiology Laboratory* ....................... 1 cr

Three of the following five laboratory courses:

CLS 510 .... Erythrocytes in Health & Disease Laboratory* .......... 1 cr
CLS 511 .... Leukocytes in Health and Disease Lab* ................. 1 cr
CLS 512 .... Immunohematology Lab* ................................ 1 cr
CLS 519 .... Molecular Diagnostics Laboratory* ..................... 1 cr
CLS 520 .... Medical Microbiology Laboratory* ....................... 1 cr
Total 28 cr

*One-week courses on campus, not available by Distance Learning
** Not available by Distance Learning

5. Electives available:

CLS 508 .... Leadership & Conflict Resolution in Health Science ... 2 cr
CLS 509 .... Education Methodologies in Laboratory Science ...... 2 cr
CLS 514 .... Computer Applications in Clinical Lab Science ........ 2 cr
CLS 517 .... Health Care Admin. for the Clinical Lab Professional . 2 cr

Clinical Laboratory Science Management Certificate

Certificate Description

The Certificate in Clinical Laboratory Science (CLS) Management provides advanced skills to practicing laboratory professionals in health administration, leadership, management, quality assurance and health informatics. The program is offered by distance learning. The method of course delivery is web-based. Students are required to have access to the Internet. Specific computer requirements are available from the CLS graduate program director.

Admission Requirements:

1. B.A. or B.S. degree in a science discipline
2. Minimum 2.5 GPA in undergraduate coursework
3. Work experience and/or a desire to work in the CLS field

Course Requirements:

CLS 501 ......... Quality Assurance in the Clinical Laboratory ...... 2 cr
CLS 505 ......... Financial Management of the Clinical Laboratory ... 2 cr
CLS 508 ......... Leadership and Conflict Resolution in the Health Sciences ............................................. 2 cr
CLS 514 ......... Computer Applications in Clinical Laboratory Science ................................................. 2 cr
CLS 517 ......... Health Care Administration for the Lab Professional ................................................. 2 cr

The courses taken in a previously completed CLS Management Certificate Program may be applied to the Master of Science in Clinical Laboratory Science degree.

Courses

501. Quality Assurance in the Clinical Laboratory. 2 credits. The course will consist of lectures, readings and case studies of quality assurance for the clinical laboratory.

502. Erythrocytes in Health and Disease. 2 credits. This course is the study of the erythrocyte. It includes discussions of the normal red cells with emphasis on molecular
structure, molecular function, production and regulation. The course continues with studies of the molecular basis of the diseases of the erythrocyte. The role of the laboratory in the diagnosis of these conditions is stressed and current research tools are included.

503. Leukocytes in Health and Disease. 2 credits. This course presents the normal and abnormal structure and function of each of the peripheral blood leukocytes. Emphasis is on the molecular level, light and electron microscopic evaluation and the role of the laboratory in diagnosis of each condition.

504. Medical Microbiology for Laboratory Professionals. 2 credits. This course provides an overview of specific molecular biology application in the laboratory and a discussion of cell biology, DNA chemistry, genetics, nucleic acid extraction and modification, blotting, polymerase chain reaction, and probes in relation to diagnostic investigations.

505. Financial Management of the Clinical Laboratory. 2 credits. This course presents an overview of financial management of clinical laboratories. Students learn several basic financial operation concepts, how to evaluate productivity and how to manage salaries, wages and supply inventories for maximum cost containment. Students learn how to plan for capital expenditures, set laboratory fee rates and plan and implement a budget.

506. Clinical Chemistry. 2 credits. This course addresses the complex and difficult problems that have arisen as a byproduct of the effort to make effective use of the resources of analytical chemistry in support of the practice of medicine.

507. Immunohematology. 2 credits. A detailed study of the blood groups of man and laboratory aspects of blood banking with special reference to theoretical and clinical applications.

508. Leadership and Conflict Resolution in the Health Sciences. 2 credits. The course will provide basic and advanced training in becoming an effective leader in health service professions. Students will learn emotional intelligence skills that support leadership, how to mediate conflict through a transformative process, and problem solving facilitation techniques. In addition, students will learn how to apply their new skills for more effective living.

509. Educational Methodologies in Laboratory Science. 2 credits. This course will include information concerning the creation of instructional and evaluative material for teaching clinical laboratory science. Classroom management techniques and the peer review process for instructors will also be included.

510. Erythrocytes in Health and Disease Laboratory. 1 credit. Laboratory evaluation of disorders of erythrocytes are presented using a case study approach. Blood and bone marrow smears are provided for morphologic study. Selected special stains and procedures are performed and discussed.

511. Leukocytes in Health and Disease Laboratory. 1 credit. This course is the study of the leukocyte. It includes discussions of the normal white cells with emphasis on molecular structure, molecular function, production and regulation. The course continues with studies of the molecular basis of the disease of the leukocyte. The role of the laboratory in the diagnosis of these conditions is stressed and current research tools are included.

512. Immunohematology Laboratory. 1 credit. This lecture/laboratory course is intended for beginners or experienced medical technologists desiring a refresher course in immunohematology. The curriculum includes resolving ABO discrepancies, utilizing enhancement techniques for antibody identification, solving problems in compatibility testing, determining neonatal and obstetrical transfusion practices, and identifying new trends in blood banking. It is designed as a one week course with 40 contact hours including 10 hours of lecture and 30 hours of laboratory.

513. Advanced Clinical Immunology for Laboratory Professionals. 2 credits. Prerequisites: Consent of Instructor. Broad array of topics which will stretch from introductory level immunology to the current research and applications of that research in the modern clinical laboratory.

514. Computer Applications in Clinical Laboratory Science. 2 credits. This course is designed to provide students with knowledge of computer usage in Health Sciences. It will include hardware configuration, software applications in health care and on-line searching of periodicals. Instruction will be primarily on-line and require specific computer requirements.

515. Capstone Course in Clinical Laboratory Science. 2 credits. Prerequisites: Completion of at least 20 credits in the Clinical Laboratory Science Master of Science Program. The Capstone Course in Clinical Laboratory Science (CLS) provides the student with a number of tools that they can use in their leadership roles in the CLS profession. The student will learn basic facilitation skills for leading meetings and solving problems in the work place. The student will develop their own professional Web page and learn how to create Web pages for their business or place of employment. They will learn about important computer applications such as Visual Basic, Excel and Power Point. The student will learn about informatics in the health sciences including applications of Internet use, Streaming Technology and Blackboard Teaching software.

516. Special Topics. 1 to 4 credits. Topical courses in laboratory medicine organized on a semester by semester basis.

517. Health Administration for the Clinical Laboratory. 2 credits. Overview of the organization and financing of health care services including an examination of the philosophical, political, and economic foundations underlying the U.S. health care system. Students also will be introduced to a myriad of health care administration resources and case studies, including decision tools for adopting new technology and quality improvement strategies.

518. Molecular Diagnostics. 2 credits. An overview of specific molecular biology application in the laboratory and a discussion of cell biology, DNA chemistry, genetics, nucleic acid extraction and modification, blotting, polymerase chain reaction, and probes in relation to diagnostic investigations.

519. Molecular Diagnostics Laboratory. 1 credit. Focused application of molecular techniques including operation of equipment, DNA extraction and measurement, blotting, polymerase chain reaction, and utilization of probes.

520. Medical Microbiology Laboratory. 1 credit. This course includes the structural, biochemical and immunological identification of human pathogens and the elimination or confirmation of organisms utilized in biological terrorism.

521. Seminar. 1 credit.

591. Directed Study in Laboratory Medicine. 1 credit. Prerequisite: Consent of instructor. Designed to meet the needs of individual students in laboratory medicine. Primarily for graduate students.

997. Independent Study. 2 credits. The independent study is designed to require the student independently to investigate a topic related to the major field of study.

Communication

Professors: Dumova, Fiordo, Holden, Horosewski, Householder (Acting Graduate Program Director), Kalbfleisch, Rakow, Rendahl and Shafer

Program Description

The School of Communication offers graduate programs leading to the Master of Arts and the Doctor of Philosophy degrees. The Masters program in Communication strikes a purposeful balance between specialization and integration among the various approaches to the study of human communication. The Ph.D. program in Communication and Public Discourse provides the opportunity for specialized study in various aspects of communication. Both the Masters and Ph.D. programs provide a flexible array of advanced coursework and intensive research. For Ph.D. students, the program culminates in the doctoral dissertation. Both the Masters and Ph.D. programs offer the opportunity for students to develop a broad range of professional and scholarly competencies. The Masters program expands the professional options for graduates as well as prepares them for more advanced study. The Ph.D. program prepares graduates for positions in the academy, industry, and government. The student’s plan of study is prepared and directed in cooperation with the student’s adviser and faculty committee.

Admission Requirements

Master of Arts in Communication:

1. Graduate Record Examination General Test.
2. Completion of the equivalent of 20 undergraduate credits in speech communication and/or mass communication, or related field, including at least 12 upper division credits.
3. Minimum 3.0 undergraduate Grade Point Average.

Doctor of Philosophy in Communication and Public Discourse:

1. Statement of interest, including personal goals and the relevance of the Ph.D. in Communication and Public Discourse to those goals.
2. Original academic paper, 10-15 pages in length, reflecting the student’s ability to articulate and synthesize ideas.
3. Three letters of recommendation from sources familiar with the applicant’s potential as a doctoral student in Communication.
4. Graduate Record Examination General Test (500 Verbal, 500 Quantitative)
5. 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.

6. Students whose native language is not English must submit results of the TOEFL, with a minimum score of 600 to be admitted.

**Degree Requirements**

**Master of Arts**

The Masters program in Communication strikes a purposeful and creative balance between the study and practice of human communication. This program will provide a rigorous learning environment, foster excellence in teaching, research and application, consistent with the University’s liberal arts tradition. The intent of the M.A. program is to graduate students with professional and scholarly competencies enabling them to be leaders in assessing and improving public communication and/or pursuing an advanced degree.

1. **Required Courses:**
   - COMM 500 (Graduate Studies in Communication)
   - COMM 501 (Theories of Communication)
   - COMM 502 (Research Methods in Communication)

2. A minimum of 30 credits in communication for the thesis option or 32 credits for the non-thesis option if a minor or cognate is not chosen.

3. If a minor or cognate is approved by the student’s advisory committee, 30 credits are necessary for the thesis option or 32 credits for the non-thesis option. A minor or cognate option will include a major with a minimum of 20 credits in communication and a minimum of 9 credits in a minor or cognate.

4. Written and oral final examinations are administered to Masters candidates. Thesis option Masters candidates will defend their theses in the final oral examination. Non-thesis option Masters candidates will be expected to defend orally independent study reports and two term papers or projects completed in any course on their program of study. Both thesis and non-thesis candidates are administered written comprehensive examinations after the completion of 18 hours of graduate credit. The Director of Graduate Studies appoints three-person examining committees from the Graduate Faculty, normally drawn from the School of Communication, and chaired by the student’s adviser to conduct the final oral examination for non-thesis students.

**Doctor of Philosophy**

The Ph.D. program in communication and public discourse provides the opportunity to explore the range of ways human symbolic activity affects the public sphere. This program will provide a rigorous learning environment, foster excellence in teaching, research and application, consistent with the University’s liberal arts tradition. 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 communication as well as public intellectuals stimulating discussion of significant communication issues.

1. **Masters degree in communication or related discipline ------------------------------------------ 30 cr**

2. **Core Requirements ------------------------------------------ 9 cr**
   - a. COMM 500 (Graduate Studies in Communication)
   - b. COMM 501 (Theories of Communication)
   - c. COMM 502 (Research Methods in Communication)

3. **Theory Requirements ------------------------------------------ 9 cr**
   - a. COMM 508 (Rhetorical and Communication Theory)
   - b. COMM 509 (Media and Mass Communication Theory)
   - c. Theory Course, selected from a menu of options

4. **Scholarly Tools Requirements ------------------------------------------ 9 cr**
   - a. COMM 510 (Advanced Research Methods in Communication) or COMM 520 (Criticism and Communication, offered alternatively as media criticism or rhetorical analysis)
   - b. Interdisciplinary Quantitative Tools, including one course selected from a menu of options
   - c. Interdisciplinary Qualitative Tools, including one course selected from a menu of options

5. **Major Area Courses, including three courses, with up to one course outside Communication ------------------------------------------ 9 cr**

6. **Elective Courses, including three courses, with up to one course outside communication ------------------------------------------ 9 cr**

7. **Comprehensive Examination, taken over the student’s first 36 credit hours of coursework as a Ph.D. student.**

8. **Dissertation ------------------------------------------ 15 cr**

**TOTAL 90 cr**

**Courses**

500. Graduate Studies in Communication. 1 credit. An overview of the study of communication emphasizing the differences between graduate and undergraduate studies. To develop a common core of knowledge for beginning graduate students, the course introduces students to the history of the communication field, current issues in communication studies and the future of communication.

501. Theories of Communication. 3 credits. Theory and model construction in communication with special attention to selected theories of speech communication and mass communication.

502. Research Methods in Communication. 3 credits. Study of the methodologies of historical, descriptive, survey and experimental research in communication.

504. Semiotics and Visual Communication. 3 credits. Application of visual communication theories to the analysis, interpretation, and critical assessment of media images.

507. Communication, Technology, and Media. 3 credits. An examination of the role of media technologies in shaping communication processes and of the way societies respond to technological determinism, technology transfer, access, and cost.

508. Rhetorical and Communication Theory. 3 credits. Prerequisite: Admission to Ph.D. program or consent of instructor. Surveys the principal rhetorical and communication theories associated with the communication subdisciplines of rhetoric and interpersonal communication with special emphasis on definitional and modeling issues. S/G.

509. Media and Mass Communication Theory. 3 credits. Prerequisite: Admission to Ph.D. program or consent of instructor. An examination of contemporary theories in mass communication and media studies, beginning with the mass society paradigm and ending with postmodern media studies. S/G.

510. Research Methods in Communication. 3 credits. Prerequisite: Admission to Ph.D. program or consent of instructor. Discussion of principal theories and models in the Communication discipline, with a focus on current debates and contemporary research methods. S/G.

512. Law and Ethics in Communication. 3 credits. Application of principles of law and ethics to diverse communication and mediated contexts. Covers issues such as right, wrong, good, and evil as well as copyright, confidentiality, privacy, and trial level remedies.

520. Criticism and Communication. 3 credits. A study of various methods of criticism applied to several types of communication including: public communication, film, electronic media, and print media.

521. Perspectives on Media Writing. 3 credits. An analysis of historical and technological developments in contemporary media writing styles and content and a critical analysis of the cultural content of media writing with regard to serving diverse audiences with targeted messages. Examines the intended and real effects of persuasive forms of writing on intended audiences, including speech writing and writing for print and broadcast. Students write in a variety of media styles to improve their own media writing skills.
535. 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.

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.

540. Seminar: Organizational Communication. 3 credits. Study of theories and practice of communication in group, intergroup and organizational settings with attention to methods of research and analysis.

545. Advocacy and Communication. 3 credits. Focuses on various communication strategies designed to influence audiences across contexts (e.g., advertising, journalism, public relations, social movements, grass root activities). Theories of public relations, rhetoric, mass communication, and persuasion are applied to specific cases of mediated and face-to-face advocacy.

550. International and Global Communication. 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.

555. Film/Video as Communication. 3 credits. A view of film from analytical, promotional, and critical perspectives. Cinema and cinematography is addressed in historical, creative, semiotic, rhetorical, and technical contexts. Cinema, directors, genres, and problems from diverse nations are examined. Students write commentaries and promotions for oral and print media sources.

570. Seminar in Communication. 3 credits, repeatable for credit up to 15 with change in topic. 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).

591. Individual Readings and Research. 3 credit limit per semester. Directed readings and research in speech communication and mass communication topics and issues. May be repeated to a total of 12 credits.


998. Thesis. 3 credits.

999. Dissertation. 15 credits.

310. Communication and Diversity. 3 credits.

401. Organizational Communication. 3 credits.

402. International/Intercultural Communication. 3 credits.

403. Community Relations. 3 credits.

404. Advertising and Society. 3 credits.

405. Social Implications of the Information Society. 3 credits.

406. Media Consequences and Effects. 3 credits.

407. Communication, Technology and the Future. 3 credits.

412. Communication Law. 3 credits.

428. History of American Journalism. 3 credits.

461. Political Communication. 3 credits.

Communication Sciences and Disorders

Professors: Fire, Madden (Chair and Graduate Director), Pawlowska, Rami, Seddoh and Swisher

Department Description

The Department of Communication Sciences and Disorders offers graduate programs leading to the Master of Science degree in Speech-Language Pathology, 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. A master’s 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.

Master of Science in Speech-Language Pathology

Program Description

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.

Admission Requirements

1. Graduate Record Examination—General Test.

2. Overall undergraduate GPA of at least 2.85 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,
   d. Quality of speaking, writing, and interpersonal skills.

6. Admissions applications 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 February 15.

Degree Requirements

1. The typical program of study includes the following courses: 525, 531, 532, 533, 536, 538, 542, 552, 553, 562, 572, 583, and 584.

2. CTL 515 Statistics I or an approved equivalent is required.

3. Thesis students will register for 998 (Thesis) and non-thesis students will register for 584 (10 or more weeks of external practicum) and 997 (Independent Study).

4. Students wishing to qualify for employment in a school setting must complete requirements for a teaching credential as a graduate student. This will include CSD 400, Methods and Materials for Speech Clinicians, and CSD 585, Practicum in the School Setting. Students must also take the Praxis I Teacher Certification Examination.

5. Graduate students already having a teaching credential with some other major must take CSD 400 and practicum in a school before being recommended for employment in a school.

Doctor of Philosophy

Communication Sciences and Disorders

Program Description

This program of study 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.

Admission Requirements

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 will include:
   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,
   d. Quality of speaking, writing and interpersonal skills.
5. Admissions applications should include documentation of the applicant’s qualifications relative to the criteria above.

Degree Requirements
1. Student 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 531, 532, 533, 536, 538, 542, 552, and 562.
2. Scholarly Tools for the Ph.D. — 12 credits required from the following: Psych 541, Psych 543, EFR 518, and CSD 592.
3. Seminar Courses within the department of Communication Sciences and Disorders — 12 credits required.
4. Cognate — 9 credits providing broad support.
5. Special Problems in Communication Disorders — CSD 597; 9 credits.
6. Research Projects — CSD 595; 8 credits. Students enroll in this course every semester. Research activity will begin in year one and continue through completion of the dissertation.
7. Dissertation — CSD 999; 10 credits. The Doctor of Philosophy degree in Speech and Hearing Science 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.

Courses
051. Seminar in Speech-Language Pathology. 1 to 3 credits. Prerequisite: Consent of instructor. May be repeated as topics change.
051.02 A study of the application of current and emerging data in the area of clinical assessment and management of speech disorders in children and adults with communication impairments.
051.03 A study of the application of current and emerging data in the area of clinical assessment and management of language disorders in children and adults with communication impairments.
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. Cullinates in a research proposal.
531. Clinical Audiology I. 3 credits. Prerequisites: CSD 431 or consent of instructor. Advanced audiological concepts and techniques including speech audiometry, masking, bone conduction, advanced pure tone testing, pediatric hearing evaluation, and the psychoacoustical bases of audiometric assessment.
532. Neurogenic Communication Disorders I. 4 credits. Prerequisites: CSD 422 and 231. 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.
533. Investigations in Child Language. 3 credits. Prerequisites: CSD 343. 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.
536. Stuttering Intervention. 3 credits. A study of the theoretical bases for and the clinical management of stuttering in children and adults.
537. Advanced Clinical Management. 2 credits. Prerequisite: completion of undergraduate major sequence in CSD or consent of instructor. Integrated study of the process involved in total clinical case management including the development of communication and observation competence, clinical literacy, creative problem solving, decision making, supervisory and consultation skills.
553. Swallowing Disorders. 2 credits. Prerequisites: CSD 422, 542, or equivalents. The study of normal and abnormal swallowing, and the purposes and guidelines for assessment of swallowing disorders.
562. Augmentative/Alternative Communication. 2 credits. Prerequisites: CSD 422 and CSD 542. A study of the evaluation and application of manual and electronic communication aids for the severely handicapped.
572. Neurogenic Communication Disorders IV. 3 credits. Prerequisites: CSD 422 and CSD 532. A study of cognitive and communication deficits that accompany right hemisphere damage, as well as traumatic brain injury, their diagnosis and management.
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.
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.
584. Advanced Clinical Practicum. 1 to 16 credits. Prerequisites: CSD 485 and consent of instructor, 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.
585. Practicum in the School Setting. 10 credits. Prerequisites: Graduate standing and consent of the department. Supervised practicum in a University-approved cooperating school.
586. Advanced Clinical Practicum: Audiology. 1 to 16 credits. The administration and interpretation of tests and procedures for evaluation of human auditory functioning; practice involving interviews, case histories and client counseling.
592. Research Design in Speech and Hearing Sciences. 3 credits required.
595. Research Problems in Speech-Language Pathology—Audiology. 1 to 3 credits. Prerequisites: CSD 485 and consent of instructor. A study of special topics in communication disorders.
597. Independent Study. 2 credits.
998. Thesis. 4 credits.
999. Dissertation. 10 credits.
343. Language Development. 3 credits.
431. Introduction to Audiology. 3 credits.
434. Aural Rehabilitation. 3 credits.
497. Special Problems in Communication Disorders. 1 to 3 credits.

Computer Science
Professors: Grant, Hu, Kim, Liu, Marsh (Graduate Director), O’Neil (Chair), Reza and Wiggen

Program Description
The Department of Computer Science offers graduate study leading to the Master of Science degree. Both the thesis option and the non-thesis option are available. 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.

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 CAC/ABET-accredited degree program in Computer Science.

4. Eight prerequisites:
   1) Expertise in two high-level languages (CSci 161, 260)
   2) Basic knowledge of data structures (CSci 242)
   3) Basic knowledge of computer architecture (CSci 370)
   4) Basic knowledge of operating systems (CSci 451)
   5) Basic knowledge of formal languages, automata, and computability (CSci 435)
   6) Basic knowledge of discrete mathematics (Math 208)
   7) Completion of one year of calculus (Math 165 and 166)
   8) Completion of an additional course in statistics, probability, or linear algebra (Math 321, 327, 403, 421 or 442)

The department recognizes that the expertise identified above may be acquired in several ways, but the appropriate UND courses are listed as a guideline for prospective students. Students who do not meet all of these prerequisites may be admitted to Qualified status with the obligation of meeting the remaining requirements early in their graduate study but without graduate credit.

**Degree Requirements**

All students must complete the twelve-credit core of required courses, defined as follows:

1. Two courses from the list below:
   - CSci 522 Theoretical Foundations
   - CSci 532 Programming Languages and Paradigms
   - CSci 575 Analysis of Algorithms
   - CSci 565 Advanced Software Engineering

2. Two courses from the list below:
   - CSci 513 Advanced Database Systems
   - CSci 543 Advanced Artificial Intelligence
   - CSci 551 Distributed Operating Systems
   - CSci 555 Computer Networks

**Applied Software Engineering Track**

(Non-thesis option, 32 credit hours)

1. The core of required courses (12 credits).
2. Four or five elective courses (12-15 credits). CSci 500 may not be used as an elective. Only 3 credits of CSci 591 may be used as an elective.
3. The core and elective courses must include CSci 463 (Software Engineering) and either of CSci 565 (Advanced Software Engineering) or CSci 562 (Formal Specification Methods).
4. CSci 566, Software Engineering Project (3-6 credits), defined in consultation with the student’s Independent Study Adviser.
5. CSci 997, Independent Study (2 credits), a complete write-up of the Software Engineering Project in accordance with the department’s Software Engineering Project Report format requirements.
6. Successful completion of a written comprehensive examination on the areas covered in the core courses selected by the student.

**Computer Science Track**

(Thesis option, 30 credit hours)

1. The core of required courses (12 credits).
2. Four elective courses (12 credits). CSci 500 and CSci 566 may not be used as electives. Only 3 credits of CSci 591 may be used as an elective.
4. Successful completion of a written comprehensive examination on the areas covered in the core courses selected by the student.
5. A final oral examination, which includes a defense of the thesis.

**Courses**

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.

501. Topics in Computer Science. 1 to 3 credits. Prerequisite: Consent of instructor. Selected topics from current developments in Computer Science.

513. Advanced Database Systems. 3 credits. Prerequisite: CSci 455. A study of concurrency control, recovery, query processing and optimization, security, and new advancements including research issues in database systems.

522. Theoretical Foundations of Computer Science. 3 credits. Prerequisite: CSci 435. 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.

532. Programming Languages and Paradigms. 3 credits. A study of current topics in programming languages and paradigms. Course content may vary with current issues and student interests.

537. Graduate Cooperative Education. 1 to 3 credits. Prerequisite: A minimum of 9 graduate credits in Computer Science. 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. S/U grading only.

543. Advanced Artificial Intelligence. 3 credits. Prerequisite: CSci 365 or CSci 384. 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.

551. Distributed Operating Systems. 3 credits. Prerequisites: CSci 370; CSci 451; and one of CSci 327, CSci 427 or CSci 555. 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.

555. Computer Networks. 3 credits. Prerequisite: CSci 327. 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.

562. Formal Specification Methods. 3 credits. Prerequisites: CSci 435 and 463. A foundational course that introduces several formal specification techniques for construction and analysis of software artifacts. Included are rigorous program development, abstract data specication of modules, and modeling of concurrent and distributed software.

565. Advanced Software Engineering. 3 credits. Prerequisite: CSci 463. 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.

566. Software Engineering Project. 3 to 6 credits. Prerequisite: CSci 463. 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.

575. Analysis of Algorithms. 3 credits. Prerequisite: CSci 435. The time and space complexity of classical computer algorithms is analyzed. NP hard and NP complete problems are characterized and illustrated.

591. Directed Studies. 1 to 3 credits. Prerequisite: Graduate standing, consent of instructor. An investigation of some specific area by an individual or small group of students working closely with a member of the graduate faculty.

997. Independent Study. 2 credits. S/U only.


427. Advanced Data Communications. 3 credits.

445. Modeling and Simulation. 3 credits.


452. Operating Systems II. 3 credits.

455. Database Management Systems. 3 credits.

457. Electronic Commerce Systems. 3 credits.

463. Software Engineering. 3 credits.

465. Principles of Translation. 3 credits.

491. Seminars in Computer Science. 1 credit.
Counseling Psychology and Community Services

Professors: Juntunen (Ph.D. Graduate Program Director), Loewy (Chair), Perry, Pinterits, Wettersten and Whitcomb (Master’s Graduate Program Director)

Department Description

The Department of Counseling Psychology and Community Services (CPCS) 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 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 licensure 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.

Master of Arts in Counseling

The Master of Arts is appropriate for those who wish to become counselors in community agencies, such as addiction treatment clinics, mental health centers, rehabilitation centers, and family service organizations. The Master of Arts is also appropriate for those planning careers in college counseling and student development services and for those who wish to become counselors in elementary, middle, junior high, or high schools. A commitment to social justice and appreciation of diversity are integrated throughout the curriculum.

Admission Requirements

1. 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. Courses in psychology and sociology may be applied toward this prerequisite. Courses in other social science disciplines where the focus is on the description or explanation of individual or group behavior may be accepted in fulfillment of this prerequisite at the discretion of the department.

2. Admission is based on achievement in undergraduate work, satisfactory performance on the Graduate Record Exam General Test or the Miller Analogies Test, favorable recommendations and the admission committee’s perception of the “best fit” based on the applicant’s personal statement. In addition to the standard online application for UND, applicants must complete the “supplemental application form and undergraduate coursework summary” at the department’s website, www.counseling.und.edu.

Degree Requirements

Prerequisites: 20 hours of Behavioral Sciences, including Abnormal Psychology, Statistics, Personality Theory, and Developmental Psychology.

ADDITION Emphasis

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<td>Ethics</td>
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<tr>
<td>502</td>
<td>Prof. Issues</td>
<td>1 cr</td>
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<tr>
<td>510</td>
<td>Methods of Counseling</td>
<td>3 cr</td>
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<tr>
<td>515</td>
<td>Research</td>
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<td>516</td>
<td>Assessment in Counseling</td>
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<td>517</td>
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<td>519</td>
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<td>520</td>
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<td>522</td>
<td>Couples &amp; Family</td>
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<td>587</td>
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<td>2 or 4 cr</td>
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Total 48 (IS) or 50 (Thesis)

COMMUNITY AGENCY

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<td>Prof. Issues</td>
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<td>Addiction</td>
<td>2 cr</td>
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<tr>
<td>565</td>
<td>Child &amp; Adol</td>
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<td>565</td>
<td>Mid &amp; Older Adult</td>
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<td>565</td>
<td>Special Topics</td>
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<tr>
<td>585</td>
<td>Research Practicum</td>
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Total 48 (IS) or 50 (Thesis)

REHABILITATION Emphasis

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<td>506</td>
<td>Rehab: Foundations &amp; Ethics</td>
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<tr>
<td>510</td>
<td>Methods of Counseling</td>
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<tr>
<td>514</td>
<td>Rehab: Assess &amp; Eval</td>
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<td>515</td>
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<td>Research Lab</td>
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<td>518</td>
<td>Group Theory</td>
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<td>519</td>
<td>Career</td>
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<td>533</td>
<td>Couples &amp; Family</td>
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Total 51 (IS) or 53 (Thesis)

SCHOOL Emphasis

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<td>517</td>
<td>Assessment in Counseling</td>
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<td>522</td>
<td>Management: School Counseling</td>
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523 Elementary ................................................. 2 cr
525 Secondary .................................................. 2 cr
530 Theory ....................................................... 3 cr
531 Gender ........................................................ 3 cr
532 Multicultural .............................................. 3 cr
533 Couples & Family ......................................... 3 cr
581 School Counseling Practicum ...................... 4 cr
589 School Counseling Internship ..................... 6 cr
997/8 IS or Thesis .............................................. 2 or 4 cr

Total 49 (IS) or 51 (Thesis)

Students may enroll in the counseling practicum (COUN 580 or COUN 581) after they have satisfactorily completed at least ten credits in the program including: COUN 510: Counseling Methods; COUN 530: Theory; COUN 501: Ethics or COUN 506: Rehabilitation Counseling or COUN 550: Ethics and Professional Issues in Counseling Psychology. Students in the Addiction Emphasis may need additional coursework in order to be eligible for licensure as an addictions counselor in the state of North Dakota. This coursework includes the following: T&L 350: Development and Education of the Adolescent or COUN 565: Child and Adolescent Development; PSYC 451: Advanced Developmental Psychology or COUN 565: Middle and Older Adulthood; and PPT 410: Drugs Subject to Abuse.

After successfully completing practicum, students will enroll in an Internship in Counseling COUN 584, 587, 588 or 589, depending on program emphasis, which is a two-semester supervised counseling experience at an external site. Internship will typically be completed during the second year in the program for full-time students. Internship assignments are individually arranged and administered by the department’s Internship Coordinator.

In addition to this practitioner course sequence, students are required to complete a series of research training experiences, culminating in the completion of the Independent Study (COUN 997), an independent research project conducted under the direction of the student’s advisor. Students are encouraged to begin considering and planning their research project early in their program.

After completing the majority of coursework for the degree and advancing to candidacy, students are eligible to sit for the Master’s Comprehensive Examination, which is offered once each fall and spring semester. A passing score on the examination is required for graduation.

**Combined Program in Counseling with a Rehabilitation Emphasis**

**Program Description**

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.

**Admission Requirements**

The deadline for a completed application to be received in the Graduate School 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, RHS 250, RHS 309, RHS 310, and Parts IV, V, and VI in the RHS curriculum.
2. Minimum GPA of 3.0 in all undergraduate work.
3. Written statement of interest in Rehabilitation Counseling as a Profession.

Students are granted approved admission status in the Graduate School when they have completed a total of 125 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 and COUN 519.

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 the following 35 credits of graduate course work in the Counseling Department: 506, 510, 514, 515, 516, 518, 519, 530, 531, 532, 533, and 580.
3. Completion of 8 credits of COUN 588 – Rehab Counseling Internship.
4. Completion of either COUN 997, Independent Study (2 cr.) or COUN 998, Thesis (4 cr.).

**Doctor of Philosophy—Counseling Psychology**

**Program Description**

The program provides preparation at the Ph.D. level for employment in a variety of academic and human service settings. These settings include: community mental health agencies, private practice, college and university counseling centers, hospitals and medical centers, or college and university departments of counseling and psychology. The program provides preparation for licensure as a psychologist in North Dakota and is accredited by the American Psychological Association. The curriculum adheres to recommendations of the American Psychological Association for the preparation of counseling psychologists and reflects a model which equally emphasizes science and practice.

The program accepts students at the post bachelor’s and post master’s level. The Department is committed to diversity, particularly to training for Native Americans and Native American mental health issues.

**Admission Requirements**

1. For students accepted at the post master’s level, a 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.
2. Eighteen (18) semester credits of undergraduate psychology including coursework in general psychology, developmental psychology, abnormal psychology, personality theory, experimental and research methods, and statistics.
3. Graduate Record Examination—Verbal, Quantitative and Writing tests.

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 (or Analytic) subtests of the Graduate Record Examination, references, vocational training and experiences, career goals, and perceived “best fit” by the admissions committee based on the applicant’s personal statement and the research and clinical interests of the faculty. Doctoral graduates from a recent four year period have had the following average grades and
scores: undergraduate GPA 3.28, master’s GPA 3.74, GRE-V 526, GRE-Q 564 and GRE-A 610. A balance between numbers of male and female students is preferred in the program. Students from minority ethnic groups are encouraged to apply.

Degree Requirements
1. A major in Counseling Psychology, a minor in Psychology (24 credits).
2. Psychological foundations coursework in the following areas: biological bases of behavior, cognitive/affective bases of behavior, social psychological bases of behavior, and individual differences bases of behavior.
3. Two scholarly tools (of four courses each)—(1) Research Methods/Statistics and (2) Assessment/Diagnosis.
4. A qualifying exam.
5. Dissertation, successful completion of Qualifying Examination, Comprehensive Examinations, and completion of a 12-month APA approved pre-doctoral internship in Psychology.

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).

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: 510, 517, 519, 530, and 532. All doctoral students who wish to complete a minor in the department must include a CPCS faculty member on the Faculty Advisory Committee and should seek advice about appropriate courses and course sequences.

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.

Courses
501. Ethics in Counseling. 3 credits. Focus will be on 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 their professional practice.

502. Professional Issues in Counseling. 1 credit. Corequisite: COUN 501, only for students in the Community Agencies Emphasis and Addictions Emphasis. 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.

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.

510. Counseling Methods. 3 credits. Two training components are combined to provide an intensive practicum 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.

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.

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.

516. Counseling Research Laboratory. 1 credit. Prerequisite: COUN 515. 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.

517. Assessment in Counseling. 3 credits. Develop ethical, culturally competent, and psychometrically sound counseling assessment and test interpretation skills. Apply principles of counseling assessment to selected instruments in the areas of personality; career interests; educational and occupational achievements; and intellectual functioning and aptitudes.

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.

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.

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.

523. Elementary School Counseling. 2 credits. Exploration of models of elementary counseling and examination of counseling materials in implementing a counseling program.

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.


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 video tapes of simulated or actual counseling sessions, role play demonstrations, and role played practice of various theoretically based counseling interventions.

531. Psychology of Women, Gender and Development. 3 credits. The course presents current research and trends in developmental theory, particularly theories pertaining to the psychological development of women and men. Issues such as abuse, aggression, depression, eating disorders, emotional expression and experience, 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. S/U grading only.

532. Multicultural Counseling. 3 credits. This course offers an introduction to counseling theories and interventions appropriate for American ethnic and non-ethnic minority clients. The values suppositions of various cultural groups will be examined. In-class group experience is included.

533. Couples and Family Counseling. 3 credits. Prerequisite: COUN 510, or instructor approval. An introduction to the major theories of couples and family counseling and their associated interventions. A combination of readings, lecture, discussion, demonstrations and role-plays will be used.
540. Career Counseling Theories. 3 credits. Prerequisite: COUN 519 or equivalent; admission to doctoral program. Advanced study of major career counseling theories, models, and methods.

550. Ethics and Professional Issues in Counseling Psychology. 3 credits. Prerequisite: Admission to the doctoral program. Study and analysis of the ethical, legal, and professional issues of Counseling Psychology. Understanding and application of APA Ethical Guidelines will be emphasized. Professional issues include the history and development of Counseling Psychology as a profession, issues of professional identity, and current trends affecting the field.

551. Research Issues in Counseling Psychology. 3 credits. Prerequisite: Admission to the doctoral program. 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.

555. Advanced Psychological Testing. 3 credits. Prerequisite: COUN 517 or equivalent; admission to doctoral program. A critical examination of the rationale, construction, and uses of structured personality tests and inventory instruments, including current views of test validities and reliabilities, prediction models, and related observational techniques.

560. Supervision Theory and Technique. 3 credits. Prerequisite: Admission to the doctoral program or instructor permission. A survey and critical examination of approaches, techniques, and issues in providing supervision to counselors-in-training. Includes reading of current theory and research on supervision, critical analysis of approaches to supervision, demonstrations, and role-played experiences of different supervisory techniques.

565. Professional Seminars. 1 to 3 credits. Prerequisite: consent of instructor. Seminars are designed to present current research and supplement coursework in several areas. May be repeated up to eight credits. S/U grading only.

570. Assessment. 3 credits. Prerequisite: COUN 517 or equivalent and admission to the doctoral program or permission of instructor. Theory, research, evidence, and training in the administration, scoring, interpretation and use of personality assessment instruments. Clinical interviewing and checklists, behavioral observation, and report writing skills. Issues of race, ethnicity, gender, age, disability and the use of these instruments is emphasized. A two-hour lab provides supervised practice in test administration and scoring.

560. Cognitive Assessment. 3 credits. Prerequisite: COUN 517 or equivalent and admission to the doctoral program or permission of instructor. 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.

580. Counseling Practicum. 4 credits. Prerequisites: COUN 510; COUN 501, 506 or 550 or permission of instructor; COUN 530 or permission of instructor; 10 completed COUN credits. Introduction to counseling practice. Emphasis on development, improvement, and evaluation of counseling relationships. Interview skills in counseling practice with live supervision. S/U grading only.

581. School Counseling Practicum. 4 credits. Prerequisites: COUN 510; COUN 501 or 550 or 506 or permission of instructor; COUN 530 or permission of instructor; 10 completed COUN credits. Introduction to counseling practice in a school setting. Emphasis on development, improvement, and evaluation of counseling relationships. Develop skills in applying role of counselor to school environment. Interview skills in counseling practice with live supervision. S/U grading only.

583. Field Work. 3 credits. Prerequisite: Admission to doctoral program. 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. S/U grading only.

584. Community Counseling Internship. 4 credits. Prerequisite: Counseling 580. 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. S/U grading only. F.S. Department permission needed for SS enrollment.

585. Counseling Psychology Research Practicum. 1 to 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. S/U grading only.

586. Practicum in Supervision. 1 to 3 credits. Prerequisites: COUN 560. Supervised experience in providing supervision to counselors-in-training. Experience may be gained in supervising 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. S/U grading only.

587. Addictions Counseling Internship. 4 to 6 credits (up to 12 total). Prerequisite: Counseling 580. 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. S/U grading only. F.S. Department permission needed for SS enrollment.

589. School Counseling Internship. 3 to 4 credits (up to 8 total). Prerequisite: Counseling 581. Professional practice in counseling, assessment, consultation, teaching, or research in a school counseling setting. Supervision must meet criteria established by the department and the Graduate School. S/U grading only. F.S. Department permission needed for SS enrollment.

590. Problems in Counseling. 1 to 3 credits. Supervised independent study or application of selected problems in the counseling field. S/U grading only.

593. Readings in Counseling. 1 to 3 credits. Reading in selected areas of counseling. May be repeated up to six credits. S/U grading only.

596. Continuing Enrollment. 1 to 12 credits.

997. Independent Study. 2 credits.

998. Thesis. 4 credits.

999. Dissertation. 1 to 12 credits.

Criminal Justice

Professors: DiCristina, Gottschalk, Hume, Mayzer and Meyer (Graduate Program Director)

Program Description

Drawing on a broad array of multi-disciplinary resources, 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 and non-profit services, 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, 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 individuals holding a Juris Doctorate and wishing to meet educational requirements for teaching and research positions in criminal justice higher education programs.

Admission Requirements

In addition to the admission requirements of the Graduate School at the University of North Dakota, the following requirements must also be met:

C. Candidates, with the exception of those applying under the J.D./Ph.D. specialization, must complete all requirements leading to the awarding of an M.A./M.S. degree prior to enrollment in the doctoral program. The program is designed to prepare students for academic teaching and research, research in government and non-profit services, and higher-level administrative positions in criminal justice agencies.

Degree Requirements

Students entering the program, with the exception of those admitted to the J.D./Ph.D. specialization, will be required to complete a minimum of 60 credit hours in the doctoral program.

All students will be required to complete 9 semester hours of criminology theory and 15 semester hours of doctoral level research methods and analysis coursework and to successfully complete and defend a dissertation, upon which 18 additional credit hours will be awarded. In consultation with the student’s Graduate Student Advisory Committee, students not admitted to the J.D./Ph.D. specialization will be required to complete an additional 18 credit hours of electives leading to substantive specialization in one or more fields of criminal justice. A minimum of 9 elective credits must be taken in criminal justice courses not previously taken for graduate credit. Up to 9 elective credits, not previously taken for graduate credit, may also be selected from any courses approved for graduate credit at either the University of North Dakota or Minot State University.
All students will be required to successfully complete comprehensive examinations in criminology theory and research methods/analysis prior to submission and approval of their dissertation prospectus. Students not admitted under the J.D./Ph.D. specialization will also be required to successfully complete a comprehensive exam in one area of substantive concentration to be determined in consultation with the student’s advisory committee.

The Curriculum:

Theory

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<td>UND CJ 511</td>
<td>Contemporary Perspective in Criminology</td>
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<tr>
<td>UND CJ 515</td>
<td>Human Nature and Crime</td>
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Methods/Statistics

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<tr>
<td>UND CJ 525</td>
<td>Advanced Quantitative Methods/Analysis</td>
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<td>UND CJ 526</td>
<td>Special Topics in Quantitative Analysis</td>
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<td>UND EFR 520</td>
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<td>MiSU CJ 690</td>
<td>Data Analysis</td>
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Electives (18 credits)

- A minimum of 9 credits* must be taken from:
  - UND CJ 535 or MiSU CJ 635 Seminar in Juvenile Justice | 3 credits
  - UND CJ 540 or MiSU CJ 640 Seminar in Criminal Justice Policy | 3 credits
  - UND CJ 545 or MiSU CJ 645 Seminar in Rural Justice Issues | 3 credits
  - UND CJ 555 or MiSU CJ 630 Seminar in Tribal Justice Systems | 3 credits
  - MiSU CJ 520 Criminal Justice Administration | 3 credits
  - MiSU CJ 540 Criminal Justice Policy Analysis | 3 credits
  - MiSU CJ 530 Women and Crime | 3 credits
  - MiSU CJ 550 Law and Society | 3 credits
  - MiSU CJ 580 Occupational/Organized Crime | 3 credits
  - UND CJ 516 Theories of Punishment | 3 credits
  - UND CJ 565 Victimology | 3 credits
  - MiSU CJ 592 Special Topics | 3 credits

*In consultation with the student’s Advisory Committee, up to 9 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

Students who have successfully completed all requirements for, and have been awarded, a Juris Doctorate (J.D.) degree may complete the Ph.D. in Criminal Justice through meeting all requirements of the Theory and Methods/Statistics components of the doctoral program and successful defense of a dissertation.

OR

Students currently enrolled in an accredited law school, and who successfully complete the course of instruction leading to a Juris Doctorate, and successfully complete the Theory and Methods/Statistics components of the doctoral program, and upon successful defense of a dissertation, may be awarded a Ph.D. in Criminal Justice.

Dissertation ................................................................................................................................................. 18 cr.

TOTAL PROGRAM HOURS .......................................................................................................................... 60 cr.

Courses

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 perspectives ranging from the demonic perspective to the nature of crime and deviance.

511. Contemporary Perspectives in Criminology. 3 credits. A survey of contemporary criminological thought from the mid-twentieth century to the present. The course examines the growth of mainstream perspectives, e.g., strain/learning, and control theories, and critical criminology, e.g., Marxist, feminist, post-modern, and peacemaking perspectives.

515. Human Nature and Crime. 3 credits. An overview of human nature and crime from the mid-twentieth century to the present. The 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.

516. Theories of Punishment. 3 credits. An overview of the development of punishment from the middle ages to the present. The course examines the growth of mainstream viewpoints, e.g., societal, individual, and modern perspectives.

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.

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.

526. Special Topics in Quantitative Analysis. 3 credits. Prerequisites: CJ 525 or consent of instructor. 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 demands.

531. Seminar in Criminal Justice Policy. 3 credits. Prerequisite: Admission into Criminal Justice Ph.D. program. Variable topics addressing the administration of the juvenile justice system and juvenile justice policy. Course will consist of lectures, discussion, and readings.

540. Seminar in Criminal Justice Policy. 3 credits. Prerequisite: Admission into Criminal Justice Ph.D. program. 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.

545. Seminar in Rural Justice Issues. 3 credits. Prerequisite: Admission into Criminal Justice Ph.D. program. Variable topics addressing issues in the administration of policing, prosecution, courts, and corrections in rural areas. Course will consist of lectures, discussion, and readings.

555. Seminar in Tribal Justice Systems. 3 credits. Prerequisites: Admission into Criminal Justice Ph.D. program and IS 375. Variable topics addressing the administration of criminal justice in Indian territory. Course will consist of lectures, discussion, and readings.

565. Victimology. 3 credits. Prerequisite: Admission into Criminal Justice Ph.D. program. This course provides an overview of the role of the victim in the American criminal justice system. Course 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.

590. Practicum: Research. 1-6 credits. Prerequisite: consent of instructor. 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. S/U grading.

597. Administrative Internship. 1-6 credits. Prerequisites: Admission into Criminal Justice Ph.D. program, consent of instructor. Students are employed on a full-time or part-time basis in the administration of criminal justice agencies of federal, state or local governments. Students are required to produce an analytical report based on intern responsibilities. S/U grading.


599. Dissertation. 1-12 credits, repeatable to 18 credits. Prerequisites: Successful completion of comprehensive exams, consent of department. Original research project suitable for publication. S/U grading.

Earth System Science and Policy

Professors: Hanley (Chair and Graduate Director), Hill, Kirilenko, Laguette, Romsdahl, Seielstad and Zhang

Program Description

The graduate program in Earth System Science and Policy is organized around the field of environmental sustainability and offers three degrees: Master of Science in Earth System Science, 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. The mission of the ESSP graduate program is to
provide an integrated and creative learning environment that fosters intellectual growth, critical thinking, and practical engagement in research and management of the Earth system and resources. The ESSP program is a thematic one, emphasizing practical experience, student-centered learning, integration of knowledge across traditional disciplinary boundaries, and active dialogue both in and outside the classroom.

To achieve the ESSP program’s 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 program’s learning objectives include: a student-structured curriculum, a multi-disciplinary teaching approach, and experiential learning environments.

2. **Excellence in discovery.** Research within the 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 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, program goals specifying learning outcomes for graduates of the program 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 **basic science, applications-driven science, geographical information systems (GIS), remote sensing, environmental policy, and statistics.**

3. Valuable **hands-on experiences** and the ability to conduct **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 **multidisciplinary teams** to accomplish goals of interest to the group.

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 possess a broad sense of ethical and professional responsibilities.

8. An awareness and preparation for a **lifetime of learning.**

**Admission Requirements**

In addition to the admission requirements of the University of North Dakota Graduate School, students must fulfill the requirements below for admission to Earth System Science and Policy graduate degree programs.

**Master of Environmental Management (MEM) and Master of Science (MS)**

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. **MEM:** Have completed a minimum of 6 semester credits in the natural sciences AND 6 semester credits in social sciences, e.g., economics, sociology, psychology, political science, anthropology/archeology, or related fields.

4. **MS:** Have completed a minimum of 12 semester credit hours in natural or physical sciences, e.g. physics, chemistry, geosciences, biology or related sciences.

5. Have earned a minimum average GPA of 3.00 on a 4.00 scale, on all upper division college-level coursework.

6. Graduate Record Examination (GRE) General Test.

**Doctor of Philosophy (PhD)**

1. Hold a Master’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, 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. Graduate Record Examination (GRE) General Test.

**Financial Assistance**

Graduate assistantships may be available to qualified students.

**Degree Requirements**

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.

Students enrolled in the MEM, MS, and (in most cases) PhD degree programs will all take the sequences ESSP501, 501R, 501L (offered in the Fall) and 502, 502R, 502L (offered in the Spring). All students will complete the basic two-semester core sequence of courses during their first year of study. Thereafter, the course selection will vary according to the degree sought and the specific interest of the student. Each student’s academic advisory committee will design a customized curriculum.

**Master of Environmental Management (MEM)**

The Master of Environmental Management is a professional degree for those who seek careers as environmental policymakers. Graduates of the MEM program will have a comprehensive knowledge of the principles of environmental and natural resource management, acquired through practical experience in an internship. A final written and oral report of the project completed must be submitted.

A minimum of 36 credits, including six to nine credits for internship is required. ESSP MEM students must file with the Graduate School an approved program of study before the completion of fifteen credits of coursework, maintain a GPA of 3.00, and comply with the requirements of the graduate school. Grades of “C” or poorer will not be accepted as fulfilling degree requirements.

All students must take oral and written examinations to qualify for candidacy in the MEM program. These will occur no later than the end of the first year of coursework and will entail a 5 to 10 page written description and an oral presentation of their intended intern-
ship project. All exams will be administered and evaluated by the student’s Advisory Committee. MEM students must fulfill all requirements outlined by the Graduate School for a master’s degree. In place of a thesis, they must submit a comprehensive written report of their internship with an appropriate organization. The written report will be in the form of an Independent Study Report, following the guidelines and procedures for such a report set by the Graduate School. In addition, students shall make a final oral presentation to an audience from the ESSP program, stakeholders affected by their project, and relevant professionals.

Master of Science (MS)
The Master of Science in ESSP is designed to accommodate a large range of research interests, all of which must be multi-disciplinary. Those who are highly focused in a particular discipline are encouraged to seek graduate opportunities in that discipline. Requirements for an MS degree will culminate in submission and defense of a thesis.

A minimum of 36 credits beyond the baccalaureate is required, including six to nine credits for thesis. 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 one 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.

ESSP MS students must file with the Graduate School an approved program of study before the completion of fifteen credits of coursework, maintain a GPA of 3.00, and comply with the requirements of the graduate school. Grades of “C” or poorer will not be accepted as fulfilling degree requirements.

All students must take 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 5 to 10 page written description and an oral presentation of their intended research project. Successful completion, and oral defense, of a thesis is required for the MS degree. All exams will be administered and evaluated by the student’s Advisory Committee.

Doctor of Philosophy (PhD)
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, remedies, or prevents a significant environmental problem of the present and the future. The program is multi-disciplinary and practical in nature, involving faculty from various disciplines and institutions, from public or private research laboratories, and stakeholders.

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. All PhD students will be required to spend a minimum of two semesters, full-time, on the UND campus after receiving a master’s degree.

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 Graduate School. 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.

ESSP PhD students must file with the Graduate School an approved program of study by the end of their second semester, complete at least six credits of the approved program per academic year, maintain a GPA of at least 3.00 with no grades below “B”, and comply with the requirements of the graduate school. 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.

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. All exams will be administered and evaluated by the student’s Advisory Committee.

Courses

502. Earth System Science and Policy II. 5 credits. Prerequisites: ESSP 501, 501R, 501L. Corequisites: ESSP 502R, ESSP 502L. 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.

502R. Earth System Science and Policy Recitation. 3 credits. Prerequisite: Graduate standing in ESSP. Corequisites: ESSP 501, 501R, 501L. Small group discussions to include many parties to an environmental issue.

501L. Earth System Science and Policy Laboratory I. 2 credits. Prerequisite: Graduate standing in ESSP. Corequisites: ESSP 501, 501R. Laboratory session. Will require one or more full day field trips; may require one or more weekend field trips.

510. Environmental Systems, Theory and Practice. 3 credits. Prerequisites: ESSP 501, 501R, 501L. An overview of the fundamental principles of modeling in the Earth System Sciences. Development of models to account for the physical, chemical, biological, and ecological complexity of natural systems. Focus on the development of a personal research agenda that integrates basic science knowledge and advanced modeling techniques.

511. Advanced Topics in Geospatial Technologies. 3 credits. Prerequisite: Consent of instructor. Course content is determined by the instructor and student. 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. Areas of technologies to be discussed include various sensors and platforms and their use in science, data acquisition and image processing tools, validation and verification techniques, precision navigation by Global Positioning Satellites, and advanced uses of Geographic Information Systems.

562. Environmental Economics, Policy and Management. 3 credits. Prerequisite: Consent of instructor. 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.

570. **Communicating Environmental Information.** 3 credits. Prerequisite: Consent of instructor. The focus of this class is on communication of 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.

590. **Colloquium Series.** 1 credit. Speaker series, approximately weekly, on timely topics and research. An emphasis will be to feature outside speakers. Speakers may occasionally deliver presentations electronically. Graduate students in ESSP are expected to attend.

594. **Directed Study.** 1-5 credits. Prerequisite: Permission of an ESSP faculty member who agrees to serve as supervisor. 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.

596. **Doctoral Research.** 1-15 credits. Prerequisite: Graduate standing in ESSP, or consent of instructor. Arranged with student’s advisory committee. May be repeated for credit.

597. **Internship.** 3-9 credits. Prerequisite: Graduate standing in ESSP. Practical experience for ESSP students in a professional environment.

599. **Special Topics.** 1-6 credits. Prerequisite: Graduate standing in ESSP, or consent of instructor. Topics of current interest. May be provided by program or visiting ESSP faculty. May be repeated for credit.

997. **Independent Study.** 2 credits. Prerequisite: Approval by student’s advisor of written proposal describing internship to be completed. Independent study and preparation of written and oral reports describing internships.

998. **Thesis.** 3-9 credits. Prerequisite: Graduate standing in ESSP. 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 masters degree program.

999. **Dissertation.** 3-18 credits. Prerequisite: Consent of instructor. 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.

EDUCATION

**Professors:** Anderson, Baker, Barrentine, Chalmers, Chiasson, Combs, Gershman, Gourneau, Guy, Healy, Helgeson, Hjelmstad, Holdman, Holen, Houdek, Ingwangson, Kallio, Landry, Lemire, Mahar, Olsen, Olson, Pearson, Rice, Schnellert, Smart, Sun, Tepper, Van Eck, Walker, Weaver-Hightower and Zidon

Graduate programs in Education are housed in three departments of the College of Education and Human Development. Faculty in the Departments of Educational Foundations and Research, Educational Leadership, and Teaching and Learning work closely together in design and delivery of the graduate programs described in this section. The department chairs and program coordinators are listed below.

**Department Chairpersons**

Educational Foundations and Research .................. K. Gershman
Educational Leadership ........................................ M. Healy
Teaching and Learning ........................................... G. Olsen

**Program Coordinators**

Early Childhood Education .............................. G. Olsen
Educational Leadership ........................................ M. Healy
Elementary Education .......................................... B. Gourneau
Education, General Studies .................................. M. Zidon
Reading Education ............................................. S. Barrentine
Special Education ............................................... L. Chalmers
Teaching and Learning Doctoral Program ............... C. Shabb

Graduate programs in education at UND are accredited by the National Council for the Accreditation of Teacher Education (NCATE) through 2008 reaccreditation, 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 to advanced programs for educators students 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**

**Program** | **Degrees Available**
--- | ---
Early Childhood Education | M.S.
Educational Leadership | M.Ed., M.S., Ed.S., Ed.D., Ph.D.
Education-General Studies | M.S.
Elementary Education | M.Ed., M.S.
Reading Education | M.Ed., M.S.
Special Education | M.Ed., M.S.
Teaching and Learning | Ed.D., Ph.D.

**Degrees Offered**

The Master of Education (M.Ed.) and the Specialist Diploma (Ed.S) focus graduate study 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 of this catalog for a discussion of M.Ed and Specialist Diploma requirements.

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.

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 this Catalog for delineation of require-
ments 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 Graduate School referenced in the paragraphs above, the requirements of the Education faculty in the following section, 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.

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.

Scholarly Tools

The scholarly tool requirement for the M.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: EFR 510 Qualitative Research Methods (3 semester credits), EFR 520 Advanced Qualitative Research Methods (3 semester credits), and EFR 516 Statistics II (3 semester credits) or their equivalents, plus 3 credits of approved electives.

Option 2: Quantitative emphasis option: EFR 510 Qualitative Research Methods (3 semester credits), EFR 516 Statistics II (3 semester credits), and one of the following: EFR 517 Advanced Research Methodologies (3 semester credits), EFR 518 Multivariate Analysis (3 semester credits), EFR 519 Research Seminar-Experimental Design (3 semester credits) or their equivalents, plus 3 credits of approved electives.

Option 3: Tests and measurements option: EFR 511 Curriculum Evaluation (3 semester credits), EFR 512 Educational Tests & Measurements (3 semester credits), EFR 516 Statistics II (3 semester credits), and EFR 517 Advanced Research Methodologies (3 semester credits) or their equivalents.

The student’s advisory committee may approve an exception to these three specializations upon consultation with the research faculty. An appropriate exception would be a different sequence of studies that assures breadth and depth in the research process that is related to both the student’s career goals in research and in regard to the student’s research.

For the Ed.D., the minimum scholarly tool requirements of six credits may be met by one of the following options:

Option 1: Qualitative emphasis option: EFR 510 Qualitative Research methods (3 semester credits), EFR 520 Advanced Qualitative Research Methodologies (3 semester credits) or their equivalents.

Option 2: Quantitative emphasis option: EFR 516 Statistics II (3 semester credits), and one of the following: EFR 517 Advanced Research Methodologies (3 semester credits), EFR 518 Multivariate Analysis (3 semester credits), EFR 519 Research Seminar-Experimental Design (3 semester credits) or their equivalents.

Option 3: Tests and measurements option: EFR 511 Curriculum Evaluation (3 semester credits), EFR 512 Educational Tests & Measurements (3 semester credits), EFR 516 Statistics II (3 semester credits), and EFR 517 Advanced Research Methodologies (3 semester credits) or their equivalents.

The student’s advisory committee may approve an exception to these three specializations upon consultation with the research faculty. An appropriate exception would be a different sequence of studies that assures breadth and depth in the research process that is related to both the student’s career goals in research and in regard to the student’s research.

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.

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 degree and having been notified of eligibility in writing by the Graduate School. Students enrolled in the following master’s programs complete a Final Project in lieu of comprehensive exams: Early Childhood Education, Elementary Education, General Studies, Reading Education, and Special Education.

Department of Educational Foundations and Research

Professors: Gershman (Chair), Landry, LeMire, Weaver-Hightower and Williams

The Department of Educational Foundations and Research provides programs for educators and other professionals interested in educational foundations, educational evaluation, and/or educational research. The department is committed to the encouragement of interdisciplinary efforts and to increased understanding of our multicultural society.

The department cooperates with the Department of Teaching and Learning in offering an M.S. in Education—General Studies and doctoral work in teaching and learning with an emphasis in research methodologies. See the descriptions under Teaching and Learning for
the details related to these programs. Students are admitted to these programs following procedures established by the college.

**Courses**

500. Foundations of Educational Thought. 3 credits. A problem-centered class dialog on those philosophical, social, political and historical concepts of educational thought that have shaped the development of the learning experience.

501. Psychological Foundations of Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. 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. Theories of learning and theories of instruction are considered.

502. Issues and Trends in Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. Examination of contemporary issues of education and some of the political, social, and historical foundations which influence their development.

503. Historical Foundations of Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. 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 trends of ideas and changing institutions.

504. Philosophical Foundations of Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. A study of the representative schools of thought which have structured major philosophies of education.

505. Social Foundations of Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. The study of schools and education in social contexts such as community, politics, equity, race, class, gender, and social reproduction.

506. Multicultural Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. 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.

507. Gender and Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. 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 schooling of females and males.

508. Anthropological Foundations of Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. 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.

509. Introduction to Educational Research. 3 credits. An introduction to the research methodologies used to study education. The course covers qualitative as well as quantitative types of research. The paradigms of both types of research will be contrasted and the application of the methodologies in actual research investigated.

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 will learn the fundamental data collection methods: observation, participant-observation, and interviewing, as well as data analysis through coding and categorizing.

511. Curriculum and Program Evaluation. 3 credits. A study of the theoretical models of curriculum and program evaluation theory. Emphasis on the analysis of models for implementation and application in various educational and social programs.

512. Educational Tests and Measurements. 3 credits. Prerequisite: EFR 500 or consent of the instructor. An introduction to the major statistical techniques of educational measurement and the interpretation of test results.

513. Educational Measurement. 3 credits. Prerequisite: EFR 500 or consent of the instructor. A study of the methods of measurement of educational achievement. Emphasis on the construction and use of tests of educational achievement.

514. Educational Tests and Measurements. 3 credits. Prerequisite: EFR 500 or consent of the instructor. A study of the methods of measurement of educational achievement. Emphasis on the construction and use of tests of educational achievement.

515. 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.

516. Multivariate Analysis. 3 credits. Multiple regression in generalized probability theory; 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.

517. Research Seminar. 1 to 4 credits. Experimental Design—An in-depth treatment of analysis of variance designs including factoral designs, treatment by subject 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.

520. Advanced Qualitative Research Methods. 3 credits. Prerequisite: EFR 510 or consent of instructor. 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.

521. Seminar in Foundations of Education. 1 to 4 credits. Advanced consideration of selected topics in Foundations of Education. May be repeated for credit with change of topic.

584. Internship in Educational Research. 1 to 8 credits. Prerequisites: Appropriate coursework in educational research and consent of the adviser and department chair. Practical experience in the conduct of educational research, analyzing data, and writing reports. Available for doctoral level students only. May be repeated.

590. Special Topics in Education. 1 to 4 credits. Prerequisite: Consent of instructor or advisor. Exploration of special topics in the study of education not regularly included in available course offerings. May be repeated for different topics.

591. Readings in Education. 1 to 4 credits. Prerequisites: Consent of advisor and instructor. Designed primarily for advanced graduate students. May be repeated for different topics.

592. Individual Research in Education. 1 to 4 credits. Prerequisites: Consent of advisor and instructor. May be repeated.


**Department of Educational Leadership**

Professors: Healy (Chair and Graduate Program Director), Hjelmstad, Houdek, Kallio, Rice, Schnellert and Sun

The Department of Educational Leadership serves educational communities by preparing ethical leaders with knowledge, vision, and skills, by conducting research, and by providing service.

**Admission Requirements**

Minimum requirements for admission to the M.Ed. and M.S. degree programs:

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 public schools apply to the M.Ed. program, others to the M.S. program.
3. All applicants are required to respond to essay questions provided in the application packet.

Minimum requirement for admission to the Specialist Diploma, the Ed.D., and the Ph.D. programs:

1. Normally a master’s degree in educational leadership or a closely related field is required.
2. A minimum GPA of 3.5 in all prior graduate work.
3. All applicants are required to respond to essay questions provided in the application packet.

**Degree Requirements**

**Master of Education**

The M.Ed. program in Educational Leadership is designed to prepare students for administrative positions in either elementary or secondary schools. Upon completion of the M.Ed. degree, a student will have completed the requirements for the North Dakota principal credential at either the elementary or secondary level. Applicants for the M.Ed. must be licensed to teach and it is recommended they have a minimum of one year of teaching experience.

M.Ed. Degree (K-12 emphasis)

EDL 501 .. Leadership Planning and Organizational Behavior ... (3) EDL 503 .. Seminar: Orientation ........................................... (1)
EDL 511. Personal Communications and Ethics .................. (3)  
EDL 513. Curriculum Instruction and Learning Theory ........ (3)  
EDL 514. Personnel Supervision and Staff Development ....... (3)  
EDL 515. Educ. Law and Organizational Structure of Schools ............................................. (3)  
EDL 516. Policy and Finance ........................................... (2)  
EDL 519. Principalship (and one practicum): ...................... (2)  
EDL 520. Middle School Principalship .............. (1)  
EDL 521. Elementary School Principalship ....... (1)  
EDL 522. Secondary School Principalship ....... (1)  
EDL 997. Independent Study ........................................... (2)  

**Research and Foundations/Cognate**

EFR 500. Foundations of Educational Thought .................. (3)  
EFR 509. Introduction to Educational Research .................. (3)  
Electives ................................................................. (3)  
Total for Degree 32 credits

**Master of Science**

The M.S. program in Educational Leadership is designed for students whose goals are to obtain positions as administrators in higher education and/or K–12 education. Students who are interested in a career in higher education administration or other education-related areas are encouraged to apply for the M.S. degree program. Upon completion of the M.S. degree, students are better prepared for entry level and mid-management positions in educational institutions and agencies. Students who are interested in a career at the K–12 level and do not meet the requirements for admission to the M.Ed. may elect to earn an M.S. degree.

**M.S. Degree (Higher Education Emphasis)**

EDL 501. Leadership Planning and Organizational Behavior .... (3)  
EDL 503. Seminar: Orientation ........................................ (1)  
EDL 511. Personal Communications and Ethics .................. (3)  
EDL 541. Introduction to Higher Education ....................... (3)  
Select three of the following four courses: (9)
- EDL 546. The College Student ................................. (3)  
- EDL 547. Collegiate Environments .......................... (3)  
- EDL 548. Program Development ......................... (3)  
- EDL 549. Management of Higher Education ....... (3)  
EDL 593. Internship .................................................. (3)  
EDL 997. Independent Study ........................................ (2)  

**Research and Foundations/Cognate**

EFR 500. Foundations of Educational Thought .................. (3)  
EFR 509. Introduction to Educational Research .................. (3)  
T&L 570. History of Higher Education in the U.S. ............ (3)  
Total for Degree 33 credits

**M.S. Degree (K–12 Emphasis)**

EDL 501. Leadership Planning and Organizational Behavior .... (3)  
EDL 503. Seminar: Orientation ........................................ (1)  
EDL 511. Personal Communications and Ethics .................. (3)  
EDL 513. Curriculum Instruction and Learning Theory ........ (3)  
EDL 514. Personnel Supervision and Staff Development ....... (3)  
EDL 515. Educ. Law and Organizational Structure of Schools ............................................. (3)  
EDL 516. Policy and Finance ........................................... (2)  
EDL 997. Independent Study ........................................... (2)  

**Research and Foundations/Cognate**

EFR 500. Foundations of Educational Thought .................. (3)  
EFR 509. Introduction to Educational Research .................. (3)  
Electives ................................................................. (6)  
Total for Degree 32 credits

**Specialist Diploma**

The Specialist Diploma, available at UND only in Educational Leadership, is designed for students preparing for school administra-
tive 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.

**Doctor of Education**

The Ed.D. program in Educational Leadership is designed primarily for practitioners preparing for school administration positions including elementary or secondary principalships, superintendentships, curriculum directorships, or other school district central office positions. Upon completion of the Ed.D. degree, a student generally will have completed the requirements for an administrative credential including those required for the position of school superintendent in North Dakota.

**Doctor of Philosophy**

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.

**Doctoral Residence**

All students enrolled for doctoral study must meet the university and department residency requirements. Doctoral students are admitted to a cohort-based program. Coursework is delivered over a three-year period. Participation in this program meets the residency requirement of the Graduate School. Persons interested in applying to this program should contact the department for more detailed information.

For information about admission, residency requirements, program of study, or other degree requirements, please contact the chair of the Department of Educational Leadership.

**Courses**

501. Leadership, Planning, 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.

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.

503. Seminar in Educational Leadership. 1 to 4 credits. S/U grading only.

511. Personal Communications and Ethics. 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; and follow a professional code of ethics and values.

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.

513. Curriculum, Instruction, and Learning Theory. 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.

514. Personnel 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; supervis- ing and coordinating the implementation of program-level curriculum; providing feedback on teaching methods to area administrators. Topics to be studied include organizational structure of schools, federal and state court systems, church-state issues, teacher rights, student rights, rights of students with disabilities, instructional issues, tort liability, and equal opportunity in education.

501. Policy and Educational Finance. 2 credits. Includes such topics as the or- ganization 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.

502. Social, 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 ex- pected to apply political concepts and strategies and approaches to collaboration in involving the community in decision making, building community support for integrat- ing health and social services in support of students, and developing community sup- port for school priorities. Throughout the course, students’ work will be expected to manifest a sensitivity to issues of diversity in a pluralistic society.

519. Principalship. 2 credits. This course provides school leaders with an under- standing of the role of the building principal along with skills and techniques associ- ated with the principalship. The topics include the principal’s role in community and family relationships, collaboration, evaluation, and accountability. Topics will include the aca- demic and social needs of students and families, the development and application of policies related to students and staff, planning and delivery of curricular and co- curricular programs within the school, and the principal’s role in working with staff. Students will be introduced to one-credit field studies (EDL 500, 521 or 522) appropriate for their desired level of preparation for the principalship.

520. Middle School Principalship. 1 credit. Corequisite: EDL 519. This course provides a field-based experience in the role of the middle school principal.

521. Elementary School Principalship. 1 credit. Corequisite: EDL 519. This course provides a field-based experience in the role of the elementary school principal.

522. Secondary School Principalship. 1 credit. Corequisite: EDL 519. This course provides a field-based experience in the role of the secondary school principal.

523. Financing and Planning. 2 credits. Planning, budgeting, and controlling financial resources are major activities for school administrators. This course stresses the planning, budgeting, and controlling of financial resources and the use of accounting practices to determine the financial condition of an institution.

524. Educational Personnel Administration. 2 credits. Study of selection, as- signment, evaluation, development, and release practices for certified and non-certified school personnel; salary and contract administration in schools.

526. Business Management in Education. 2 credits. Study of the business func- tion in educational organizations with emphasis on budget development and administra- tion, accounting, purchasing, risk management, support services, and capital outlay.

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 stu- dents’ rights, and tort liability of educational organizations and their officers. Consider- ation is given to legal research and policy analysis.

529. Special Education Law. 3 credits. A course designed to give participants a working knowledge of the legislative, judicial, and administrative changes which have occurred in the area of special education and special education teacher certification programs. The course will provide information useful to administrators, practitioners, attorneys, parents, and ad- vocates on topics including: student records, discipline, related services, due process, least restrictive environment, and appropriate education.

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.

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.

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, griev- ance procedures, and results of the negotiations.

536. Administration of Middle School Curriculum. 1-3 credits. Prerequi- site: EDL 513. Designed primarily for graduate students seeking positions as curricu- lum coordinators or administrative positions. A study of leadership skills for developing the administrator’s understanding of knowledge construction, adult learning, plan- ning and implementing a framework for curriculum design and instruction, and the pro- fessional responsibility for assessing and implementing the middle school level curriculum. The course examines the current issues, trends, subject areas, student achieve- ment, 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 management of the middle school level curriculum. This course also provides an opportunity for students to develop the models of program design and its implementation to support student achievement.

537. Administration of Secondary School Curriculum. 1-3 credits. Prerequi- site: EDL 513. Designed primarily for graduate students seeking positions as curricu- lum coordinators or administrative positions. A study of leadership skills for develop- ing the administrator’s understanding of knowledge construction, adult learning, plan- ning and implementing a framework for curriculum design and instruction, and the pro- fessional responsibility for assessing and implementation of secondary curriculum. The course examines the current issues, trends, subject areas, student achievement, and chal- lenges for the future of middle school level curriculum. The student will research the current best practices for application of administrative skills in relationship to supervi- sion of a comprehensive 9-12 grade level curriculum and its impact on learners.

541. Introduction to Higher Education Administration. 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.

542. Curriculum in Higher Education. 2 credits. A study of processes for plan- ning, implementing, and evaluating curriculum within institutions of higher education. Topics will include historical perspectives on curriculum in higher education, govern- ance systems related to curriculum development and adoption, and issues of current interest and concern.

546. 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, psycho- social, and spiritual development. Further, the course will examine some of the unique sources of identity including gender, race, culture, ethnicity, and sexual identity.

547. Collegiate Environments. 3 credits. This course will discuss how student characteristics influence student educational and development needs, and the effects of the college experience on student development and development. This course will also exam- ine collegiate environments and how students’ person-environment interactions af- fect their development.

548. Program Development. 3 credits. This course will examine the theoretical 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 de- velop facilitation skills essential to the delivery of educational programs.

549. 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 as well as the management is- sues. Students will be introduced to professional issues, ethics, standards of practice as well as legal issues.

551. 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 instruc- tion, program evaluation, assessment, planning, faculty workload evaluation, and the profession of administrator.

552. Higher Education Law. 2 credits. An overview of the legal issues that con- front college and university personnel. Pertinent federal and state statutes as well as case law will be used to instruct on legal rights and responsibilities of students and college administrators. The legal relationships between the institution and the faculty, the student, the state government, and the federal government will be explored.

553. Higher Education Policy and Finance. 2 credits. An overview of the rela- tionship between fiscal policy and decision making in institutions of higher education. The sources of revenue for higher education will be studied as well as the budgeting, accounting, and auditing procedures applicable to nonprofit institutions. The college administrator’s role in guiding the fiscal welfare of an institution of higher education will be explored.

554. Higher Education Student and Support Services. 2 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.

556. Seminar in Elementary School Curriculum. 1-4 credits. Prerequisite: S/U grading only.

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 the curriculum, and decision-making activities; preparation of news releases and public information materials; study of relationships to media personnel.

572. Educational Systems and Planning. 2 credits. A study of the planning process including topics such as establishing goals; assessing needs; identifying re- sources; planning, implementing, analyzing, advocating, and selecting alternatives. Processes and techniques in planning will be emphasized.

573. Administration and Organizational Behavior I. 1-3 credits. A study and critique of selected theories and research in administration and organizational behavior including topics such as leadership, organizational design and culture; change and intervention; motivation and morale; interpersonal relations and conflict management; small-group processes; and personality, values, and ethics.
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.

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.

579. Special Topics in Educational Leadership. 1 to 4 credits. Prerequisite: Consent of instructor or advisor. Exploration of special topics in the study of educational leadership not regularly included in available course offerings. May be repeated for different topics.

593. Internship in Educational Leadership. 1 to 8 credits. Prerequisites: Appropriate foundational, cognate, and major area coursework and consent of the advisor and instructor. This is a culminating experience primarily for Specialist Diploma and doctoral students. May be repeated.

597. Readings in Educational Leadership. 1 to 4 credits. Prerequisites: Consent of advisor and instructor. Designed primarily for advanced graduate students. May be repeated for different topics.

599. Individual Research in Educational Leadership. 1 to 4 credits. Prerequisites: Consent of advisor and instructor. May be repeated.

Department of Teaching and Learning

The Department of Teaching and Learning prepares teachers for Pre-K-12 schools and for higher education; offering bachelors, masters, and doctoral degrees. A strong commitment to the intertwined processes of teaching and learning is evident throughout all graduate level programs. The personalization of reflective practice within a community of supportive students and faculty is emphasized. Scholarly inquiry and its application are encouraged. Support is available for the development of interdisciplinary perspectives and the cultivation of collaborative activities. Practices which promote progressive education, affirm diversity, and provide experiences whereby learners construct their own knowledge are highly valued.

Programs Offered

Program Degrees Available
Early Childhood Education ......................... M.S.
Education: General Studies ......................... M.S.
Elementary Education .................................. M.Ed., M.S.
Reading Education ..................................... M.Ed., M.S.
Special Education ....................................... M.Ed., M.S.
Teaching and Learning ............................... Ed.D., Ph.D.

See the Education departmental section for information regarding admissions, review processes, scholarly tools, thesis and independent study reports, comprehensive examinations, and study of higher education.

Early Childhood Education

Program Description

The focus in this 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 3 through grade 3 by concentrating on the study of children ages 3-8 and the implications such study holds for educational practice. Those pursuing this program will be prepared as professional teachers/leaders in a variety of early childhood settings, including public and private schools (K-grade 3), Head Start programs, child development and child care centers, and other programs relating to the education of children.

Admission Requirements

An undergraduate degree in early childhood education, child development, elementary education, or a related field.

Refer to the Admissions section of the Graduate catalog for additional information on admission requirements and application procedures.

Degree Requirements

A detailed description of the M.S. degree can be found in the Degree Requirements section. The M.S. degree in Early Childhood Education is available in two options: the thesis option and the non-thesis option. The program of study is developed together with the student’s advisor (in the case of a non-thesis option) or with the student’s thesis committee (in the case of the thesis option) and consists of a minimum of 30 credit for the thesis option and 32 credits for the non-thesis option. Required and elective courses are as follows:

Major: Credits
T&L 510 Early Intervention for Children with Special Needs .......... 2
T&L 526 Play in Development and Early Childhood Education ....... 2
T&L 527 Curricular Foundations in Early Childhood Education ...... 3
T&L 529 Language Development in Children .......................... 3
T&L 530 Foundations of Reading Instruction ............................ 3
T&L 547 Young Children’s Thinking ..................................... 2
T&L 553 Collaborative Relationships: Home School, Community .. 3
*Electives (thesis option) ....................................................... 3-5
or (non-thesis option) ...................................................... 9
T&L 995 Scholarly Project .................................................... 2
or T&L 997 Independent Study .............................................. 2
or T&L 998 Thesis ................................................................. 4-6

Scholarly Tools:
EFR 509 Introduction to Educational Research .................. 3
T&L 569 Action Research .................................................. 3
*Electives: The student will choose electives in consultation with his/her advisor or committee. Students who have not had direct experience working with young children should take T&L 580 Practicum: Early Childhood Education. If students do not have a teaching certificate, they are required to take EFR 500 Foundations of Educational Thought. Students can also take additional electives in Reading Education, Special Education, Social Work, or Educational Leadership.

Elementary Education

Program Description

The focus of the master’s degree programs in elementary education is on the advanced professional preparation of the classroom teacher. Courses, independent study, and practicum experiences are available in many of the curriculum areas. Goals of the program are to encourage teachers to work more intensely with individuals, be more effective as classroom teachers, and make a broader contribution in the education field.

Licensed teachers with a bachelor’s degree in elementary education may pursue either the Master of Education or the Master of Science. Non-licensed individuals who have earned a bachelor’s degree in a field of study other than education may only pursue the Master of Science.

Admission Requirements

1. Teacher Licensure for the M.Ed.
or
2. Teacher Licensure or a baccalaureate degree for the M.S.

Refer to the Admissions section of the Graduate catalog for additional information on admission requirements and application procedures.
Degree Requirements

A detailed description of the M.Ed. and M.S. degrees may be found in the Degree Requirements section. Scholarly tool requirements are described in the Education departmental section.

Master of Education

Licensed persons are eligible for this 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. Practicum experiences can be arranged for those students desiring direct involvement with children. The program culminates in a final paper, project, or thesis.

Master of Science

This degree is available in two tracks. Track I, either thesis or non-thesis, is open to licensed or non-licensed persons who wish to follow a research oriented program of study. Track I requires a minimum of five credits of scholarly tool coursework and allows a maximum two 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.

Sample Program of Study, M.Ed., Elementary

<table>
<thead>
<tr>
<th>Major</th>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 590</td>
<td>Writing in the Elementary School</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>T&amp;L 522</td>
<td>Mathematics in the Elementary School</td>
</tr>
<tr>
<td>T&amp;L 530</td>
<td>Foundations of Reading Instruction</td>
</tr>
<tr>
<td>Electives</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 569</td>
<td>Action Research</td>
</tr>
<tr>
<td>T&amp;L 995</td>
<td>Scholarly Project</td>
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<tr>
<td>or T&amp;L 997</td>
<td>Independent Study</td>
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Cognate

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<th>Major</th>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 524</td>
<td>Reading in the Content Areas</td>
</tr>
<tr>
<td>T&amp;L 534/583</td>
<td>Basic Reading Diagnosis &amp; Remediation/Clinic</td>
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Educational Foundations

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<tr>
<th>Major</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EFR 500</td>
<td>Foundations of Educational Thought</td>
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<tr>
<td>EFR 502</td>
<td>Issues and Trends in Education</td>
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Sample Program of Study, M.S., Elementary

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<th>Major</th>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 518</td>
<td>Science in the Elementary School</td>
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<tr>
<td>T&amp;L 519</td>
<td>Social Studies in the Elementary School</td>
</tr>
<tr>
<td>T&amp;L 522</td>
<td>Mathematics in the Elementary School</td>
</tr>
<tr>
<td>T&amp;L 530</td>
<td>Foundations of Reading Instruction</td>
</tr>
<tr>
<td>T&amp;L 590</td>
<td>Writing in the Elementary School</td>
</tr>
<tr>
<td>Electives (non-thesis)</td>
<td>7</td>
</tr>
<tr>
<td>Electives (thesis)</td>
<td>3-5</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>
<tr>
<td>(Track I or Track II)</td>
<td></td>
</tr>
<tr>
<td>or T&amp;L 998</td>
<td>Thesis (Track I only)</td>
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Scholarly Tools (Track I only)

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<th>Major</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EFR 509</td>
<td>Introduction to Educational Research</td>
</tr>
<tr>
<td>T&amp;L 569</td>
<td>Action Research</td>
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Educational Foundations (Track II, only)

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<tr>
<th>Major</th>
<th>Credits</th>
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<td>EFR 500</td>
<td>Foundations of Educational Thought</td>
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<tr>
<td>EFR 506</td>
<td>Multicultural Education</td>
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</table>

General Studies

Program Description

This M.S. degree program (thesis or non-thesis) is designed for both the licensed secondary teacher who seeks a major in education and a minor in another field, and those who wish to pursue a graduate degree in education that will inform broadly their own professional practice. This degree does not require, nor lead to, teacher licensure.

For licensed teachers the major portion of the program of study must include six credits in foundations, six credits in curriculum and six credits in scholarly tools. For those who are not licensed teachers, the major portion of the program of study must include nine credits in foundations, three credits in curriculum and six credits in scholarly tools. The program culminates in a final project/independent study or thesis.

The cognate for this degree should include academic coursework which provides broad support for the major. The minor must be obtained in a department that offers a graduate degree.

Admission Requirements

1. Teacher Licensure or
2. Minimum of 8 credit hours of social sciences/humanities

Degree Requirements (for licensed teachers)

1. Six (6) credits in foundations.
2. Six (6) credits in curriculum.
3. Six (6) credits in scholarly tools.
4. Nine (9) credits of cognate or minor

Degree Requirements (for those not licensed)

1. Nine (9) credits in foundations.
2. Three (3) credits in curriculum.
3. Six (6) credits in scholarly tools.

Reading Education

Program Description

These programs are designed for educators or other professionals interested in the study of individual readers and writers and reading/language arts curriculum and assessment. A unique feature of this program is that students become engaged in teaching literacy in a supervised practicum experience.

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.

Admission Requirements

1. For the M.Ed., teacher licensure at one of the following levels: early childhood, elementary, middle or secondary education.
2. For the M.S., licensure (early childhood, elementary, middle or secondary), or a baccalaureate degree in another field of study.

Refer to the Admissions section of the Graduate catalog for additional information on application procedures.

Degree Requirements

The M.Ed. degree in Reading Education requires coursework in the theoretical and practical aspects of teaching and learning language and literacy. It is designed to enable teachers to implement strong integrated language arts programs and to evaluate and improve pupil performance in reading/language arts. The program culminates in a
final project or thesis. With careful planning students can meet the course requirements for the North Dakota Reading Credential and be credentialed as reading teachers.

The M.S. degree in Reading Education 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 II requires a minimum of five credits of scholarly tool coursework and allows a maximum two credits of readings. 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.

Sample Program of Study, M.Ed., Reading

<table>
<thead>
<tr>
<th>Major</th>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 524 Reading in the Content Area</td>
<td>2</td>
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<tr>
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Special Education

Program Description

General Purpose

The focus of the program is the further preparation and certification of specialists in an area of special education. This involves the ability to diagnose children and young adult’s difficulties, plan curricular approaches, and develop and deliver instructional programs with the help of other pertinent professionals in the school.

Objectives

1. To introduce students to concepts, practices, and approaches that concern children with school-related difficulties.

2. To provide a practicum/internship setting that encourages students to both apply what they have learned and to further refine diagnostic and prescriptive skills with children and young adults in a specialist area, i.e., learning disabilities, emotional disturbance, developmental cognitive disabilities, early childhood special education, visual impairment, or cross-categorically, i.e., special education strategist.

3. To encourage within students an inquiring and questioning attitude toward their profession.

4. To encourage students to view their specialty within the broader context of the school setting. Included here would be a familiarization with issues, trends, and research that mark contemporary education.

5. To enable students to become conversant with literature of the field and to encourage them to be life-long learners.

Areas of Study Offered

A Master’s degree or credential* can be obtained in these areas:

- Special Education
- Special Education/Early Childhood
- Special Education/Cognitive/Developmental Disabilities
- Special Education/Emotional Disturbance
- Special Education/Learning Disabilities
- Special Education Strategist
- Special Education/Visual Impairment

Coursework in the area of gifted/talented is also available.

A certificate in Autistic Spectrum Disorders is also available. For additional information, please visit www.und.nodak.edu/org/grad/.

*Note that only students admitted to the master’s program in Special Education, or who have completed a master’s degree in Special Education at UND, are eligible to take advanced coursework in special education. Therefore, in order to complete the methods, assessment and internship required for credentials in Special Education, students must apply and be admitted to the master’s program in Special Education.

A student choosing to pursue a master’s degree in Special Education should not take more than nine semester credits before admission to the program. Only nine non-degree credits are eligible for application to a master’s program of study.

There are two types of degree programs available: The Master of Education and the Master of Science. The Master of Education degree is designed for certified teachers preparing to be teachers of students with disabilities. The Master of Science degree has two tracks. Track 1 is designed for students who wish to study and do research in the area of disabilities and is available to both certified and non-certified persons. Track 2 is intended for non-certified persons only and is designed for individuals working in related professions who wish to gain knowledge and skills in the area of disabilities in order to work with individuals with disabilities in non-educational settings.

Master of Education in Special Education

Prerequisites: Certification in Elementary, Middle or Secondary Education; Education of the Exceptional Student (T&L 315)

* Early Childhood and Secondary Education majors must complete coursework in elementary reading and math methods as prerequisites.
Major: Includes a minimum of 18 credits of Special Education coursework, plus two credits of T&L 995 or 997. Courses can be chosen from those listed on the advising handouts.

Cognate Area: At least six semester credits in a related area such as inclusive practices, reading, counseling, another disability area or administration.

Foundations of Education: Six semester credits with EFR 500, Foundations of Educational Thought (3 cr.) being required. The second EFR course can be chosen from those offered or approved by the Department of Educational Foundations and Research (EFR).

Master of Science in Special Education

Track #1

Prerequisites: Same as Master of Education requirements

Major: Same as Master of Education requirements

Scholarly Tool: At least five credits in Quantitative and/or Qualitative Methods

Minor or Cognate Option: If the minor/cognate option is selected, the 27-credit major is reduced by the number of credits in the minor or cognate.

Minor: An approved minor of at least ten credits from one department with a graduate program other than the Department of Teaching and Learning. Courses must be selected from those listed in the graduate catalog. The minor is signed by the chairperson of the minor department and will be listed as a minor on the transcript.

Cognate: At least nine credits in one area of concentration (other than Special Education) or in more than one area. (300-400 level courses in departments outside of the Department of Teaching and Learning which have graduate programs are acceptable). The cognate is not listed on the transcript.

Track #2

Intended for non-certified personnel only. This program is the same as Track #1 except that six credits of Foundations of Education are required, rather than five credits of Scholarly Tools.

Field Experience

There are three types of field experiences in the graduate program. For students seeking a teaching license, field experience is required. The Special Education Field Experience Request Form must be completed prior to enrollment in a field experience. Forms are available from the program area or the website. Please note that regardless of the internship option selected, each intern completes the same set of required, specialization-specific assignments. At the graduate level, field experience is completed in one of three ways:

- Traditional Internship
- On-the-Job Internship
- Resident Teacher Internship

Traditional Internship

This internship option leads to an initial special education credential that is added to a North Dakota license in early childhood, elementary, middle school, or secondary education.

On-the-Job Internship

This internship option is designed for our advanced special education graduate students, i.e., students with either undergraduate or graduate teaching licenses or credentials, respectively, in special education. These students are already special educators adding an additional specialization credential, i.e., LD, ED, DCD (MR), ECSE, or VI, to their special education teaching license. These students complete this internship in either fall or spring semesters while employed. A detailed plan must be submitted articulating how they will meet the internship requirements while working. This option requires an additional application to the program area faculty. The Criteria for On-the-Job Internships in Special Education Form is available from the program area or on the website.

 Resident Teacher Program

The Resident Teacher Program in Special Education provides a group of inexperienced teachers with support in entering the special education teaching profession. Resident teachers have an opportunity to earn a M.S. in Special Education through on-campus coursework and on-the-job field experience in a North Dakota school district.

Each resident teacher assumes full responsibility for a special education caseload and must be certified to teach in North Dakota. Resident teachers will earn stipends and a waiver of University tuition for a portion of work toward the master’s degree. (Residents are responsible for university fees each semester.) Resident teachers will enroll in graduate study during the summer prior to assuming teaching responsibilities.

Experienced resident mentors from the school district enhance the Resident Teacher Program. These mentors coach and provide support to the resident teachers and work with the University mentors. The resident mentors offer resident teachers consultation, demonstration teaching, feedback and support.

The University mentor represents the University of North Dakota’s interests in the Resident Teacher Program. This individual supervises the resident teachers and offers the resident mentors consultation and support.

To qualify as a resident teacher, the following conditions must be met:

1. Complete an undergraduate degree in Elementary, Middle Level or Secondary Education before residency begins.
2. Have a minimum overall GPA of 2.75, with preference given to those with a 3.00 GPA or better.
3. Submit an application by March 1 to Special Education, Department of Teaching and Learning, University of North Dakota, Box 7189, Grand Forks, ND 58202-7189 (available at: http://www.und.nodak.edu/dept/tl/specedu)
4. Apply for the M.S.in Special Education. Application is made to the Graduate School at the University of North Dakota (see admissions process below). This is a separate application from the one in #3 and requires a $35 application fee.
5. Be available for full-time graduate study during the summer session immediately preceding the residency.

Admissions Process for the Master’s Degree Program

Note: All students wishing to attain credentials in special education must apply to the master’s program.

The graduate application process consists of the following:

1. Application form
2. Application fee ($35)
3. Three letters of recommendation
4. Two official transcripts from each institution attended
5. Personal Statement

*Graduate program application procedures and forms can be found under “Graduate School Forms” on the UND web site at: graduateschool.und.edu.

Faculty | Office | Phone Number
--- | --- | ---
Dr. Katherine Anderson | Education 309 | 777-2863
Dr. Lynne Chalmers | Education 303A | 777-3187
Dr. Kari Chiasson | Education 303C | 777-3236
Dr. Patti Mahar | Education 303B | 777-6054
Teaching and Learning

Professors: Anderson, Baker, Barrentine, Chalmers, Chiasson, Combs, Gourneau, Guy, Helgeson, Holen, Ingwalson, Mahar, Olsen, Olson, Onchwar, Pearson, Smart, Tepper, Uhlenberg, Van Eck, Walker and Zidon

Doctoral Program

Program Description

The Ph.D. and 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. Three areas of emphasis are: Higher Education (preparation to be a college or university teacher of an academic discipline); Teacher Education (preparation to be an educator of teachers in a college or university setting and/or as a person providing consultation and inservice to teachers in pre-K-12 schools); and Research Methodologies (preparation of those who educate researchers in a college or university setting or who work as research consultants for agencies or schools).

Coursework for all areas of emphasis is offered by faculty from the departments of Teaching and Learning and Educational Foundations and Research. Faculty in both departments are able to serve as advisors to doctoral students. Students interested in Music Education should consult the Music section of this catalog.

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. Differences in the program of study structure of the two degrees reflect these differences in emphasis.

The doctoral student and advisory committee design the doctoral program of study to meet individual needs within the framework of guidelines set by the Graduate School and by the program faculty. Graduate School requirements for the Doctor of Philosophy (Ph.D.) and the Doctor of Education (Ed.D.) are stated in the Degree Requirement section.

Admission

Applicants are directed to consult the Teaching and Learning website for current admission deadlines and procedures.

Applicants should anticipate that the materials they submit will be held to high standards with the following basic expectations: Graduate grade point averages above 3.5; excellent writing skills; three references that speak to character, academic potential, and professional accomplishments; and clear goals that can be met by our program as specified in the Graduate Catalog.

Applicants interested in presenting a more complete picture of their strengths while entering a competitive field should submit additional evidence such as one of the following standardized test scores: The Advanced Graduate Record Examination, Miller Analogies Test, Graduate Record General Examination (verbal, quantitative, analytical).

Admission to the Ph.D. program in Teaching and Learning-Research Methodologies may occur after receipt of the bachelor’s degree.

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 a higher education option.

Degree Requirements

Doctor of Philosophy

The program of study shall include the following:

1. A major area which must be no less than half of the total number of hours for the degree. The major coursework includes a dissertation of at least 10 credit hours, a minimum of six credits in the Foundations of Education, and a minimum of 12 credits of scholarly tools. Scholarly tool options are described in the Education departmental requirements section.

2. A minor or cognate in a supporting area of at least 12 credit hours.

3. One of three residency options described in this departmental section.

Doctor of Education

The program of study shall include the following:

1. A major area consisting of a minimum of 58 credit hours in higher education, teacher education or research methodologies. Major coursework includes a dissertation of 10 credits, a minimum of 12 credits in the Foundations of Education, and a minimum of 6 credits of scholarly tools. Scholarly tool options for the doctoral students in education are described in the Education departmental requirements section of this catalog.

2. A minor or cognate in a supporting area of at least 12 credit hours.

3. One of the three following residency options.

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 Graduate School. 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 have 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 to include a minimum of two Doctoral Seminars during the period of residency.

Courses

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.

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.

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.

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, school-age academic children, multiply disabled children and adults).

504. Communication Media and Methods/Visually Impaired. 3 credits. Prerequisite: Consent of instructor. This course provides an overview of the communicative 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 in use in the field.

505. Low Vision Assessment and Remediation. 2 credits. Prerequisite: T&L 315 or consent of instructor. A course which focuses on children who have severe visual deficits but with proper training are able to utilize their vision for learning. Effects of low vision are studied with respect to psychological/sociological development, academic learning, skills of independent living, and vocational choice. Methods of assessing visual function are examined with emphasis on adaptations needed in the educational setting. Visual and non-optical aids are compared and evaluated.

506. Introduction to Emotional Disorders. 2 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 multi-systems approach.

507. Introduction to Developmental/Cognitive Disabilities. 2 credits. The historical perspective and the complexities of identification and characteristics of develop- mental/cognitive disabilities will be covered. Students will gain an understanding of service delivery models within a multi-systems approach.

508. Introduction to Learning Disabilities. 2 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.

510. Early Intervention for Children with Special Needs. 2 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, and educational and psychological effects of disabilities will be covered.

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.


514. Intervention Strategies with Infants and Toddlers. 2 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.

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.

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 fundamental formative years. The course looks at the philosophical aspects of curriculum and instructional. The studies explore contemporary issues associated with the middle school as well as the adaptations necessary for special circumstances affiliated with middle schools.

517. Creative Expression in the Elementary School. 2 credits. Content, methods, and theories in the field of writing instruction at the elementary school level.


520. Curriculum and Instruction in Elementary Schools. 4 credits. A study of processes for planning, implementing, and evaluating curriculum and improving instruction in elementary schools.


524. Reading in the Content Areas. 2 credits. Prerequisite: T&L 530. How and why reading should be taught in the content areas (i.e. Social Studies, Science, Math, etc.) Research studies in the field of content reading and a variety of instructional practices are reviewed.

526. Play in Development and Early Childhood Education. 2 credits. The play of children has long been viewed as essential to developmental processes. It is also the focus of the course. Education of the young child is concerned with the development of children. The course looks at the relationship of play to development (cognitive, physical and emotional), and the way in which play has been incorporated in programmatic settings.


528. Foundations of Reading Instruction. 3 credits. A study of developmental reading instruction. Emphasis is placed on the psycholinguistic process of teaching and learning, critiquing historical and current research, and the instructional approaches for teaching reading.

531. Teaching of Reading in the Primary Grades. 2 credits. Prerequisite: T&L 530. A study of the reading processes in the primary grades including essential factors of readiness for learning to read, teaching techniques, and approaches to beginning reading instruction.

532. Teaching of Reading in the Intermediate Grades. 2 credits. Prerequisite: T&L 530. A study of the reading processes in the intermediate grades with emphasis on learning and reading as a tool for learning.

533. Reading in the Secondary School. 2 credits. Prerequisite: T&L 530. Development of reading-study skills in the content subject areas and reading skill development.

534. Basic Reading Diagnosis and Remediation. 2 credits. Prerequisite: T&L 530 or consent of instructor. Focuses on common causes of reading disability, methods of diagnosis, and corrective reading programs in the classroom.

535. Advanced Reading/Language Arts Diagnosis and Remediation. 2 credits. Prerequisite: T&L 530 and 534. Analysis of interrelationships of learning difficulties in language arts areas and procedures for remediation.

536. Teaching and Supervision of Elementary Language Arts. 3 credits. Prerequisite: T&L 530. Consider the objectives of the elementary language arts program, methods of instruction, and recent curriculum trends. Recent research is read and critiqued.

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.

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.

540. Theories 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.

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.

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.

546. Young Children’s Thinking. 2 credits. Students in this course will study the thinking of young children, ages 4-8, through the lenses of a number of theoretical perspectives and through case studies of children. Developmental, cultural, personal, and gender similarities/differences in thinking will be examined.

549. Seminar. 1 to 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. May be repeated. S/U grading only.

551. Advanced Assessment/Special Needs Students. 3 credits. Prerequisite: T&L 421, 552 and 578. Theory and practice of assessment, including formal and informal procedures for screening, identification and assessment of learning disabled, emotionally disturbed and educable mentally retarded students. Practical assignments included.
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.

553. Collaborative Relationships: Home, School and Community. 3 credits. A course appropriate for anyone working with families, early childhood educators, general educators, specialists, educators, related service personnel, 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.

554. Advanced Methods: I.D. 3 credits. The study of specific strategies, methods, and materials for working with students with learning disabilities.

555. Advanced Methods: ED. 3 credits. The study of specific strategies, methods, and materials for working with students with emotional/behavioral disorders.

556. Advanced Methods: Developmental/Cognitive Disabilities. 3 credits. Prerequisites: Graduate Status. 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 cognitive disabilities.

557. Progress Monitoring/Special Needs Students. 2 credits. This course covers all aspects of progress monitoring including what it is, how it works, the benefits of progress monitoring, and various ways and strategies for conducting progress monitoring. Students will learn how to track student reading, math, and written language by creating data and then using that data to measure student progress in instructional decision-making. The strongest research-based strategy for progress monitoring, curriculum-based measurement, will be covered in depth.

560. Introduction to Autistic Spectrum Disorder. 2 credits. Prerequisites: Completion of a related field of study, e.g., education, special education, language pathologist, occupational therapy, physical therapy, social work, nursing, medicine, or seniors who have completed T&L 315. Education of the Exceptional Student, and are completing an undergraduate degree from a related field of study. 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, professional treatments, vocational training, related to the provision of quality life-long supports for these individuals.

561. Methods for Autistic Spectrum Disorder. 2 credits. Prereq: and corequisite: T&L 560. This is the second required course in a sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Its central purpose is to encourage caregivers and parents who work with persons with ASD to engage in reflective thinking about and critical analysis of the many and varied programs and methods commonly applied in practice with persons with ASD or frequently discussed in the professional literature base.

562. ASD: Supports Across the Lifespan. 2 credits. Prereq: and corequisites: T&L 560 and 561. This is the third required course in a sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Its central purpose is to examine the role of medicine and medically oriented interventions for persons with ASD. Included in the course are discussions of issues related to conducting wellness examinations with persons with ASD, medication treatments currently available and those that will become available in the future.

564. Structured Teaching. 2 credits. Prereq: and corequisites: T&L 560 and 561. This is an elective course in the sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Its central purpose is to examine the role of medicine and medically oriented interventions for persons with ASD. Included in the course are discussions of issues related to conducting wellness examinations with persons with ASD, medication treatments currently available and those that will become available in the future.

565. Methods for Students with Asperger Syndrome. 2 credits. Prereq: and corequisites: T&L 560 and 561. This is an elective course in the sequence of interdisciplinary courses focusing on autistic spectrum disorder (ASD). Its central purpose is to examine the role of medicine and medically oriented interventions for persons with ASD. Included in the course are discussions of issues related to conducting wellness examinations with persons with ASD, medication treatments currently available and those that will become available in the future.

567. Action Research. 3 credits. Prerequisite: graduate status. 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.

570. History of Higher Education in the U.S. 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.

571. Teacher Education: Focus on the Teacher. 3 credits. Practices, issues, and trends in the design and implementation and assessment of programs for the preparation and development of K-12 teachers.

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 special needs students. Topics include procedures to increase self-awareness, self-management, self-control, self-reliance, self-esteem, and assessment procedures and techniques for determining behavioral needs.

580. Practicum in Schools. 1 to 4 credits. Prerequisites: Appropriate foundational coursework, area courses, and consent of the instructor and advisor. Practicum in study of desirable school practices, observations in nearby schools, and application of research findings in solving practical problems. May be repeated.

581. Resident Internship. 4 credits each. Prerequisites: participation in the summer program prior to the internship and elementary teacher certification. 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.

583. Reading Clinic. 1 to 4 credits. Prerequisite: TL 530 or consent of instructor. Supervised clinical practice in diagnosis of reading difficulties, report writing, and tutoring. Includes school observations.

584. Internship in Education. 1 to 8 credits. Prerequisites: Appropriate foundational, cognitive, and major area coursework and consent of the advisor and instructor. 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. May be repeated.

585. 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 role of the scholarly publishing process. May be repeated.

586. Assessment in Higher Education. 3 credits. This course provides an understanding of the various aspects of assessment—course, program, and institutional—that is crucial in ensuring that beliefs held by academicians support the stated goals, expectations, and standards identified by its faculty and administration.

587. 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.

591. Readings in Education. 1 to 4 credits. Prerequisites: Consent of advisor and instructor. Designed primarily for advanced graduate students. May be repeated for different topics.

593. Independent Projects. 1-4 credits.

595. Advanced Methods: E.D. 3 credits. This course 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. May be repeated.

599. Scholarly Project. 2 credits. The scholarly project demonstrates critical analytical and application of information and experiences gained through the study of program. The project allows students to demonstrate critical 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.

421. Transition to Adult Life. 3 credits.

422. Education of Gifted and Talented. 2 credits.

423. Assessment Program Planning/Special Needs Students. 3 credits.

453. Organization, Administration, and Supervision in Early Childhood Education. 2 credits.

455. Comparative Approaches to the Education of Young Children. 3 credits.

493. Problems in Special Education. 2 to 5 credits.

Electrical Engineering

Professors: Bigelow, Faruque, Kaabouch, Miles, Salehfar, and Schultz (Chair)

Program Description

The Department of Electrical Engineering offers graduate programs leading to the Master of Engineering (M.Eng.) and the Master of Science (M.S.) degree. The department maintains strong research emphases in systems engineering, controls, power systems, wireless telecommunication systems, and applied electromagnetics. The M.S. degree is offered under both the thesis and non-thesis options. The Master of Science in Electrical Engineering program and the school-wide Engineering Ph.D. program. The research
programs, laboratory facilities, close student-faculty interaction, and strong academic advising facilitate an excellent environment of scholarly activity and provide the faculty and graduate students with the knowledge, aptitudes, and attitudes which prepare them for corporate and government positions and for further opportunities in research and development.

The department offers combined Bachelor of Science in Electrical Engineering (BSEE)/Master of Science (with a major in Electrical Engineering) and BSEE/Master of Engineering (MEngr) degree programs. The intention 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. See Combined Degree Program under the School of Engineering and Mines section for additional details.

Admission Requirements

Master of Science

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 deficiencies 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.

Master of Engineering

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 deficiencies in electrical engineering have been satisfied.
2. An overall undergraduate GPA of at least 2.75 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.

Combined Program

Admission to the Combined Program, either BSEE/MS or BSEE/ MEngr, requires an overall undergraduate GPA of at least 3.0 at the time of admission.

Degree Requirements

There are no specific departmental degree requirements beyond those required for the Master of Science or Master of Engineering degrees.

Courses

503. Statistical Communications Theory and Signal Processing I. 3 credits. Prerequisite: EE 411 or consent of instructor. Theory of time series analysis of random signals as applied to signal processing is emphasized.

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.

505. Control Systems II. 3 credits. Prerequisite: EE 405. Advanced topics in control systems including nonlinear systems, robust control, optimal control, and pole placement techniques; selective topics from the state of the art.

506. Digital Control Systems. 3 credits. Prerequisite: Electrical Engineering 405. Digital systems representation, analysis and simulation; Z-transform; digital controllers design and realization; microprocessor based controllers.

507. Spacecraft Systems Engineering. 3 credits. Space environment, dynamics of spacecraft, celestial mechanics, mission planning, and systems engineering methodology.

508. Decision Systems. 3 credits. Prerequisite: EE 314. Systems and networks will be designed to work in an uncertain environment. Systems will be optimized using Neural Networks and Fuzzy Logic concepts.

509. Signal Integrity. 3 credits. Prerequisite: EE 409 or consent of instructor. Fundamental concepts of signal integrity are presented. Topics include propagation of digital signals, electrical noise, and system timing.

511. Industrial Electronics. 3 credits. Prerequisite: EE 321. Application methods and problems of electronic circuits in the manufacturing and power industries.

512. Wireless Communications. 3 credits. Prerequisite: EE 411 or consent of instructor. Key concepts, underlying principles, and practical applications of ever-growing wireless and cellular communication technologies.

519. Digital Computer Logic. 3 credits. Prerequisite: EE 451 or consent of instructor. Logic design analysis of digital computers with some applications.

520. Electronic Computing Systems. 3 credits. Prerequisites: EE 201 and EE 421. Design of bit slice computers; simulation of computers’ special purpose controller design; advanced microprocessor design and use.

521. Discrete Real Time Filtering. 3 credits. Prerequisite: EE 314. Modern methods of high speed digital signal processing will be studied. Techniques which will be used include the recursive and nonrecursive discrete-time filters and the Fast Fourier Transform. The digital computer will be used to implement these filters.

522. Renewable Energy Systems. 3 credits. Prerequisite: Graduate and Senior Engineering students. 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.

523. Power Systems II. 3 credits. Prerequisite: EE 423. Electric power systems analysis and control. Power flow; system response and stability; voltage and frequency control; computer methods in system analysis.

525. Electromagnetic Fields. 3 credits. Prerequisite: EE 316. Static electric and magnetic fields, field mapping, and applications to transmission lines, wave guides, and antennas.

532. Antenna Theory. 3 credits. Prerequisite: EE 316 or consent of instructor. Physical principles underlying antenna behavior and design as applied to antennas.

536. Optical Fiber Communications. 3 credits. Prerequisite: EE 434 or consent of instructor. Propagation in optical fibers, optical receivers, amplifiers, detectors, sources, transmission links, noise consideration, optical fiber communication systems, applications and future developments.

537. Graduate Cooperative Education. 3 credits. Prerequisites: Approved status, 3.00 GPA, completed a minimum of 9 credits of the program of study, and approval of the department. 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.

539. Electromagnetic Compatibility. 3 credits. Prerequisite: EE 409 or consent of instructor. Introduction to design considerations and techniques used to ensure electromagnetic compatibility.

540. Biomedical Instrumentation. 3 credits. Prerequisites: EE 314, EE 316, EE 421 or consent of instructor. Introduction to circuits and systems that allow electrical technology to interface with biological systems.

570. Seminar. 1 credit. Open to qualified advanced undergraduate students and graduates.

590. Advanced Electrical Engineering Problems. Credit to be arranged. Open by permission to graduate students and qualified seniors. Students work under the supervision of a member of the staff. A written report is required.

595. Design Project. 3 to 6 credits. Prerequisite: Restricted to the Master of Engineering student candidate and subject to approval by the student’s advisor. A three to six credit course of engineering design experience involving individual effort and a formal written report. S/U grading only.

997. Independent Study or Final Project. 2 credits.

998. Thesis. 4-6 credits.

411. Communications Engineering. 3 credits.

423. Power Systems I. 3 credits.

428. Robotics Fundamentals. 3 credits.

430. Radiating Systems. 3 credits.

434. Microwave Engineering. 3 credits.

451. Computer Hardware Organization. 3 credits.

456. Digital Image Processing. 3 credits.

Elementary Education

(See Education: Elementary Education)

Engineering

Hossein Salehfar (Program Director)

Program Description

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: Chemical Engineering, Civil Engineering, Electrical Engineering, Energy Engineering, Environmental Engineering, Geological Engineering, or Mechanical Engineering.

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.

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.

Specific research interests of the faculty can be found through the School of Engineering and Mines web page at: www.und.nodak.edu/dept/sem, or by consulting the director of the engineering doctoral program.

**Track Coordinators**

Chemical Engineering: Chemical Engineering Ph.D. Graduate Director
Civil Engineering: Civil Engineering Ph.D. Graduate Director
Electrical Engineering: Electrical Engineering Ph.D. Graduate Director
Energy Engineering: Engineering Ph.D. Program Director
Environmental Engineering: Environmental Engineering Graduate Director
Geological Engineering: Geological Engineering Ph.D. Graduate Director
Mechanical Engineering: Mechanical Engineering Ph.D. Graduate Director

**Admission Requirements**

1. Direct approved admission status to the Doctoral Program in Engineering requires 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 or higher.
2. A minimum composite score of 550 on the paper-based or 85 on the Internet-based TOEFL for international students whose native language is not English is required for direct approved admission status to the Doctoral Program.

3. In addition to meeting the general provisions in the UND graduate catalog and the minimum requirements in items 1-2 above, candidates are assessed using a holistic process that considers GRE test scores (students with a B.S. engineering degree from an ABET accredited program are not required to submit GRE scores), 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 School 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, fellowships, 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 to be given full consideration for financial aid. Assistantships are renewable if progress toward the degree and instructional/research service are satisfactory.

**Degree Requirements**

The following requirements are in addition to the UND graduate school general requirements for the Ph.D.

1. 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.
2. Of the 90 credit hours required for a Ph.D., a maximum of 30 credit hours can be transferred from a master’s program.
3. Of the 90 credit hours required for a Ph.D., a minimum of 30 credit hours must be doctoral research and dissertation.
4. Of the 90 credit hours required for a Ph.D., exactly 3 credit hours must be Engr 562: Engineering Seminar.
5. Of the 90 credit hours required for a Ph.D., 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 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 coursework may be transferred from a master’s program.
6. 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.
7. An oral comprehensive examination is completed when at least 30 credits of post baccalaureate coursework has been completed. This examination will be based significantly on the core of the individual’s program of study including work in the minor field of study, but may also include questions related to other track-specific Engineering fundamentals. The examination will be administered by three faculty members from the program of the student’s track. Three results of the examination can be obtained: 1) pass; 2) provisional pass; and 3) fail. Candidates obtaining a result of “provisional pass” will be allowed to Advance to Candidacy status after completion of stipulations specified by the examining committee plus obtaining a passing result on a retest for the portion of the exam covered by the stipulations. Candidates who fail the exam, will be allowed one opportunity to repeat the exam. The reexamination must take place no later than 13 months after the initial examination attempt.
8. Students must present to their advisory committee an annual oral progress report describing research progress. One of these presentations will include a detailed presentation of the dissertation research plan. This presentation must be completed at least one year prior to the expected completion of the Ph.D. requirements. These presentations may be made as a partial fulfillment of the students Engineering Seminar (Engr 562) requirements with approval of the student’s advisory committee.
9. A candidate for the degree must complete an original basic research investigation. Each candidate will complete the research investigation to the satisfaction of the research adviser and the advisory committee and will prepare a dissertation covering the research. The project must represent an original and independent investigation by the student. It is normally expected that the results of the research will be submitted for publication in refereed research journals. The candidate will present and successfully defend the dissertation at the final examination (see graduate school requirements).

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.

General Courses

Courses accepted for this degree are listed under each individual track. Please refer to the home departments for a course description. The courses listed below are administered by the Director of the Engineering Program.

501. Energy, Resource and Policy. 3 Credits. Prerequisite: Consent of instructor. Structured discussions of energy, resources and policy issues, related to energy security and national and global well being, based on selected readings.
502. Alternative Energy Systems. 3 credits. Prerequisite: Consent of instructor. 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.
562. Seminar in Engineering. 1 credit. Prerequisites: admission to the Energy Ph.D. program. Conference and reports on current developments in Engineering
590. Special Topics in Engineering. 1 to 6 credits. Prerequisites: consent of instructor. Investigations of special topics in energy engineering dictated by students and faculty interests.
599. Doctoral Research. 1 to 15 credits repeatable to 60.
999. Dissertation. 1 to 18 credits.

Course List for Chemical Engineering Track

Chemical Engineering Department Graduate Courses:

* ChE501. Advanced Transport Phenomena. 3 credits.
* ChE 503. Fuels Technology. 3 credits.
* ChE504. Air Pollution Control. 3 credits.
* ChE509. Advanced Chemical Engineering Thermodynamics. 3 credits
* ChE 510. Advanced Process Control. 3 credits
* ChE 511. Advanced Chemical Engineering Kinetics. 3 credits.
* ChE 512. Advanced Separation. 3 credits.
* ChE 515. Design of Experiments. 3 credits.
* ChE 535. Metallic Corrosion and Polymer Degradation. 3 credits.
* ChE 593A. Polymer Science and Engineering. 3 credits.

* Student must take these four core courses
Course List for Civil Engineering Track

Civil Engineering Department Graduate Courses:

* CIEN 502. Structural Stability. 3 credits.
* CIEN 503. Structural Dynamics. 3 credits.
* CIEN 523. Applied Hydraulics. 3 credits.
** CIEN 524. Open Channel Hydraulics. 3 credits.
** CIEN 531. Environmental Engineering III. 3 credits.
** CIEN 532. Environmental Engineering IV. 3 credits.
** CIEN 533. Industrial Waste Management. 3 credits.
** CIEN 535. Hazardous Waste Management. 3 credits.
* CIEN 551. Plate and Slab Structures. 3 credits.
* CIEN 552. Thin Shell Structures. 3 credits.
* CIEN 555. Prestressed Concrete Analysis and Design. 3 credits.
* CIEN 556. Numerical and Matrix Methods of Structural Analysis. 3 credits.

Other Acceptable Departmental Courses:

Environmental & Ecology Related Courses:

AtSe 505. Advanced Atmospheric Dynamics. 3 credits.
AtSe 510. General Circulation. 3 credits.
AtSe 515. Advanced Climatology. 3 credits.
AtSe 520. Atmospheric Chemistry. 3 credits.
AtSe 525. Atmospheric Radiation. 3 credits.
AtSe 528. Atmospheric Data Analysis. 3 credits.
AtSe 530. Numerical Weather Prediction. 3 credits.
AtSe 535. Measurement Systems. 3 credits.
AtSe 540. Statistical Methods in Atmospheric Science. 3 credits.
AtSe 545. Hydrometeorology. 3 credits.
Avit 512. Aviation Environmental Concerns. 3 credits.
Biol 533. Grassland Ecology. 2 credits.
Biol 540. Waterfowl Biology and Management. 2 credits.
CIEL 531. Environmental Engineering III. 3 credits.
CIEL 532. Environmental Engineering IV. 3 credits.
CIEL 533. Hazardous Waste Management. 3 credits.
Engr 501. Energy, Resources and Policy. 3 credits.
ESSP 506. Ecosystem Services. 3 credits.
ESSP 520. Earth Systems Modeling. 3 credits.
ESSP 540. Advanced Topics in Geospatial Technology. 3 credits.
ESSP 562. Environmental Economics. 3 credits.
GeoE 417. Hydrogeology. 3 credits.
GeoE 419. Groundwater Monitoring. 3 credits.
GeoE 427. Groundwater Monitoring. 3 credits.
Geol 500. Sedimentary Geology. 1-4 credits.
Geol 505. Isotopic Geology. 3 credits.
Geol 509. Advanced Mineralogy. 1-4 credits.
Geol 530. Advanced Hydrogeochemistry. 3 credits.
Geol 531. Hydrogeology. 3 credits.
Geol 532. Contaminant Hydrogeology. 3 credits.
Geol 540. Water Sampling & Analysis. 3 credits.
Split 501. Survey of Space Studies. 3 credits.
Split 520. Asteroids. 3 credits.
Biochemical Related Courses:

BIMD 500. Cell Molecular Foundations of Biomedical Science. 7 credits.
BIMD 512. Biomedical Statistics. 2 credits.
BIMD 531. Advanced Molecular Biology I. 3 credits.
BIMD 532. Advanced Molecular Biology II. 3 credits.
Biol 542. Comparative Endocrinology. 3 credits.
Biol 551. Biochemical Genetics. 3 credits.
Biol 554. Cyto genetics. 2 credits.
Biol 564. Developmental Morphology of Plants. 2 credits.
Business/Management/Economics Related Courses:

Econ 505. Advanced Macroeconomic Theory. 3 credits.
Econ 509. Macroeconomic Decision-Making. 3 credits.
Econ 514. Advanced Managerial Economics. 3 credits.
Automation and Process Control Related Courses:

Acct 510. Industrial Quantitative Controls. 3 credits.
Mgmt 501. Quantitative Analysis for Management Decisions. 3 credits.
EE 503. Statistical Communications and Signal Processing I. 3 credits.
EE 504. Statistical Communications and Signal Processing II. 3 credits.
EE 505. Control Systems II. 3 credits.
EE 506. Digital Control Systems. 3 credits.
EE 508. Decision Systems. 3 credits.
Geog 574. Advanced Techniques in Geographical Info. Systems. 3 credits.
Geog 575. Seminar in Remote Sensing. 3 credits.
Miscellaneous Courses:

Comm 512. Law and Ethics in Communications. 3 credits.
Comm 530. Gender, Culture, and Communications. 3 credits.
Split 525. Technical Issues in Space. 3 credits.
IT 560. Qualitative Planning and Analysis. 3 credits.
IT 565. Product Safety and Liability. 3 credits.
Biol 542. Comparative Endocrinology. 3 credits.
Biol 551. Biochemical Genetics. 3 credits.
Biol 554. Cytogenetics. 2 credits.
Biol 564. Developmental Morphology of Plants. 2 credits.

Business/Management/Economics Related Courses:
Econ 505. Advanced Macroeconomic Theory. 3 credits.
Econ 509. Macroeconomic Decision-Making. 3 credits.
Econ 514. Advanced Managerial Economics. 3 credits.

Automation and Process Control Related Courses:
Acct 510. Industrial Quantitative Controls. 3 credits.
Mgmt 501. Quantitative Analysis for Management Decisions. 3 credits.
EE 503. Statistical Communications and Signal Processing I. 3 credits.
EE 504. Statistical Communications and Signal Processing II. 3 credits.
EE 505. Control Systems I. 3 credits.
EE 506. Control Systems II. 3 credits.
EE 507. Spacecraft Systems Engineering. 3 credits.
EE 508. Decision Systems. 3 credits.
EE 509. Signal Integrity. 3 credits.
EE 511. Industrial (Power) Electronics. 3 credits.
EE 519. Digital Computer Logic. 3 credits.
EE 520. Electronic Computing Systems. 3 credits.
EE 521. Discrete Real Time Filtering. 3 credits.
EE 522. Renewable Energy System. 3 credits.
EE 523. Power Systems I. 3 credits.
EE 525. Electromagnetic Fields. 3 credits.
EE 532. Antenna Theory. 3 credits.
EE 536. Optical Fiber Communications. 3 credits.
EE 590. Avionics. 3 credits.
EE 590. Biomedical Engineering. 3 credits.
EE 590. Advanced Electrical Engineering Problems. 3 credits.
EE 590. Electromechanical Devices and Systems. 3 credits.
EE 590. ASIC Design. 3 credits.
EE 590. Wireless Communication. 3 credits.

Course List for Electrical Engineering Track
EE 503. Statistical Communications Theory & Signal Processing I. 3 credits.
EE 504. Statistical Communications Theory & Signal Processing II. 3 credits.
EE 505. Control Systems I. 3 credits.
EE 506. Digital Control Systems. 3 credits.
EE 507. Spacecraft Systems Engineering. 3 credits.
EE 508. Decision Systems. 3 credits.
EE 509. Signal Integrity. 3 credits.
EE 511. Industrial (Power) Electronics. 3 credits.
EE 519. Digital Computer Logic. 3 credits.
EE 520. Electronic Computing Systems. 3 credits.
EE 521. Discrete Real Time Filtering. 3 credits.
EE 522. Renewable Energy System. 3 credits.
EE 523. Power Systems I. 3 credits.
EE 525. Electromagnetic Fields. 3 credits.
EE 532. Antenna Theory. 3 credits.
EE 536. Optical Fiber Communications. 3 credits.
EE 590. Avionics. 3 credits.
EE 590. Biomedical Engineering. 3 credits.
EE 590. Advanced Electrical Engineering Problems. 3 credits.
EE 590. Electromechanical Devices and Systems. 3 credits.
EE 590. ASIC Design. 3 credits.
EE 590. Wireless Communication. 3 credits.

The following undergraduate courses also have graduate standing and may be used for graduate credit:
EE 411. Communications Engineering. 3 credits.
EE 423. Power Systems I. 3 credits.
EE 428. Robotics Fundamentals. 3 credits.
EE 430. Radiating Systems. 3 credits.
EE 454. Microwave Engineering. 3 credits.
EE 451. Computer Hardware Organization. 3 credits.
EE 456. Digital Image Processing. 3 credits.
EE 490. Avionics. 3 credits.
EE 490. Biomedical Engineering. 3 credits.
EE 490. Renewable Energy Systems. 3 credits.
EE 490. Wireless Communication. 3 credits.
EE 490. ASIC Design. 3 credits.

All Chemical Engineering Graduate Courses
All Chemistry Graduate Courses
All Civil Engineering Graduate Courses
All Mathematics Graduate Courses
All Mechanical Engineering Graduate Courses
All Physics Graduate Courses
All Computer Science Graduate Courses

Other Acceptable Departmental Courses:

Environmental & Ecology Related Courses:
AtSc 505. Advanced Atmospheric Dynamics. 3 credits.
AtSc 510. General Circulation. 3 credits.
AtSc 515. Advanced Climatology. 3 credits.
AtSc 520. Atmospheric Chemistry. 3 credits.
AtSc 525. Atmospheric Radiation. 3 credits.
AtSc 528. Atmospheric Data Analysis. 3 credits.
AtSc 530. Numerical Weather Prediction. 3 credits.
AtSc 535. Measurement Systems. 3 credits.
AtSc 540. Statistical Methods in Atmospheric Science. 3 credits.

AtSc 545. Hydrometeorology. 3 credits.
Avl 512. Aviation Environmental Concerns. 3 credits.
Biol 533. Grassland Ecology. 2 credits.
Biol 546. Waterfowl Biology and Management. 2 credits.
CIEN 531. Environmental Engineering III. 3 credits.
CIEN 532. Environmental Engineering IV. 3 credits.
CIEN 533. Industrial Wastes. 3 credits.
CIEN 535. Hazardous Waste Management. 3 credits.
Engr 501. Energy, Resources and Policy. 3 credits.
ESSP 506. Ecosystems Services. 3 credits.
ESSP 520. Earth Systems Modeling. 3 credits.
ESSP 540. Advanced Topics in Geospatial Technology. 3 credits.
ESSP 562. Environmental Economics. 3 credits.
Geol 417. Hydrogeology. 3 credits.
Geol 419. Groundwater Monitoring. 3 credits.
Geol 427. Groundwater Modeling. 3 credits.
Geol 508. Sedimentary Geology. 1-4 credits.
Geol 509. Isotopic Geology. 3 credits.
Geol 599. Advanced Mineralogy. 1-4 credits.
Geol 530. Advanced Hydrogeochemistry. 3 credits.
Geol 531. Hydrogeochemistry. 3 credits.
Geol 532. Contaminant Hydrogeology. 3 credits.
Geol 540. Water Sampling & Analysis. 3 credits.
SpSt 501. Survey of Space Studies. 3 credits.
SpSt 520. Asteroids. 3 credits.

Biochemical Related Courses:
BIMD 500. Cell Molecular Foundations of Biomedical Science. 7 credits.
BIMD 512. Biomedical Statistics. 2 credits.
BIMD 531. Advanced Molecular Biology I. 3 credits.
BIMD 532. Advanced Molecular Biology II. 3 credits.
Biol 542. Comparative Endocrinology. 3 credits.
Biol 551. Biochemical Genetics. 3 credits.
Biol 554. Cytogenetics. 2 credits.
Biol 564. Developmental Morphology of Plants. 2 credits.

Business/Management/Economics Related Courses:
Econ 505. Advanced Macroeconomic Theory. 3 credits.
Econ 509. Macroeconomic Decision-Making. 3 credits.
Econ 514. Advanced Managerial Economics. 3 credits.

Automation and Process Control Related Courses:
Acct 510. Industrial Quantitative Controls. 3 credits.
Mgmt 501. Quantitative Analysis for Management Decisions. 3 credits.
EE 503. Statistical Communications and Signal Processing I. 3 credits.
EE 504. Statistical Communications and Signal Processing II. 3 credits.
EE 505. Control Systems I. 3 credits.
EE 506. Digital Control Systems. 3 credits.
EE 507. Spacecraft Systems Engineering. 3 credits.
EE 508. Decision Systems. 3 credits.
EE 509. Signal Integrity. 3 credits.
EE 511. Industrial (Power) Electronics. 3 credits.
EE 519. Digital Computer Logic. 3 credits.
EE 520. Electronic Computing Systems. 3 credits.
EE 521. Discrete Real Time Filtering. 3 credits.
EE 522. Renewable Energy System. 3 credits.
EE 523. Power Systems I. 3 credits.
EE 525. Electromagnetic Fields. 3 credits.
EE 532. Antenna Theory. 3 credits.
EE 536. Optical Fiber Communications. 3 credits.
EE 590. Avionics. 3 credits.
EE 590. Biomedical Engineering. 3 credits.
EE 590. Advanced Electrical Engineering Problems. 3 credits.
EE 590. Electromechanical Devices and Systems. 3 credits.
EE 590. ASIC Design. 3 credits.
EE 590. Wireless Communication. 3 credits.

Miscellaneous Courses:
Comm 512. Law and Ethics in Communications. 3 credits.
Comm 530. Gender, Culture, and Communications. 3 credits.
SpSt 525. Technical Issues in Space. 3 credits.
IT 560. Qualitative Planning and Analysis. 3 credits.
IT 565. Product Safety and Liability. 3 credits.

Course List for Energy Engineering Track

Energy Related Engineering Courses:
Chem 503. Fuels Technology. 3 credits.
Chem 504. Air Pollution Control. 3 credits.
Chem 509. Advanced Chemical Engineering Thermodynamics. 3 credits.
Chem 535. Metallic Corrosion and Polymeric Degradation. 3 credits.
Chem 510. Intermediate Inorganic Chemistry. 3 credits.
Chem 511. Advanced Inorganic Chemistry. 3 credits.
Chem 542. Electrochemical Methods. 3 credits.
CIEN 531. Environmental Engineering III. 3 credits.
CIEN 532. Environmental Engineering IV. 3 credits.
CIEN 533. Industrial Wastes. 3 credits.
CIEN 535. Hazardous Waste Management. 3 credits.
Engr 501. Energy, Resources and Policy. 3 credits.
EE 423. Power Systems I. 3 credits.
EE 522. Renewable Energy Systems. 3 credits.
EE 523. Power Systems II. 3 credits.
Geol 417. Hydrogeology. 3 credits.
Geol 419. Groundwater Monitoring. 3 credits.
Geol 427. Groundwater Modeling. 3 credits.
SpSt 525. Technical Issues in Space. 3 credits.
IT 560. Qualitative Planning and Analysis. 3 credits.
IT 565. Product Safety and Liability. 3 credits.
Course List for Environmental Engineering Track

Environmental Related Engineering Courses:

- ChE 501. Advanced Transport Phenomena. 3 credits.
- ChE 504. Air Pollution Control. 3 credits.
- ChE 507. Advanced Unit Operations. 3 credits.
- ChE 509. Advanced Chemical Engineering Thermodynamics. 3 credits.
- ChE 510. Advanced Chemical Process Control. 3 credits.
- ChE 511. Advanced Chemical Engineering Kinetics. 3 credits.
- ChE 512. Advanced Separation Processes. 3 credits.
- ChE 515. Design of Engineering Experiments. 3 credits.
- CIEN 531. Environmental Engineering III. 3 credits.
- CIEN 532. Environmental Engineering IV. 3 credits.
- CIEN 533. Industrial Wastes. 3 credits.
- CIEN 535. Hazardous Waste Management. 3 credits.
- Engr 501. Energy, Resources and Policy. 3 credits.
- Geoe 417. Hydrogeology. 3 credits.
- Geoe 419. Groundwater Monitoring. 3 credits.
- Geoe 427. Groundwater Modeling. 3 credits.
- Geoe 506. Sedimentary Geology. 3 credits.
- Geoe 505. Isotope Geology. 3 credits.
- Geoe 509. Advanced Mineralogy. 3 credits.
- Geoe 530. Advanced Physical Hydrogeology. 3 credits.
- Geoe 551. Hydrochemistry. 3 credits.
- Geoe 532. Contaminant Hydrogeology. 3 credits.
- Geoe 540. Water Sampling & Analysis. 3 credits.

*All students must take at least one of the following ChE courses (ChE 501, ChE 504, or ChE 512), at least one of the following Civil Engineering courses (CIEN 531, CIEN 532, CIEN 533), and at least one of the following Geological Engineering courses (Geoe 417 or Geoe 540).

Other Acceptable Departmental Courses:

All Other Chemical Engineering Graduate Courses
All Other Civil Engineering Graduate Courses
All Other Electrical Engineering Graduate Courses
All Other Geology and Geological Engineering Graduate Courses
All Other Mechanical Engineering Graduate Courses
All Chemistry Graduate Courses
All Mathematics Graduate Courses
All Physics Graduate Courses
All Computer Science Graduate Courses

Environmental & Ecology Related Courses:
- AtSc 505. Advanced Atmospheric Dynamics. 3 credits.
- AtSc 510. General Circulation. 3 credits.
- AtSc 515. Advanced Climatology. 3 credits.
- AtSc 520. Atmospheric Chemistry. 3 credits.
- AtSc 525. Atmospheric Radiation. 3 credits.
- AtSc 528. Atmospheric Data Analysis. 3 credits.
- AtSc 530. Numerical Weather Prediction. 3 credits.
- AtSc 535. Measurement Systems. 3 credits.
- AtSc 540. Statistical Methods in Atmospheric Science. 3 credits.
- AtSc 545. Hydrometeorology. 3 credits.
- Avit 512. Aviation Environmental Concerns. 3 credits.
- Bird 533. Grassland Ecology. 2 credits.
- Bird 534. Quantitative Ecology. 2 credits.
- Bird 540. Waterfowl Biology and Management. 2 credits.
- ESSP 506. Ecosystem Services. 3 credits.
- ESSP 520. Earth Systems Modeling. 3 credits.
- ESSP 540. Advanced Topics in Geospatial Technology. 3 credits.
- ESSP 562. Environmental Economics. 3 credits.
- Split 501. Survey of Space Studies. 3 credits.
- Split 520. Asteroids. 3 credits.

Business/Management/Economics Related Courses:
- Econ 505. Advanced Macroeconomic Theory. 3 credits.
- Econ 509. Macroeconomic Decision-Making. 3 credits.
- Econ 511. Advanced Business and Economic Forecasting. 3 credits.
- Econ 516. Advanced Managerial Economics. 3 credits.
- Econ 524. Applied Economic Analysis I. 3 credits.
- Econ 530. Seminar in International Economics. 3 credits.
- Econ 534. Applied Economic Analysis II. 3 credits.
- Econ 550. Economics of Regulation. 3 credits.
- Econ 580. Economic Development. 3 credits.
- Fin 501. Managerial Finance. 3 credits.
- Pols 501. Political and Public Policy Analysis. 3 credits.
- Pols 502. Seminar: Problems in State and Local Governments. 3 credits.
- Pols 503. Seminar: Public Administration. 3 credits.
- Pols 532. Public Policy. 3 credits.
- Pols 533. Administrative Ethics in the Public Sector. 3 credits.
- Soc 407. Political Sociology. 3 credits.

Automation and Process Control Related Courses:
- Acct 510. Industrial Quantitative Controls. 3 credits.
- Mgmt 501. Quantitative Analysis for Management Decisions. 3 credits.
- Geoe 574. Advanced Techniques in Geographical Info. Systems. 3 credits.
- Geoe 575. Seminar in Remote Sensing. 3 credits.

Miscellaneous Courses:
- Comm 507. Communication, Technology, and Media. 3 credits.
- Comm 509. Media and Cultural Communication. 3 credits.
- Comm 512. Law and Ethics in Communications. 3 credits.
- Comm 530. Gender, Culture, and Communications. 3 credits.
- Split 525. Technical Issues in Space. 3 credits.
- IT 560. Qualitative Planning and Analysis. 3 credits.
- IT 565. Product Safety and Liability. 3 credits.
- Soc 435. Racial and Ethnic Relations. 3 credits.
Course List for Geological Engineering Track

Geology / Geological Engineering Department Graduate Courses:

- GeoE 500. Sedimentary Geology. 1-4 credits.
- GeoE 505. Isotope Geochemistry. 3 credits.
- GeoE 506. Glacial Geology. 4 credits.
- GeoE 509. Advanced Mineralogy. 1-4 credits.
- GeoE 511. Advanced Structural Geology. 4 credits.
- GeoE 512. Advanced Petrology. 1-4 credits.
- GeoE 518. Topics in Advanced Stratigraphy. 2-4 credits.
- GeoE 520. Statistical Applications in Geology. 3 credits.
- GeoE 522. History and Philosophy of Geology. 3 credits.
- GeoE 523. Topics in Advanced Geomorphology. 1-4 credits.
- GeoE 525. Weathering and Soils. 3 credits.
- GeoE 530. Advanced Physical Hydrogeology. 3 credits.
- GeoE 531. Hydrogeochmistry. 3 credits.
- GeoE 532. Contaminant Hydrogeology. 3 credits.
- GeoE 540. Water Sampling & Analysis. 3 credits.

Geology/Geological Engineering Undergraduate Courses with Graduate Credit:

- GeoE 311. Geomorphology. 4 credits.
- GeoE 320. Petrology. 3 credits.
- GeoE 321. Geochemistry. 3 credits.
- GeoE 323. Engineering Geology. 3 credits.
- GeoE 340. Digital Mapping Methods. 3 credits.
- GeoE 401. Geol Interpret of Aerial Photos. 3 credits.
- GeoE 405. Industrial Minerals. 3 credits.
- GeoE 406. Ore Deposits. 3 credits.
- GeoE 407. Petroleum Geology. 3 credits.
- GeoE 411. Sedimentology and Stratigraphy. 5 credits.
- GeoE 414. Geophysics. 3 credits.
- GeoE 415. Intro to Paleontology. 4 credits.
- GeoE 417. Hydrogeology. 3 credits.
- GeoE 418. Hydrogeological Methods. 2 credits.
- GeoE 419. Groundwater Monitoring and Remediation. 3 credits.
- GeoE 422. Seminar. 2 credits.
- GeoE 425. Design Hydrology for Wetlands. 3 credits.
- GeoE 427. Groundwater Modeling. 3 credits.

Course List for Mechanical Engineering Track

Mechanical Engineering Department Graduate Courses:

- ME 416. Advanced Manufacturing Processes. 3 credits.
- ME 426. Mechanical Vibrations. 3 credits.
- ME 429. Intro to Finite Elements. 3 credits.
- ME 446. Gas Turbines. 3 credits.
- ME 449. Internal Combustion Engines. 3 credits.
- ME 451. Heating and Air Conditioning. 3 credits.
- ME 464. Computational Fluid Dynamics. 3 credits.
- ME 476. Intermediate Fluid Mechanics. 3 credits.
- ME 477. Compressible Fluid Flow. 3 credits.
- ME 514. Processing of Advanced Materials. 3 credits.
- ME 523. Advanced Machine Design. 3 credits.
- ME 526. Advanced Vibrations. 3 credits.
- ME 529. Advanced Finite Element Methods. 3 credits.
- ME 532. Advanced Dynamics. 3 credits.
- ME 545. Fluidized-Bed Combustion Engineering. 3 credits.
- ME 574. Advanced Heat Transfer. 3 credits.

Students must take at least four 500 level ME courses from the above list or special topics.

**All Civil Engineering Graduate Courses
**All Chemical Engineering Graduate Courses
**All Electrical Engineering Graduate Courses
**All Geological Engineering Graduate Courses
**All Mathematics Graduate Courses

Students must have approval from their adviser to take courses from the above list.
able 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 required at the University of North Dakota.)

**Financial Assistance**

Financial aid available to graduate students includes Graduate Teaching Assistantships.

**Degree Requirements**

Master of Arts with Thesis

1. English 500; English 501 and 501L (for Graduate Teaching Assistants only); and either English 510 or 511. Courses must be completed with grades of A or B (S for 501L).

2. Up to 4 credits of Readings and Research courses (English 590 and 593) may be used to supplement the standard graduate offerings.

3. Four credits are allowed for the thesis.

4. Thirty credit hours are needed for the M.A., including the required courses listed above, the thesis (4 credits), and any Readings/Research courses (maximum 4 credits).

Doctor of Philosophy

1. English 500; English 501 and 501L (for Graduate Teaching Assistants only); and either English 510 or 511. Courses must be completed with grades of A or B (S for 501L).

2. Up to ten credits in addition to the four credits allowed for the M.A. may be in Readings and Research courses (English 590, 591, and 593).

3. Evidence of the mastery of scholarly tools appropriate to the proposed field of studies is required, including proficiency in one language other than English plus either another language or languages.

4. Completion of the scholarly tools and the comprehensive examinations, in areas or topics relevant to a student’s individual interests as recommended by the student’s Advisory Committee. These topics and areas will normally include a combination of at least four of the following: departmentally approved historical periods or movements; authors outside these periods or movements; critical, scholarly, or pedagogical theory and practice; literary genres, modes, or themes; studies in language; special topics in literature or language. These examinations will normally be taken after the coursework is completed.

5. 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 Graduate School: Completion of English 500 and either English 510 or 511 with grades of A or B; for Graduate Teaching Assistants, English 501 with a grade of A or B and 501L with a grade of S.

**Courses**

500. Introduction to Graduate Studies. 2 credits. Required of all candidates for advanced degrees in English. An introduction to graduate study and the profession.

501. Teaching College English. 3 credits. An introduction to theories and methods of teaching college English. Required of Graduate Teaching Assistants in English.

501L. Teaching College English Lab. 1 credit. The practicum part of English 501. Required of Graduate Teaching Assistants in English.

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.

511. Problems in Literary Criticism. 3 credits. A course in applied criticism. Repeatable when topics vary.

516. Creative Writing: Fiction Workshop. 3 credits. Prerequisite: upper-division undergraduate work in creative writing or permission of the instructor. 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.

517. Creative Writing: Poetry Workshop. 3 credits. Prerequisite: Engl 413 or 414, upper-division undergraduate work in creative writing or permission of the instructor. 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 once by M.A. students, three times by Ph.D. students.

520. Studies in English Literature. 1 to 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.

521. Studies in American Literature. 1 to 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.

522. Studies in English Language. 1 to 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.

524. Studies in Creative Writing. 3 credits. Prerequisite: Engl 516 or 517, or instructor’s permission. 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.

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.

531. Seminar in English Literature. 3 credits. Prerequisite: English 500. This class requires the preparation and delivery of a long research paper on an appropriate topic. Repeatable.

532. Seminar in American Literature. 3 credits. Prerequisite: English 500. Similar in method to English 531. Repeatable.

533. Seminar in English Language. 3 credits. Prerequisite: English 500. Similar in method to English 531. Repeatable.

590. Readings. 1 to 4 credits. American Literature; Cinema; English Literature; English Language; or Creative Writing. Prerequisite: English 500 and the consent of the Department. Supervised independent study. Repeatable.

591. Readings for Ph.D. Comprehensive Examinations. 1 to 4 credits. Prerequisite: Consent of the Department. 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.

593. Research. 1 to 4 credits. American Literature; Cinema; English Literature; English Language; or Creative Writing. Prerequisites: English 500 and the consent of the Department. Independent study of a problem in the field resulting in a long research paper or a series of short reports. Repeatable.

599. Special Topic. 1 to 3 credits. A course on varying topics. F.S.

998. Thesis. 1-4 credits.


The following undergraduate courses are eligible for inclusion on graduate programs of study with permission. Additional assignments are required of students taking these courses for graduate credit.

401. Studies in Medieval Literature. 3 credits.

403. Studies in Colonial American Literature. 3 credits.

404. Studies in Renaissance Literature. 3 credits.

405. Studies in Restoration and Eighteenth Century Literature. 3 credits.

406. Studies in Nineteenth Century Literature. 3 credits.

407. Studies in Twentieth Century Literature. 3 credits.

408. Advanced Composition II. 3 credits.

409. Art of the Cinematic Drama. 3 credits.

413. The Art of Writing: Poetry. 3 credits.

414. The Art of Writing: Fiction. 3 credits.

415. Special Topics in Literature. 1 to 4 credits.

417. Special Topics in Language. 1 to 4 credits.

418. Second Language Acquisition. 3 credits.

419. Teaching English as a Second Language. 3 credits.

422. History of the English Language. 3 credits.
Environmental Engineering

Professors: Bowman, Gerla, Ghassemi, Gullicks, Korom (Graduate Program Director), Mann, Moretti, Muggli and Seames

Program Description

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., and Certificate programs provide high-quality education and skill development opportunities, prepare 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 multi-disciplinary 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 entities such as the ND Department of Health; the ND State Water Commission; the Grand Forks Water Treatment Plant; the Grand Forks Wastewater Treatment Facility; the Grand Forks Traill Rural Water Users, Inc.; Simplot, Inc.; Advanced Engineering and Environmental Services, Inc.; CPS, Ltd.; EAPC Architects Engineers; Webster, Foster, Weston, Inc.; KBM, Inc.; the City of Devils Lake; and numerous small communities.

A Master of Engineering degree is also available, especially for Civil Engineering-oriented students. For this degree, a design-oriented project is completed in lieu of the master’s thesis. Special certificate programs are also offered in various concentrations and will consist of a group of three courses. The availability of a concentration will be published on the program web site, together with the schedule of courses offered, and the manner of delivery.

Admission Requirements

Master of Science

a) Bachelor of Science degree from an ABET accredited engineering program in Environmental, Chemical, Civil, or Geological Engineering.

b) 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.

c) An overall undergraduate GPA of at least 2.75, or 3.00 for the last two years.

d) Graduate Record Examination General Test for applicants from non-ABET accredited programs.

Master of Engineering

a) Bachelor of Science degree from an ABET accredited engineering program in Environmental, Chemical, Civil, or Geological Engineering.

b) 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.

c) An overall undergraduate GPA of at least 2.50, or 3.00 for the last two years.

d) Graduate Record Examination General Test for applicants from non-ABET accredited programs.

Certificate

a) Bachelor of Science degree in an ABET accredited engineering program in Environmental, Chemical, Civil, or Geological Engineering.

b) 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.

c) Graduate Record Examination General Test for applicants from non-ABET accredited programs.

The courses taken in a previously completed Environmental Engineering Certificate Program may be applied to a Master’s degree in Engineering.

Degree Requirements

Master of Science

In addition to the standard course requirements for a Master of Science Degree, the course of study of each student must include:

a) The following courses are required for all students:

   EnvE 562: Seminar in Environmental Engineering, 2 credits

   EnvE 591: Environmental Engineering Research, variable credits.

b) A minimum of three (3) credit hours must be taken from one of the following three Chemical Engineering courses:

   ChE 501, ChE 504, or ChE 512

c) A minimum of three (3) credit hours must be taken from one of the following three Civil Engineering courses: CE 531, CE 532, or CE 535.
d) A minimum of three (3) credit hours must be taken from one of the following Geological Engineering courses: GeoE 417 or GeoL 540.
e) A thesis documenting research conducted on a problem(s) related to Environmental Engineering is required.
f) Additional required coursework may be taken from approved engineering or physical science courses.

**Master of Engineering**

A total of 30 credits is required with at least 15 credits at the 500 level, and 15 credits in approved design courses. Additional requirements include:

a) The following courses are required for all students:
   - EnV E 562: Seminar in Environmental Engineering, 2 credits
   - EnV E 595: Design Project, 3 - 6 credits.
b) A minimum of three (3) credit hours must be taken from one of the following three Chemical Engineering courses:
   - ChE 501, ChE 504, or ChE 512.
c) A minimum of three (3) credit hours must be taken from one of the following three Civil Engineering courses:
   - CE 531, CE 532, or CE 535.
d) A minimum of three (3) credit hours must be taken from one of the following Geological Engineering courses:
   - GeoE 417 or GeoL 540.
e) Additional required coursework may be taken from approved engineering or physical science courses.

**Certificate**

a) A minimum of six (6) credit hours must be completed in Graduate level courses listed as EnV E, ChE, CE, Geol, or GeoE, and identified as qualified courses in the concentration area for which certification will be issued.
b) An additional three (3) credit hours must be completed in engineering or physical science courses identified as qualified courses in the concentration area for which certification will be issued. 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**

- EnV E 562: Seminar in Environmental Engineering. 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.
- EnV E 590: Special Topics in Environmental Engineering. 1 to 3 credits. Topics of current interest.
- EnV E 591: Environmental Engineering Research. 1 to 6 credits, repeatable. Supervised research work in environmental engineering.
- EnV E 595: Design project. 3 to 6 credits. Engineering design experience involving individual effort and formal written report and presentation.
- EnV E 998: Thesis. 1 to 9 credits. Development and documentation of scholarly activity demonstrating proficiency in Environmental Engineering at the master’s level. S/U grading only. F,S,SS.

The following are approved engineering courses that may be used to fulfill requirements for a major or minor in Environmental Engineering:

- ChE 501. Advanced Transport Phenomena
- ChE 504. Air Pollution Control
- ChE 507. Advanced Unit Operations
- ChE 509. Advanced Thermodynamics
- ChE 510. Advanced Chemical Process Control
- ChE 511. Advanced Chemical Engineering Kinetics
- ChE 512. Advanced Separation Processes
- ChE 515. Design of Experiments
- ChE 535. Metallic Corrosion and Polymer Degradation
- CE 531. Environmental Engineering III
- CE 532. Environmental Engineering IV
- CE 533. Industrial Wastes
- CE 535. Hazardous Waste Management
- Geol 500. Sedimentary Geology
- Geol 508. Isotope Geology
- Geol 509. Advanced Mineralogy
- Geol 525. Weathering and Soils
- Geol 530. Advanced Hydrogeology
- Geol 531. Hydrogeochemistry
- Geol 532. Contaminant Hydrogeology
- Geol 540. Water Sampling & Analysis

Refer to the Environmental Engineering Graduate Program list for other acceptable graduate and undergraduate courses.

**Forensic Psychology**

**Professors:** Antes, Bradley*, Derenne, Ferraro, Grabe, Holm, King, McDonald, Miller, Muelenkamp, Peters* (Program Director), Petros, Terrace*, Weatherly (Chair), and Wise*

*Forensic core-program faculty

**Program Description**

**Master of Arts**

The Department of Psychology, in conjunction with the Division of Continuing Education, has designed an online forensic psychology program targeted for working professionals. The M.A. Forensic Psychology program is the first to be offered online by a nationally recognized, fully accredited university. Through the 34 credit M.A. program, students will learn how to provide the psychological expertise and knowledge needed by the legal community and agencies having a strong forensic focus. Students in the program will likely be in-service professionals, such as law enforcement personnel, who want to further their career, as well as those with a behavioral or social science background, such as counselors or social workers, who are interested in applying psychology to their work involving forensic issues.

UND’s high-quality forensic psychology program gives you: knowledge of advanced psychological concepts and theories related to contemporary forensic issues, outstanding analytical, statistical and evaluation skills, enhanced communication skills needed to function effectively in forensic settings, in-depth understanding of our legal system and the roles forensic psychologists play.

**Master of Science**

In the U.S. forensic graduates obtain master’s-level psychology jobs in agencies and institutions such as prisons, juvenile facilities, social service agencies, police departments, child care agencies, probation, parole, family court, addiction services, hospitals, and community mental health centers. Some students get jobs as forensic researchers doing studies and evaluations of at-risk populations. A few graduates will be accepted in federal law enforcement agencies after earning the Master’s degree. You would expect to see forensic graduates working in the following areas: secure forensic units in state facilities, jails/prisons, probation services, court service units, community mental health centers, protective services, violence risk assessment, specialized agencies (ie. child advocacy centers), law enforcement, and trial consulting. The M.S. degree in forensic psychology will also allow some students to advance to doctoral programs in forensic psychology, forensic science, and law school.

Students in the M.S. Forensic Psychology Program at UND are required to complete 44 credits. This includes 26 credits of required course work, 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.
Minimum Admission Requirements

Master of Arts
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 3.2 or above, or a graduate grading GPA of at least 3.75.
3. Completion of the Graduate Record Examinations (GRE).
4. Submission of a 250-300 word essay discussing your reasons for pursuing a graduate degree in forensic psychology.
5. Submission of three letters of recommendation from those who can comment on your academic abilities or ability to understand complex issues and think critically.

If you do not meet these admission standards, you may be admitted on a provisional basis with continued enrollment contingent on successful performance in the program. Consideration will also be given if you have prior experience of working in forensic areas.

Master of Science
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, social work.
2. Applicants must have a cumulative undergraduate GPA of 3.2 or above or a graduate GPA above 3.0.
3. Applicant must also submit GRE scores, with Analytic GRE writing test score ≥ 2.5; and Verbal and Quantitative GRE scores must both equal or exceed the 30th percentile. The Psychology subject GRE test is also required. Applicants not meeting these standards may be admitted on a provisional basis with continued enrollment contingent on successful performance in the program.
4. A 250-300 word essay discussing reasons for pursuing a graduate degree in forensic psychology and research interests is required as part of the admissions material to be submitted.
5. Three letters of recommendation from those who can comment on the applicant’s academic abilities are also required. Consideration will be given for experience working in forensic areas of participating in research as an assistant prior to the program application.

Degree Requirements

Master of Arts
Required Core Courses:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>PSYC 520</td>
<td>Foundations of Forensic Psychology</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 521</td>
<td>Diversity Psychology</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 524</td>
<td>Psychology and Law</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 528</td>
<td>Forensic Psychology Capstone (summer, 2 weeks on campus immediately prior to graduation)</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 541</td>
<td>Advanced Univariate Statistics</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 560</td>
<td>Advanced Social Psychology</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 575</td>
<td>Behavior Pathology</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 593</td>
<td>Readings in Psychology</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 997</td>
<td>Independent Study</td>
<td>2 cr</td>
</tr>
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(Relate and practicum experience possible)

Elective Courses:

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<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>PSYC 501</td>
<td>Psychological Foundations of Education</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 526</td>
<td>Psychological Profiling &amp; Criminal Behavior</td>
<td>3 cr</td>
</tr>
<tr>
<td>PSYC 539</td>
<td>Cognitive Psychology</td>
<td>3 cr</td>
</tr>
</tbody>
</table>

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 elective for a required course.

Program Description

The Geography Department graduate program includes both thesis and non-thesis options leading to the M.A. and M.S. degrees. 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 program provides 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 of each year to receive fullest consideration for acceptance and funding.

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 cognate courses in business and public administration, international relations, anthropology and archaeology, sociology, languages, and other fields appropriate to their goals.

The M.S. option in environmental geography reflects a geographic focus on land use, 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.

More complete information regarding faculty, laboratory facilities, recent publications and paper presentations, coursework, and entry level graduate placement can be obtained from our web page at: http://www.und.edu/dept/Geog/mainpage.htm.

**Admission Requirements**

1. A GPA of at least 3.00 in all undergraduate work.
2. A minimum of 9 semester credits of undergraduate work in geography with at least one course in each of the following fields: physical, human, regional, and techniques.
3. Six (6) credits in fields cognate to geography.

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 on a qualified basis with the understanding that deficiencies will be met by the end of the second registration.

**Degree Requirements**

1. Two required courses, Geog 501 and Geog 578.
2. One required seminar, Geog 541.
3. A minor or cognate area of study, and a graduate program of study that reflects the student’s focus on physical (M.S.) or human (M.A.) topics.

**Thesis**

1. A minimum of 30 semester credits, including 9 semester credits for approved minor or cognate courses.

**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.

**Certificate Program**

The Geography department also 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, remotely sensed imagery, and global positioning system (GPS) coordinates. The goal of GISc is to model landscapes digitally and to enable the mathematical 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 Graduate School. The certificate is designed to serve: a) non-geography graduate students currently pursuing a graduate degree from UND, and b) 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.

**Certificate 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 recommended courses (see below).
3. A “B” grade or better in all core and elective courses.
4. Completion time of no more than five years.

**Required Core Courses:**

- Geog 471/L Cartography and Computer Assisted Mapping (3 credits)
- Geog 474 Introduction to GIS (3 credits)
- Geog 574 Advanced Techniques in GIS (3 credits)

**Elective Courses (at least 3 credits from):**

- Geog 377/L Quantitative Applications in Geography (3 credits)
- Geog 475 Digital Image Processing (3 credits)
- Geog 575 Seminar in Remote Sensing (3 credits)
- Geog 591 Directed Studies in Geographical Problems (1-4 credits)

**Courses**

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.

521. Advanced Physical Geography. 3 credits. Prerequisite: consent of instructor. An investigation of an advanced topic in physical geography. May be repeated if a different topic is examined.

537. Graduate Co-operative Education. 1-3 credits. Prerequisites: MS/MA students must have minimum of 12 graduate credits, permission of department chair or co-op coordinator. (Only students in the MS/MA non-thesis option are eligible). Practical experience of applying advanced concepts of geography. Experience will vary from student to student and must be coordinated with co-op host.

541. Seminar in Geography. 3 credits. Prerequisites: Geography 578 and graduate standing in geography. A seminar that includes discussions of selected readings, student reports, and student research projects leading to oral and written presentations.

551. Advanced Human Geography. 3 credits. Prerequisite: consent of instructor. An investigation of an advanced topic in human geography. May be repeated if a different topic is examined.

560. Seminar in Regional Geography. 3 credits.

574. Advanced Techniques in Geographic Information Systems. 3 credits. Prerequisites: Geography 474 or equivalent. 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.

575. Seminar in Remote Sensing. 3 credits. Prerequisite: Geography 475 or consent of instructor. A seminar in the analysis of remote sensing techniques as applied to contemporary research problems in geography.

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.

578. Geographic Research and Writing. 2 credits. Prerequisite: Graduate standing. Required of all graduate students during the first semester in which they are registered as a candidate or the first semester offered. 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.
Geological Engineering

Professors: Forman, Gerla, Ghassemi (Graduate Director), Gosnold, Hartman, Josephs, Korom, LeFever, Matheney and Perkins

Program Description

The Master of Science in Geological Engineering is designed to develop students into highly qualified engineers capable of conducting research and solving complex problems related to petroleum/geothermal energy, geo-environmental concerns and natural hazards. The program offers both thesis and non-thesis options. 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 higher level degrees such as the Ph.D. in Engineering offered at UND.

Admission Requirements

Admission to the master’s degree program in Geological Engineering requires a B.S. in Geological Engineering or related field with a cumulative grade point average of at least 3.0. Specific requirements over and above the UND Academic Catalog requirements are as follows:

1. A Bachelor of Science degree from an ABET accredited engineering program in Geological Engineering qualifies a student for admission into “fully approved” status;
2. 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;
3. The Graduate Record Examination General Test is required if you have a degree from a non-ABET accredited program.

Degree Requirements

Thesis Option

Completion of 30 semester hours (24 credits of coursework, 6 credits of thesis work). The coursework should include at least 12 credit hours of Graduate level coursework from Geology and Geological Engineering. The remaining 12 credits of graduate work may be taken from other engineering or science departments as part of a program of study to best meet the educational objectives of the student and the degree program.

Independent Study

(Non-thesis Option)

Completion of 34 semester hours including completion of a project (equivalent to 3 credits). The coursework should include at least 15 credit hours from Geology and Geological Engineering as part of a program of study that best meets the educational objectives of the student and the degree program.

Geology

Professors: Forman, Gerla (Graduate Program Director), Ghassemi, Gosnold (Chair), Groenewold, Hartman, Josephs, Korom, LeFever, Matheney and Perkins

Program Description

The Department of Geology and Geological Engineering offers programs of study leading to the degrees Master of Arts, Master of Science, and Doctor of Philosophy. Research emphasis is currently in the following areas: 1) hydrogeology, environmental geology, and geological engineering; 2) economic geology of petroleum, coal, and mineral resources; 3) sedimentology, stratigraphy, and paleontology; 4) geomorphology and soils; 5) petrology and geochemistry; 6) geophysics and tectonics; and 7) interdisciplinary geological projects involving several research areas including integrated basin analysis, surface mining and reclamation, and underground coal gasification. For more detailed information, please visit our web site at: http://www.geology.und.edu.

Admission Requirements

Applicants must complete the following for admission under approved status:

1. At least 25 semester credit hours (ten or more upper division) in geology with a GPA of 3.00 or greater. Students without a geology degree may substitute upper division credit hours in other science or engineering courses for up to ten of the required 25 geology credits, with advisory committee approval.
2. Geology field camp (minimum of five semester credit hours).
3. One year minimum of college chemistry and physics.
4. One semester of calculus (equivalent to Math 146 or Math 165 at UND) for the M.A. degree; two semesters of calculus (equivalent to Math 165 and 166 at UND) and at least three credits in statistics, computer programming, or advanced mathematics (an additional calculus course, linear algebra, differential equations or advanced analysis/engineering math) for the M.S. and Ph.D. degrees.
5. Applicants are expected to score at the 50th percentile or better on the Graduate Record Examination general test.

Students missing any of these may be admitted under provisional or qualified status, but all admission requirements must be completed, without graduate program 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.

Undergraduate students in the Geology, Geological Engineering, or Environmental Geology and Technology majors are eligible for early admission to the M.S. program on Qualified status, providing that they have:

1. Completed 95 semester credit hours of coursework.
2. Completed 30 semester hours of coursework and 8 hours of upper division coursework in the geological sciences, including the equivalent of physical and historical geology.
3. Achieved a GPA of 3.0 or better in the geological sciences.

Advancement to Approved status will occur when the student has completed the graduation requirements for the bachelor’s program they are enrolled in, and when all deficiencies have been removed.
Undergraduate students admitted on Qualified status are eligible to take 500 level courses in their last two semesters prior to completing the bachelor’s degree requirements. 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.

Degree Requirements

Please see the Degree Requirements section of the Graduate catalog for the general requirements for the M.A., M.S., and Ph.D. degrees.

Master of Arts and Master of Science

The Department expects every graduate student to have breadth in geology. Before a student can be advanced to candidacy, he or she must demonstrate such breadth by completing at least 20 semester hours from subdisciplines listed below. A minimum of 6 semester credits must come from each subject area:

a) mineralogy, petrology, geochemistry
b) sedimentology, stratigraphy, paleontology, geomorphology
c) structural geology, geophysics, hydrogeology

The time normally needed to complete the requirements for the masters degree in geology is about two years of full-time work. Students with graduate teaching or research assistshipships may need more time.

Depending upon the total number of undergraduate hours in geology, the undergraduate training in related sciences, and the area of geology selected for graduate work, up to 12 hours of 300-400 level coursework in geology (and of courses listed in the Graduate section of the catalog) may be taken for graduate credit.

Doctor of Philosophy

Please see the Degree Requirements section for the general degree requirements. Students normally take the equivalent of three years of full-time work beyond the master’s degree for the doctorate.

1. In certain cases, a qualifying examination may be required before the end of the student’s first year in a doctoral program.

2. Demonstration of: 1) proficiency in two foreign languages, or 2) proficiency in one foreign language and two scholarly tools courses, or 3) proficiency in four scholarly tools courses. (Scholarly tools courses typically are advanced undergraduate courses in related fields in mathematics, science, or engineering.)

Courses

Most of the 500-level courses listed below are offered at least once every three semesters. Others are offered less frequently, on demand.

500. Sedimentary Geology. 1 to 4 credits. Prerequisite: Consent of instructor. A sequence of courses emphasizing: A. sedimentary processes and deposits; B. carbonate petrology; C. clastic petrology; and D. analysis of depositional systems.

505. Isotope Geochemistry. 3 credits. Prerequisites: Geology 321, or permission of instructor. Geochemistry and cosmochemistry of radioactive and stable isotopes; isotope equilibria; applications in paleoclimatology, environmental isotopic analysis, igneous, metamorphic, and sedimentary petrology.

506. Glacial Geology. 4 credits. 3 hours lecture, 2 hours laboratory. Prerequisite: Geology 311. Origin, growth, and movement of glaciers; landforms and deposits incident to glaciation.

509. Advanced Mineralogy. 1 to 4 credits. Prerequisite: Geology 320. Geology 321 is also recommended. Advanced study of specific mineral groups or selected topics in mineralogy.

511. Advanced Structural Geology. 4 credits. Reading and research in special topics in structural geology and geotectonics.

512. Advanced Petrology. 1 to 4 credits. Prerequisite: Geology 320. Selected topics in petrology taught using conventional lecture and laboratory/field approach.

515. Advanced Paleontology. 3 to 4 credits. Prerequisites: Geology 415, Biology 101, or consent of instructor. A sequence of courses emphasizing A. Invertebrate paleontology; B. Evolution and the fossil record; C. Palaeocology; D. Paleontological procedures; E. Micropaleontology.

518. Topics in Advanced Stratigraphy. 2 to 4 credits. Prerequisites: Geology 411, 415. Selected topics in lithostratigraphy and biostratigraphy.

520. Statistical Applications in Geology. 3 credits. Prerequisites: An introductory statistics course, such as CTIL 515 or Psych 241, and consent of instructor. 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.

522. History and Philosophy of Geology. 3 credits. Prerequisite: Permission of instructor. Historical and philosophical development of the science of geology.

523. Topics in Advanced Geomorphology. 1 to 4 credits. Prerequisite: Geology 311. Selected topics in geomorphic processes and landforms.

525. Weathering and Soils. 3 credits. Prerequisites: Geology 311 and 411 or consent of instructor. Properties and classification of soils; the factors and processes of weathering and soil formation.

530. Advanced Physical Hydrogeology. 3 credits. Prerequisites: Geol/GeoE 417, Geol 427, Math 265, or consent of instructor. Selected topics in ground and soil water movement, fracture flow, analytical/numerical modeling, and groundwater supply.

531. Hydrogeochimistry. 3 credits. Prerequisite: Geology 321, Math 166, or permission of instructor. The origin, characteristics and modeling of surface and ground water geochemistry.

532. Contaminant Hydrogeology. 3 credits. Prerequisites: Geol/E 417, Geol/E 427, Math 265, or consent of instructor. Chemical and physical processes affecting contaminant behavior in groundwater with analytical/numerical modeling and case studies.

540. Water Sampling & Analysis. 3 credits. Prerequisite: Chemistry 121. 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.

590. Research. 1 to 4 credits. Laboratory, field, or library research on problems of interest (may be repeated).

591. Directed Studies. 1 to 4 credits. Directed advanced research in a specialized field of geologic study (may be repeated).


311. Geomorphology. 4 credits.

320. Petrology. 3 credits.

321. Geochemistry. 3 credits.

323. Engineering Geology. 3 credits.

340. Digital Mapping Methods. 3 credits.

401. Geological Interpretation of Aerial Photographs. 3 credits.

405. Industrial Minerals. 3 credits.

406. Ore Deposits. 3 credits.

407. Petroleum Geology. 3 credits.

411. Sedimentology and Stratigraphy. 5 credits.

414. Geophysics. 3 credits.

415. Introduction to Paleontology. 4 credits.

417. Hydrogeology. 3 credits.

418. Hydrogeological Methods. 2 credits.

419. Groundwater Monitoring and Remediation. 3 credits.

422. Seminar. 1 credit.

425. Design Hydrology for Wetlands. 3 credits.

427. Groundwater Modeling. 3 credits.

Higher Education

See Education: Educational Leadership & Teaching and Learning

History

Professors: Berger, Broedel, Burin, Caraher, Iseminger (Graduate Program Director), Kelsch, Mochoruk, Porter (Chair) and Reese

Program Description

The department of History offers programs leading to the Master of Arts degree, the Doctor of Arts degree, and the Ph.D. 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 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.

**Master of Arts**

**Admission Requirements**

1. Undergraduate preparation of a minimum of 20 semester credits in history with at least six credits at the upper division level.
2. An overall undergraduate GPA of at least 3.00 and at least 3.25 in all undergraduate history courses.
3. A writing sample of 8-10 pages, preferably a research or seminar paper (submitted directly to the department’s Director of Graduate Study).

**Degree Requirements**

1. A total of 30 credits including 21 in either United States or European history and 9 credits in: a) a field of history not included in the primary concentration, such as United States or European History, or b) a minor in a related discipline such as Communications, English, Geography, or Sociology, or c) a cognate as defined in the Degree Requirement section of this catalog.
2. Research seminars, either 511 or 515.
3. At least one readings course, either 593 or 594.
4. History 502, Historiography, counted as three credits in the major concentration.
5. Six credits of thesis.

**Doctor of Arts**

This degree is designed to prepare those whose primary interest is teaching history at the undergraduate collegiate level. It places heavy emphasis upon subject matter and a supervised teaching internship. The internship requires teaching a survey course for one semester during the second year of the program and a second course for one semester at the 200 or 300 level during the third year. The department offers five fields of study: Ancient World, Early Modern Europe, Modern Europe, United States to 1877, and United States since 1877.

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.

**Admission Requirements**

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. Taking the Graduate Record Examination is optional, but recommended for those whose previous academic record makes their admission questionable or those who have been out of school for several years. High GRE scores may indicate sufficient promise to permit admission of applicants with inadequate grade point averages or insufficient courses. The department may require the GRE as a condition of admission if preliminary examination of the student’s application indicates that the score would be helpful in determining ability to do graduate level work.

It is recommended that applicants have at least two years of teaching experience in history, the social sciences, or the humanities.

**Degree Requirements**

1. History 502, 511 or 515, 551, 595, and 599.
2. One three-credit course taken outside of the department, preferably Psychology 501, Psychological Foundations of Education (other courses acceptable with departmental approval).
3. A teaching internship of eight credits.
4. A cognate of a minimum of 12 credits from such areas as the social and behavioral sciences or the humanities.
5. A 20-credit-hour area of concentration from one of the fields listed above which includes a 5-credit independent research project representing a sustained creative effort exploring a significant topic of concern to historians and teachers of history.
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 72 hours of the program of study have been completed.)
7. Before receiving their degrees, all students will have taught both Western Civilization survey courses (History 101 and History 102) and both United States History survey courses (History 103 and History 104) or their equivalents. This requirement may be satisfied by teaching as a Teaching Assistant in the department or by teaching in the internship or, if approved by the department, by having previous teaching experience.

Students in both D.A. and M.A. programs should consider taking the Public History courses, 480 and 481, and some work in records management; or geography, including cartography; or journalism; to increase employment opportunities.

**Joint Ph.D. Program with NDSU**

**Admission Requirements**

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. Preference for admission into the Ph.D. program with full graduate standing will be given to applicants who present acceptable scores on the Graduate Record Examination.
5. The program requires students for whom English is a second language to have a minimum TOEFL score of 600.
6. Students seeking admission for the fall semester must submit a complete application by February 10. Students seeking admission for the spring semester must submit their complete application by September 15.

**Major Fields**

- Great Plains History
- Rural History
- North American History
- Western European History
Minor Fields

Public History
World History

Degree Requirements

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 in the home university. At least one member of the student’s committee must be employed at the other (not home) university. Students may have to take courses at both universities.

4. Students will write three comprehensive examinations in their major and minor fields. The exams will be read and graded by the supervisory committee. Students will complete an oral examination based on the written exams. The oral examination is to be conducted by the supervisory committee.

5. Students will write a dissertation (up to 24 credits) on an approved topic in consultation with the faculty adviser and the supervisory committee of five faculty. The dissertation must be based on extensive research in primary and secondary sources, must argue an original thesis, and must be defended before the supervisory committee.

6. The committee will be composed of the faculty adviser who represents the student’s field of study and who will direct the research and writing of the dissertation. A second member of the committee (second reader) represents the student’s major field of study. 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 Graduate School will appoint the fifth member of the committee.

Residency Requirements

Students enrolled in the Ph.D. program are required to complete at least one academic year (18 credits minimum) in residence at one campus.

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.

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.

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.

Assistantships

Students may apply for assistantships (based on availability) at the campus of their residency during their period of residency. Students will be limited to three years (six semesters) of assistantships.

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 University of North Dakota can be accessed online. In addition, each university maintains a special collections library.

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

501. Methods of Historical Research. 3 credits. Prerequisite: graduate status. 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 data bases and bibliographical aids to find, identify, and assess appropriate information to support, modify, or reject historical interpretations and arguments.

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.

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.

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.

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.

551. Seminar in the Teaching of History. 1 to 4 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/ U grading only.

585. Directed Readings. 3 credits. Prerequisites: Graduate Status. Independent, directed readings on a topic tailored to the individual needs of the student. (No more than 3 hours of HIST 585 can count as credit towards a Doctoral Program without the approval of the Chair, the Graduate Director, and the Adviser.)

592. Readings in World History. 3 credits. This course focuses upon the reading and understanding of World History historiography, theories and methods through thematic and comparative readings. Repeatable.

593. Readings in American History. Topics vary. 1 to 3 credits.

594. Readings in European History. Topics vary. 1 to 3 credits.

595. Research. 1 to 5 credits. For candidates for the Doctor of Arts only. Requires a research project that will be a component of the area of concentration. Repeatable to the required maximum of five credits.

599. Internship in the Teaching of History. 1 to 12 credits. For candidates for the Doctor of Arts only. The internship requires the teaching of two or 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. Eight credits of internship are required, but the course may be repeated to a maximum of twelve credits. SU grading only.

1 All 593 and 594 courses involve reading, bibliographical study, discussion, and writing. Study may be confined to a subtopic within the general subject area. Repeatable with different subtopics. Students in the M.A. program will not ordinarily take more than one 593 or 594 in the primary concentration.

The following undergraduate courses are eligible for inclusion on graduate programs of study. Additional assignments and higher standards of accomplishment are required of students taking these courses for graduate credit. See the Undergraduate Section for course descriptions.

332. Women in American History to 1865 3 credits.
333. Women in American History since 1865 3 credits.
343. Ancient Greece 3 credits.
344. Ancient Rome 3 credits.
345. The Ancient Near East 3 credits.
350. Europe: The Reformation, 1500-1648 3 credits.
351. Europe: Age of Absolutism, 1648-1789 3 credits.
352. Europe: French Revolution and Napoleonic Era, 1789-1815 3 credits.
353. Europe: 1815-1918 3 credits.
355. Europe: Since 1918 3 credits.
403. The United States Colonial Period 3 credits.
404. The United States Revolutionary Era, 1760-1789 3 credits.
405. The United States: Age of Jefferson and Jackson, 1789-1850 3 credits.
406. The United States: Civil War—Reconstruction, 1850-1877 3 credits.
407. The United States: Rise of Industrial America, 1877-1920 3 credits.
408. The United States: 1920-1945 3 credits.
410. History of Mexico 3 credits.
412. U.S. Foreign Relations Since 1900 3 credits.
413. The United States Since 1945 3 credits.
414. France Since 1815 3 credits.
415. Germany Since 1815 3 credits.
416. Russia to 1855 3 credits.
417. Russia Since 1855 3 credits.
419. Great Britain Since 1815 3 credits.
470. United States-Canadian Relations, 1776 to Present 3 credits.
480. Introduction to Public History 3 credits.
481. Public History Practice 3 credits.

Industrial Technology
Professors: Diez (Graduate Program Director), Huang, Kenney and Yearwood (Chair)

Program Description
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.

Admission Requirements
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 technology education or industrial technology or related field of study.

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
Master of Science

A. Thesis Option:
Required: A minimum of 30 credits including 9 credits for approved minor or cognate courses.
EFR 515 or
EFR 516 ... Statistics I, II .................................................. 3
IT 500 ..... Introduction to Graduate Studies ...................... 1
IT 525 ..... Research in Industrial Technology .................... 3
IT 545 ..... Seminar in Industrial Technology ....................... 1
IT 550 ..... Industrial Technology Management ................... 3
IT 598 ..... Thesis ................................................................... 4

B. Non-Thesis Option:
Required: A minimum of 32 credits including 9 credits for approved minor or cognate courses.
EFR 515 .. Statistics I ......................................................... 3
IT 500 .... Introduction to Graduate Studies ...................... 1
IT 525 .... Research in Industrial Technology .................... 3
IT 545 .... Seminar in Industrial Technology ....................... 1
IT 550 ..... Industrial Technology Management ................... 3
IT 597 .... Independent Study ............................................ 2

C. Optional courses for Thesis or non-Thesis Options
510 ...... History of Technology ........................................... 3
537 ...... Graduate Cooperative Education ......................... 1-3
540 ...... Supervision and Industrial Training ....................... 3
555 ...... Lean: Ideas and Practice ......................................... 3
560 ...... Quality Planning and Analysis ............................. 3
590 ...... Special Topics .................................................. 1-4
591 ...... Readings in Industrial Technology ......................... 1
593 ...... Technical Problems in Industrial Technology ....... 1-3

D. General:
1. At least one-half of the credits in the student’s Program of Study must be at or above the 500 level.
2. Degree requirements identified by the Graduate School must be met.
3. The approved Program of Study must be completed.

Courses
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. A prerequisite will be to develop a program of study.
510. History 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.
525. Research in Industrial Technology. 3 credits. An introduction to research methodologies used in Industrial Technology. Theoretical and practical issues associated with quantitative and qualitative methods will be covered. With the major focus to explore and develop research, students will examine published studies and gain practical experience conducting research.
537. Graduate Cooperative Education. 1 to 3 credits. A relevant field experience in government, industry, or business. Students must have their internships approved by the department.
540. Supervision and Industrial Training. 3 credits. Study and investigation of principles and techniques involved in supervision and technical training for industry and education. The application of supervisory techniques with emphasis on the analysis of industrial operations and the design, implementation, and evaluation of training programs through total quality management.
545. Seminar in Industrial Technology. 1 credit. Prerequisite: IT 525 and consent of adviser. A series of presentations on research pertaining to industrial technology. Students will prepare, present, and discuss a professional research paper.
550. Industrial Technology Management. 3 credits. Expectations of managerial responsibilities of the typical industrial technology career. Strategic and systems approaches to product and process technologies. The role of changing technology in manufacturing function.
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.

560. Quality Planning and Analysis. 3 credits. Advances in quality planning and design, measurement, quality assurance, process control, supplier quality, and improvement concepts in business and industry. Administrative, functional and logistics aspects of statistical quality control with computer applications.

590. Special Topics. 1 to 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.

591. Readings in Industrial Technology. 1 credit. Prerequisite: consent of advisor. Examination of the professional literature in industrial technology as part of an area of specialization or interest.

592. Technical Problems in Industrial Technology. 1 to 3 credits. Research and experimentation relating to contemporary problems, issues, and/or application of either electronic and control systems, advanced graphic communication, or materials and manufacturing techniques. An individual and/or group may conduct an investigation on a problem. One credit per problem. Course may be repeated for a total of three credits.

### Instructional Design and Technology

**Professors:** Borysewicz, Grabe and Van Eck (Graduate Program Director)

#### Program Description

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 Graduate School, and NDUS rules and policies. All degree options are available online and on-campus.

#### Program Mission

The primary mission is to prepare program graduates for service in education, business, government, and industry who will enhance instruction and learning through the use of instructional design and technology. These graduates will be able to design curriculum, training, and human performance solutions using any medium, and for any subject area, environment or learner.

#### Minimum Admission Requirements

The IDT program follows the regular Graduate School requirement of 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 program. The grade point average requirement for graduate work is a 3.5 or better. 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. Applicants must also answer two essay questions as part of the application process.

The applicant must have completed a baccalaureate degree in a field of study in the area or discipline appropriate to the field in which he or she intends to work. The applicant must have a basic knowledge of the microcomputer and substantial skill in using standard applications to produce work products (word processing, database, spreadsheet, drawing/painting, graphing, and other common applications).

#### Program Delivery Options

The IDT program is available for on-campus and distance delivery, making it possible to attain all degree options via distance delivery, on-campus courses, or a combination of both. Students may enroll in on-campus classes and attend these classes in person or may enroll in online classes and attend classes via distance technology. 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.

#### Degree Requirements

The IDT master’s degree program offers three options: the M.Ed., M.S. (scholarly project option) and the M.S. (thesis option). These programs are comprised of 34 (M.Ed. and M.S. scholarly project option) or 36 (M.S. thesis option) credits. The credit hours consist of:

<table>
<thead>
<tr>
<th></th>
<th>M.Ed.</th>
<th>M.S.</th>
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<tbody>
<tr>
<td>Core coursework in Instructional Design &amp; Technology</td>
<td>9 cr.</td>
<td>9 cr.</td>
</tr>
<tr>
<td>Additional coursework in IDT area of emphasis</td>
<td>6 cr.</td>
<td>9 cr.</td>
</tr>
<tr>
<td>Foundations coursework in education and psychology</td>
<td>6 cr.</td>
<td>3 cr.</td>
</tr>
<tr>
<td>Scholarly Tools/Research</td>
<td>3 cr.</td>
<td>6 cr.</td>
</tr>
<tr>
<td>Electives</td>
<td>6 cr.</td>
<td>3 cr.</td>
</tr>
<tr>
<td>Internship</td>
<td>2 cr.</td>
<td>2 cr.</td>
</tr>
<tr>
<td>Scholarly Project or Thesis</td>
<td>2-4 cr.</td>
<td>2-4 cr.</td>
</tr>
<tr>
<td>Total</td>
<td>34 (Project) or 36 (Thesis)</td>
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The IDT degree options are based on the same set of program components:

- **Program core component**: New courses presenting IDT content.
- **Research component**: Development of research skills.
- **Foundations component**: Fundamental background in psychology.
- **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 both the M.Ed. and M.S. options will be required to complete 15 (M.Ed.) to 18 (M.S.) hours of coursework in IDT subject matter. This requirement includes:

#### Course Credits

- **IDT 500**: Survey of Instructional Design ............................... 3
- **IDT 520**: Instructional Systems Design & Development ........ 3
- **IDT 525**: Development, Implementation and Evaluation of Instructional Materials .................................................. 3
- And 6 (M.Ed.) to 9 (M.S.) credit hours from the following courses:
  - **IDT 590**: Special Topics in IDT .............................................. 1-3
  - **IDT 591**: Readings in IDT ..................................................... 1-3
  - **IDT 592**: Research in IDT (M.S. must take as scholarly tool, does not count toward cognates) ........................................ 1-3
  - **IDT 593**: Directed Studies in Instructional Design and Technology 1-3
K-12 Emphasis
IDT 510: Technology-Based Instruction: Applications & Methods... 3
IDT 540: Digital Media and the Internet in Schools .................. 3

Corporate Emphasis
IDT 560: Instructional Design Consulting ....................... 3
IDT 570: Human Performance Technology ....................... 3

Computer- and Web-Based Instruction
IDT 530: Introduction to Computer-Based Instruction ........ 3
IDT 535: Advanced Computer-Based Instruction Development .... 3
IDT 545: Instructional Simulations & Games .................... 3
IDT 580: Introduction to Web-Based Instruction .............. 3

Master of Education
The Master of Education (M.Ed.) degree is primarily intended for students who plan to work in an education environment, either the K-12 schools or 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 the use of technology. 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 and practical issues associated with technologically supported instruction but their emphasis will be in the application of this knowledge in terms of best practice. 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.

Master of Science
The Master of Science (M.S.) 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. Students from backgrounds other than education, e.g., nursing, engineering, aerospace, may prefer this option. This degree is available in two tracks. The M.S. (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 M.S. (scholarly project option) is intended for those students who prefer to emphasize the development and evaluation of application and practice. Required coursework within the two options is consistent with this distinction between an emphasis on research or practice.

IDT Certificate Programs
The IDT Certificate Program offers two 12-credit certificates. They are designed for those who do not need or want a full master’s program, but who want documentation of their skills in instructional design and technology. The certificates provide minimum competencies in the field of instructional design, but are not designed to result in fully-qualified instructional designers.

IDT Certificate in K-12 Technology Integration
Program Requirements
Required Courses (12 credits):
IDT 500: Survey of Instructional Design ....................... 3 credits
IDT 510: Technology-Based Instruction:
Applications & Methods ........................................... 3 credits
IDT 520: Instructional Systems Analysis & Design ........... 3 credits
IDT 540: Digital Media & the Internet in Schools ........... 3 credits

IDT Certificate in Corporate Training and Performance
Program Requirements
Required Courses (12 credits):
IDT 500: Survey of Instructional Design ....................... 3 credits
IDT 520: Instructional Systems Analysis & Design ........... 3 credits
IDT 530: Intro. to Computer-Based Instruction ............... 3 credits
IDT 570: Human Performance Technology .................... 3 credits

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 must take IDT 500, IDT 520, and IDT 525 for a total of nine semester hours. 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.

Courses
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.

510. Technology-Based Instruction: Applications and Methods. 3 credits. A study of 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.

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.

525. Development, Implementation, and Evaluation of Instructional Materials. 3 credits. Prerequisites: Program major or permission of instructor; IDT 520. 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.

530. Introduction to Computer-Based Instruction. 3 credits. Prerequisite: IDT 520. 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.

535. Advanced Computer-Based Instructional Development. 3 credits. Prerequisite: Program major; IDT 530. 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, and 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.

540. Digital Media and the Internet in Schools. 3 credits. Prerequisites: IDT 510, 520. 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.

545. Instructional Simulations and Games. 3 credits. Prerequisites: Program major or permission of the instructor; IDT 530. 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.

550. Theories and Models of Instructional Design. 3 credits. Prerequisites: Program major or permission of the instructor; IDT 520. 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 instruc-
tional 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.

56. Instructional Design Consulting. 3 credits. Prerequisites: Program major
or permission of the instructor; IDT 520. 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. Roleplay, response to an RFP, and discussion of
modern approaches to managing the consulting process will be primary activities in this
course.

57. Human Performance Technology. 3 credits. Prerequisites: IDT 500, 520.
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, measur-
ning results, and managing or adjusting the improvement. Job aids, electronic perfor-
mance support systems, authoring tools, and other performance technologies will be
covered.

58. Introduction to Web-Based Instruction. 3 credits. Prerequisites: Program
major or permission of the instructor; IDT 520. This course trains students to design and
develop web-based instruction, including basic web site design tools and theory, de-
sign and development of online learning with course management systems, supporting
technologies in web-based instruction, pedagogical approaches to the design and de-
velopment of online learning environments.

59. Internship in Instructional Design and Technology. 2 to 4 credits. The
internship is a culminating experience in which the student assumes responsibility for
an instructional design and technology project.

60. Special Topics in Instructional Design and Technology. 1 to 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, adap-
tive testing, intelligent tutoring systems, and hypermedia applications.

591. Readings in Instructional Design and Technology. 1 to 3 credits. Selected
readings with oral and written reports.

592. Research in Instructional Design and Technology. 1 to 3 credits. Super-
vised research in areas of student interest.

593. Directed Studies in Instructional Design and Technology. 1 to 3 credits.
Individual project work in the design and development of technology-based instruc-
tion. All projects will require a final report.

995. Scholarly Project. 2 credits. The scholarly project demonstrates critical analy-
sis and application of information and experiences gained throughout the program of
study.

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.

998. Thesis. 4 to 9 credits. The thesis is an original research project completed
under the supervision of a thesis committee.

Kinesiology

Professors: Brinkert, Caine (Chair), Johnson,
M. Short, S. Short (Graduate Program Director),
Steen and Whitehead

Program Description

The Department of Physical Education, Exercise Science and
Wellness (PXW) exists to promote lifelong participation in physical
activity, exercise, and sport for the people of North Dakota and
beyond. The mission of the Department’s graduate program in Kine-
siology is to prepare students for a variety of professional careers in
Kinesiology by providing a rigorous and dynamic curriculum which
integrates classroom work and experiential learning opportunities.

The Department of Physical Education, Exercise Science and
Wellness offers individualized programs of study that lead to the
Master of Science (thesis or non-thesis option) with a major in Kine-
siology. 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.

Admission Requirements

1. A minimum of 20 semester credits of undergraduate work in kinesiology, physical education, exercise science and
wellness, and related areas.
   a. The following undergraduate courses (or equivalents) are required:
      i. Adapted Activities Programming (PXW 404)
      ii. Exercise Physiology (PXW 402) or Biome-
         chanics (PXW 332)
      iii. Motor Learning (PXW 276) or Motor De-
          velopment (PXW 355)
      iv. Sport Psychology (PXW 440) or Sport Soci-
          ology (PXW 401)
   Note: An applicant without satisfactory undergraduate preparation may be admitted to the program, but will be
   required to remove deficiencies by completing the neces-
   sary undergraduate courses without receiving graduate credit
   for them.

2. 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 appropriate-
ness of undergraduate/professional preparation.

3. Satisfactory scores on the Graduate Record Examination (General Test).

Degree Requirements

1. A major of at least 30 (thesis) or 32 (non-thesis) credits.

2. Completion of PXW 501 (Introduction to Research in Ki-
nesiology, 4 credits); PXW 526 (Introduction to Kinesiol-
ogy Statistics, 3 credits); and PXW 561 (Critical Synthesis
and Analysis in Kinesiology, 2 credits).

3. Completion of a thesis (4-6 credits) or independent study
(2 credits).

Thesis Option

1. Establish the Faculty Advisory Committee and submit the
Program of Study by the completion of nine graduate cred-
its.

2. Complete thesis.

Non-Thesis Option

1. Select permanent advisor and submit the Program of Study
by the completion of nine graduate credits.

2. Complete independent study.

3. Pass a written and oral final comprehensive examination
administered by a committee made up of members from the
department’s graduate faculty.

Courses

501. Introduction to Research in Kinesiology. 4 credits. The study of quantita-
tive and qualitative research methods used in the field of kinesiology.

502. Evaluation in Kinesiology. 3 credits. Prerequisite: PXW 415 or consent of
the instructor. The course will deal with the determination of standards for human per-
formance in kinesiology, and the principles to apply these standards for exercise pre-
scription.

511. Theory and Practice in Administration. 2 credits. Prerequisite: PXW 341 or
consent of the instructor. A study of the knowledge, skills and insights as they relate
to planning, management and leadership necessary for effective administration of pro-
gress.

512. Theory and Practice in Sports Administration. 2 credits. Problems, poli-
cies and facilities in athletic departments with emphasis at the secondary level. Public
relations problems met and problems of interrelationships with the general curriculum.
513. Supervision. 3 credits. Prerequisites: PXW 521 or consent of the instructor. The study of the knowledge and skills necessary to supervise teaching and coaching in sport and fitness education.

514. Theory and Practice in Intramural Sports Administration. 2 credits. Study of the basic ingredients required to administer a successful intramural program.

520. Curricular Development. 3 credits. A study of processes for planning, implementing, and evaluating curriculum in physical education.

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.

523. Historical and Philosophical Foundations. 2 credits. Educational justification of various phases of the physical education, exercise science and wellness programs based on historical and philosophical evidence.

524. Adapted Activities. 3 credits. Prerequisite: PXW 404 or consent of the instructor. Theory and practice of modified activities adapted to needs, capacities and abilities of the atypical child.

525. Motor Development. 3 credits. Prerequisites: PXW 276 or PXW 355, or consent of instructor. 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.

526. Introduction to Kinesiology Statistics. 3 credits. Prerequisite: Kinesiology major or consent of instructor. 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.

529. Exercise Psychology. 3 credits. Prerequisites: PXW 440 or consent of the instructor. A research-based study of the psychological aspects that are associated with participation in exercise/physical activity. The course focuses on the use of these measurements for conducting physical fitness and wellness assessments and exercise physiology related research.

533. Motor Learning and Control. 3 credits. Prerequisite: PXW 276 or equivalent, or consent of the instructor. Study of the acquisition and control of human motor skill.

534. Sport Sociology. 3 credits. Prerequisite: PXW 401 or consent of the instructor. This course is designed to examine various sociological factors in American society and their relationship to the sport experience.

535. Advanced Exercise Physiology I. 3 credits. Prerequisites: PXW 401 or equivalent, and consent of the instructor. The focus of this course is on the mechanisms which affect the cardiovascular and pulmonary system responses at rest, during and after exercise.

536. Advanced Exercise Physiology II. 3 credits. Prerequisites: PXW 402 or equivalent, and consent of the instructor. This course is designed to examine various sociological factors in American society and their relationship to the sport experience.

537. Applied Sport Psychology. 3 credits. Prerequisite: PXW 440 or consent of the instructor. A study of psychological skill training programs for use with team and individual sports athletes.

538. Exercise in Health and Disease. 3 credits. Prerequisites: PXW 535 or consent of the instructor. 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 status (e.g., aging and pregnancy). This is a lecture course.

539. Theory and Practice of Exercise Testing. 3 credits. Prerequisites: consent of instructor. 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.

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.

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.

555. Special Topics in Kinesiology. 1 to 4 credits. Prerequisite: Consent of instructor. Investigation of special topics in the study of kinesiology not included in current departmental course offerings.

560. Seminar in Kinesiology. 1 credit. Prerequisite: Consent of the instructor. Presentations of current topics based on reviews of literature. Repeatable to 4 credits. S/U grading only.

561. Critical Synthesis and Analysis in Kinesiology. 2 credits. Prerequisite: 20 hours of graduate credit. This course is designed to provide the student with the opportunity to critically analyze and synthesize topics in kinesiology.

585. Internship in Kinesiology. 3 to 6 credits. Prerequisite: Appropriate foundation and major area coursework; consent of instructor. Professional experience and skill development through supervised placement at an approved work site (or a program) relevant to the course of study.

590. Individual Research in Kinesiology. 1 to 4 credits. Prerequisite: PXW 501 and consent of the student’s faculty adviser. Library, laboratory or field research of an approved project in Kinesiology.

592. Directed Readings in Kinesiology. 2 to 3 credits. Prerequisite: PXW 501 and consent of the student’s faculty adviser. 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).

Linguistics

Special Summer Faculty: Baart, Bickford (Chair), C. Black, H. A. Black, Clifton (Graduate Director), Headland, Karan, Levinsohn, Marlett, Meyer, Olson, Parker, Roberts, Snider, Tuggy, D.A. Weber and D.D. Weber

Program Description

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.

It is a cooperative program between UND and SIL International, and offered primarily during a nine-week summer session every year. Students are initially accepted into the program only in the summer session (when the program’s faculty members are on campus) and are normally expected to spend at least two summers enrolled in the program. (See the detailed information at: http://www.und.edu/dept/linguistics/lingma.htm.)

Admission Requirements

1. 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.

Students deficient in undergraduate credit requirements but otherwise qualifying for acceptance may use their first summer’s coursework at SIL (or 10 graduate credits in courses designated as linguistics) in lieu of the undergraduate requirement in linguistics. The foreign language requirement may be met by passing an examination in the language.

Degree Requirements

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. 4 credits for a thesis
   e. at least 6 other credits in Linguistics.

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. Alternately, 9 credits may be in a minor or in cognate courses (see the Degree Requirements section of the Graduate catalog.)

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. Students majoring in Linguistics may wish to minor in English at UND.
Students may take the linguistics courses even without applying to the M.A. program. All students who wish to take SIL courses (whether in the M.A. program or not) should apply directly to SIL each year, preferably by April 15 (April 1 for non-U.S. citizens). Application and other information is available at: http://www.und.edu/dep/linguistics/ 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@silorg) and the director of graduate studies is John Clifton (john_clifton@sil.org). Information is also available from the SIL office on campus when the courses are in session during the summer (777-0575).

Courses

503. Phonology II. 3 credits. Prerequisite: Linguistics 450, 451, or equivalent. Phono-phonological phenomena examined from a generative point of view; emphasis on cre-creation and testing of hypotheses about the phonological systems of particular languages.

504. Syntax II. 3 credits. Prerequisite: Linguistics 452. Drawing on one or more theories from the generative tradition, this course explores syntactic forms that are com-monly attested in human language. There is emphasis on the role of language universals and linguistic argumentation in arriving at analyses of language phenomena.

505. Typology and Discourse. 3 credits. Prerequisite: Linguistics 452. The course covers recent trends relating to language typology and cross-linguistic generalizations, focusing on the domains of morphosyntax, semantics and pragmatics.

506. Field Methods. 3 credits. Prerequisites: Linguistics 450 and 452 or equivalent. Recommended prerequisite: Linguistics 480. Corequisite: Linguistics 451 or equivalent. 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 hu-man languages.

507. Special Topics in Linguistics. 1 to 4 credits. Topics of current interest in linguistics. May be repeated if topic is different.

510. Semantics and Pragmatics. 3 credits. Prerequisite: Linguistics 452 or equivalent. Various dimensions of meaning on the lexical, propositional, and inter-propositional levels. Meaning is studied both as a property of linguistic expressions and as derived from contextual factors. Topics include principles of lexicography, selection restrictions, operators and their scope, illocutionary force, inference, and relations between form and meaning.

511. Translation of Texts: Theory and Practice. 3 credits. Prerequisites: Lin-guistics 510 and two years of foreign language or equivalent proficiency. Corequisite: Linguistics 510. This course is an introduction to the theory and practice of text trans-lation, emphasizing the accurate, natural and clear transference of meaning across lan-guages 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.

519. Introduction to Literacy Principles. 3 credits. Prerequisites: Linguistics 451 and 452 or equivalents. Corequisite (recommended): Linguistics 530. Introduction to literacy principles, methods, materials and programs in multilingual societies, espe-cially those involving one or more minority languages. Includes language policy and planning, reading theory, materials design, and literacy program design and implementa-tion, with special emphasis on training and assisting members of the minority lan-guage community to establish and maintain ongoing literacy programs. Intended as an introduction to the topic for field linguists who are not planning to be literacy special-ists. 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. May not be used for graduate credit on the same program of study as 520/521/522.

520. Foundational Issues of Community-based Literacy in Multilingual Societies. 3 credits. Corequisites: Linguistics 521, 522 and 530. 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 move-ments 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.

521. Literacy Program Planning and Management. 3 credits. Corequisites: Linguistics 520, 522 and 530. 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 Lexical/Inks Electronic Performance Support system and access relevant Internet resources.

522. Materials and Methods in Adult Literacy. 3 credits. Corequisites: Linguis-tics 520, 521 and 530. 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 read-ing; (d) design teacher training protocols for literacy programs; (e) design testing pro-tools for reading materials; (f) develop instructional materials for transitional literacy programs; (g) organize and direct a writers’ workshop; and (h) explain the need for post-literacy materials and how to develop these.

530. Introduction to Writing Systems. 1 credit. Corequisite: Linguistics 451 or equivalent. Introduction to the principles of designing and testing a writing system. Attention is given to linguistic, sociolinguistic, educational, psychological, political/ideological, production and implementation issues in orthographic development.

590. Directed Studies in Linguistics. 1 to 4 credits. Supervised individual study. May be repeated if the topic is different. A maximum of 6 credits may be applied to the M.A. in linguistics.

594. Research in Linguistics. 1 to 6 credits. May be repeated if topic is different.

450. Articulatory Phonetics. 2 credits.

451. Phonology I. 3 credits.

Mathematics

Professors: Bevelacqua, Collings, Dearden, Dunnigan, Gilsdorf, Halcrow, J. Iiams, M. Iiams, Khavanin, Metzger, Millsapgh (Chair and Graduate Director), Peterson, Richards, Takahashi and Zerr

Program Description

The Department offers courses leading to the M.S. (thesis and non-thesis) and M.Ed. degrees with a major in mathematics. Admission Requirements

1. The equivalent of a bachelor’s degree with a major in math-ematics. Students who have not completed the equivalent of Math 431 and Math 432, Advanced Calculus, as undergraduate will be required to do so as part of their graduate program. Students without the required degree, or equival-ent, may be admitted but will be required to satisfactorily complete undergraduate courses to make up their deficiency before advancement to Approved status.

Degree Requirements

Master of Science

1. A major of 30 (thesis) or 32 (non-thesis) credits and a major with a minor or cognate.

2. Two full graduate sequences of the five available: 512-513, 515-516, 518-519, 520-521 and 541-542.

3. At least one additional mathematics graduate course.

The remainder of the program will be determined in consultation with an advisor based on the student’s mathematical aims, interests and background. Master of Education

1. A minimum of 32 semester credits is required for the M.Ed. degree of which 16 credit hours of graduate work must be completed in mathematics, with at least 8 credits of mathemat-ics being at the 500 level or above, including 2 hours of 997, Independent Study. (See Degree Requirements for Master of Education.)

2. Must have completed, in undergraduate or graduate school, courses in algebra equivalent to Mathematics 441 and 442, a course in analysis equivalent to Mathematics 431, a course in geometry equivalent to Mathematics 409, and a course in probability and statistics equivalent to Mathematics 421.

Graduate Minor in Statistics

The requirements consist of 9 hours of which Math 421 and Math 422 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 Mathe-matics Department.
Courses

505. Seminar in Mathematics. 1 to 3 credits.

512. Modern Analysis I. 3 credits. Prerequisite: Math 432. Algebraic and 6- algebraic structures, 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.

513. Modern Analysis II. 3 credits. Prerequisite: Math 512. 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 $C_0$, bounded linear operators, and dual spaces.

515, 516. Applied Mathematics. 3 credits each. Prerequisite: Math 266 or consent of instructor. 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.

518, 519. Algebra I, II. 3 credits each. Prerequisite: Math 441 and 442. Group theory, rings and fields, vector spaces, Galois theory and finite fields.

520, 521. Topology I, II. 3 credits each. Prerequisite: Math 431. Point set topology, including metric spaces and such topics as homeomorphisms, separation axioms, compactness, connectedness, general convergence, compactification and metrizability.

541. Linear Statistical Models. 3 credits. Prerequisite: Math 422 or consent of instructor. 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.

542. Advanced Topics in Statistics and Probability. 3 credits. Prerequisite: Math 541 or consent of instructor. 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.

576. Algebra and Geometry for Middle School Teachers. 3 credits. Prerequisites: Must be a licensed K-12 teacher; college Algebra; instructor consent. Algebra and Geometry course intended for middle school teachers: a) planning to qualify to teach middle school mathematics; or b) teachers looking to enrich their content knowledge in mathematics. Topics may include: rational number system, introduction to number theory, algebraic thinking, spatial reasoning and representation, introduction to Euclidean and non-Euclidean geometry, problem solving and pedagogical issues. May not be used in Ph.D. or Master’s programs.

577. Calculus Concepts for Middle School Teachers. 3 credits. Prerequisites: Must be a licensed K-12 teacher; college Algebra; instructor consent. 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: functions, mathematical modeling, limits, continuity, differentiation, integration, and pedagogical issues. May not be used in Ph.D. or Master’s programs.

578. Probability and Statistics for Middle School Teachers. 3 credits. Prerequisites: Must be a licensed K-12 teacher; college Algebra; instructor consent. 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: probability, mathematical modeling, limits, continuity, differentiation, integration, and pedagogical issues. May not be used in Ph.D. or Master’s programs.

581, 582. Advanced Calculus. 3 credits. Prerequisite: Math 381 or consent of instructor. Advanced calculus 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: advanced calculus, mathematical modeling, limits, continuity, differentiation, integration, and pedagogical issues. May not be used in Ph.D. or Master’s programs.

589. Practicum in Middle School Mathematics. 2 credits. Prerequisites: Must be a licensed K-12 teacher; Math 576, 577 or 578; instructor consent. Teachers will use their content and pedagogical knowledge to plan lessons 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.

403. Theory of Probability. 3 credits.
405. Selected Topics in Mathematics. 1 to 3 credits.
408. Combinatorics. 3 credits.
409. Geometry. 3 credits.
412. Differential Equations. 3 credits.
415. Topics in Applied Mathematics. 1 to 3 credits.
416. Topics in Statistics. 1 to 3 credits.
421, 422. Statistical Theory. 6 credits.
431, 432. Advanced Calculus. 6 credits.
435. Theory of Numbers. 3 credits.
441. Abstract Algebra. 3 credits.
442. Linear Algebra. 3 credits.
450. Elements of Topology. 3 credits.
460. Mathematical Modeling. 3 credits.
461, 462. Numerical Analysis. 6 credits.
465. Topics in Operational Research. 3 credits.
471. Introduction to Complex Variables. 3 credits.
494, 495. Reading Course in Mathematics. Credit not to exceed 1 hour a semester and total credit not to exceed 3 hours.

Mechanical Engineering

Professors: Ames, Bandyopadhyay, Bibel, Cavalli, Grewal, Kulkarni (Chair and Graduate Director), Semke and Zahui

Program Description

The Department of Mechanical Engineering offers graduate programs leading to either the Master of Science (M.S.) or Master of Engineering (MEng) 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 MEng degree is an engineering practice-oriented degree that requires completion of an engineering design project.

The department offers combined B.S./Master’s programs that allow a student to complete a master’s degree in as little as one year beyond the bachelor’s degree. The master’s degree may be either an M.S. or MEng. See “Combined Degree Program” under the School of Engineering and Mines section for additional details.

Admission Requirements

1. Students who hold a B.S. degree in Mechanical Engineering from an ABET accredited program and have an acceptable GPA are accepted without the need for the Graduate Record Exam (GRE).

2. 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.

3. The GRE general test will be required for those applicants with undergraduate degrees from other than ABET accredited programs.

4. Students seeking admission to the M.S. program must have an overall undergraduate GPA of at least 2.75 or a GPA of at least 3.00 for the junior and senior years of their undergraduate program.

5. Students seeking admission to the MEng program must have an overall undergraduate GPA of at least 2.50 or a GPA of at least 2.75 for the junior and senior years of their undergraduate programs.

6. 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.

Degree Requirements

The minimum degree requirements will be those listed by the Graduate School. Additionally, the following requirements must be satisfied.

Master of Science

Thesis option—completion of a research project and its presentation in a thesis.

Non-thesis option—completion of an independent study.

Master of Engineering

1. Completion of a design project.

2. At least 12 credits of engineering design and at least 9 credits of engineering science, basic science and/or mathematics.

The research project, independent study, or design project may be from interdisciplinary areas such as bioengineering or environmen-
eral engineering, or they may be topics in design, manufacturing processes, vibrations, stress analysis, materials, power, fluid mechanics, heat transfer, thermodynamics, or combustion.

Course Offerings
A minimum of one 500-level course will be offered each semester. The courses will alternate between the thermal science-fluids-energy areas and the mechanics-materials-manufacturing-processes areas. All graduate students who have not completed their coursework will be required to enroll in these courses. A course will not be repeated in less than two years unless by student demand. All other courses listed will be taught on appropriate student demand.

Courses
514. Processing of Advanced Materials. 3 credits. Prerequisite: Engr 203, ME 301. Structural ceramics, metal matrix composites, superalloys are considered as advanced materials because of their high specific strength. Modulus and high temperature resistance. However, machining of these materials presents a big challenge to manufacturing engineers. The course will discuss in detail the latest achievements for cost effective machining of these materials.

523. Advanced Machine Design. 3 credits. Prerequisite: Mechanical Engineering 322 and 323. 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.

524. Deformation and Fracture. 3 credits. Prerequisites: ME 301 or consent of instructor. Aspects of elasticity theory, continuum mechanics and fracture mechanics. Fundamental relationships between material structure and engineering properties. Principles and properties of composite materials.

536. Advanced Vibrations. 3 credits. Prerequisites: Mechanical Engineering 426. Advanced vibration theory including the solutions of multi-degree of coupled systems, continuous systems, energy methods, non-linear vibrations.

595. Design Project. 3 to 6 credits. Prerequisite: Restricted to Master of Engineering students and subject to approval by the student’s advisor. A three to six credit course of engineering design experience involving individual effort and formal written report. S/U grading only.

998. Thesis. 1 to 9 credits. Development and documentation of scholarly activity demonstrating proficiency in Mechanical Engineering at the master’s level. S/U grading only.

426. Mechanical Vibrations. 3 credits.
428. Advanced Manufacturing Processes. 3 credits.
429. Intro to Finite Element Analysis. 3 credits.
446. Gas Turbines. 3 credits.
449. Internal Combustion Engines. 3 credits.
451. Heating and Air Conditioning. 3 credits.
464. Computational Fluid Dynamics. 3 credits.

574. Advanced Heat Transfer. 3 credits. Prerequisite: Mechanical Engineering 474, or consent of instructor. Advanced conductions in isotropic media in two and three dimensions steady and unsteady problems. Advanced convection inclusion solution of Prandtl Boundary layer equations. Numerical methods, Fourier series, Bessel functions, LaPlace transforms, and error functions. Radiative heat transfer.

590. Special Topics. 1 to 6 credits. Prerequisite: Departmental approval. Investigation of special topics dictated by student and faculty interests. May be repeated up to a total of 6 credits.

591. Research in Mechanical Engineering. 1 to 6 credits.

Program Description
The Department of Microbiology and Immunology offers graduate programs leading to the M.S., Ph.D., and Ph.D./M.D. degrees. Graduate study is available in a number of disciplines including cell biology, pathogenic microbiology, genetics, immunology, immunogenetics, autoimmunity, microbial physiology, molecular biology, and virology. The goals of the program are to provide scientific training and experience for careers in research and teaching in universities, clinical and research laboratories and in fields of related employment. Additional background is available in disciplines such as biochemistry, computer sciences, statistics and electron microscopy in other departments in the School of Medicine and the University.

Students rotate through each faculty member’s laboratory in their first semester of graduate study. Subsequent to this experience the student and his/her advisor are expected to choose a specific research program.

Core requirements for M.S. and Ph.D. degrees include courses in biochemistry, microbiology, molecular biology, immunology, statistics and graduate seminars. For both the M.S. and Ph.D. degrees, students are expected to carry out original research suitable for publication in a professional journal.

Master’s degree candidates are required to write a thesis and defend their research in a final oral examination. Doctoral candidates are required to successfully complete both a written and oral comprehensive examination as well as to write a dissertation and defend their research in a final oral examination.

Research Facilities
A new, modern science building and an adjacent bioinformation learning resources center which house the research laboratories, library and teaching facilities of the School of Medicine were constructed in 1994. These facilities provide a state-of-the-art environment for teaching and research. The Department of Microbiology and Immunology occupies the fourth floor of the research building. Other basic science departments in this facility include the Departments of Anatomy and Cell Biology, Biochemistry and Molecular Biology, Pharmacology, Physiology and Therapeutics. Additional resources include the Department of Pathology, the Energy and Environmental Research Center, the USDA Human Nutrition Center and the Computer Center. The proximity of these departments and facilities provides the opportunity for cooperative and collaborative research and training in the basic sciences.

Financial Assistance
Graduate students are supported by University fellowships, teaching assistantships and research assistantships. The stipends are competitive, and normally provide support for the entire calendar year and include a waiver of tuition and fees. Applications for admission are accepted throughout the year. Applications for Fall Semester should be received no later than February 15 since the awarding of financial aid for the next academic year is decided in March and early April.

Admission Requirements
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.

Student Group
The department enrolls 10-12 graduate students in its program. This departmental enrollment ensures a close association between a
faculty advisor and student for personal guidance and research training yet provides an adequate number of students for individual and group interaction. Students have the opportunity to present and participate in journal clubs, general seminars, and research seminars. All graduate students are expected to participate in teaching during their tenure in the Department.

**Degree Requirements**

**Master of Science**

1. A minimum of 30 credit hours including research and thesis
2. A grade of at least B in BIMD 500.
3. Completion of BIMD 510, 513, 515 and 516.
5. Completion of one credit each of MBio 507 and 511.
6. Completion of MBio 509.
7. Completion of two of the following (4 credits): MBio 501, 504, 508, 512 or 519.
8. An overall GPA of at least 3.0.

**Minimum course requirements as follows:**

- **BIMD 500** Cellular and Molecular Foundations of Biomedical Science .................................. 6 cr
- **BIMD 510** Basic Biomedical Statistics ...................................... 2 cr
- **BIMD 513** Seminars in Biomedical Science .................................. 1 cr
- **BIMD 515** Steps to Success in Graduate School ................................................................. 1 cr
- **BIMD 516** Responsible Conduct in Research ............................................................. 1 cr
- **MBio 507** Seminar in Microbiology .................................................. 1 cr
- **MBio 509** Immunology .............................................................. 3 cr
- **MBio 511** Microbiology and Immunology Literature ................................................... 1 cr
- **MBio 513** Research Tools .......................................................... 2 cr
- **MBio 590 and 998 Research and Thesis ............................................. 8 cr

And at least two of the following:

- **MBio 501** Molecular Virology ................................................... 2 cr
- **MBio 504** Microbial Physiology ................................................... 2 cr
- **MBio 508** Microbial Pathogenesis ................................................... 2 cr
- **MBio 512** Microbial Genetics ..................................................... 2 cr
- **MBio 519** Advanced Immunology ................................................... 2 cr

Total credits ................................................................. 30 cr

See also Departmental Guidelines and Graduate School Requirements for the M.S.

**Doctor of Philosophy**

1. A minimum of 30 credit hours including research and dissertation.
2. A grade of at least B in BIMD 500.
3. Completion of BIMD 510, 513, 515 and 516.
5. Completion of one credit each of MBio 507 and 511.
6. Completion of MBio 509.
7. Completion of four of the following (8 credits): MBio 501, 504, 508, 512 or 519.
8. An overall GPA of at least 3.0.

**Minimum course requirements as follows:**

- **BIMD 500** Cellular and Molecular Foundations of Biomedical Science .................................. 6 cr
- **BIMD 510** Basic Biomedical Statistics .................................................. 2 cr
- **BIMD 513** Seminars in Biomedical Science .................................................. 1 cr
- **BIMD 515** Steps to Success in Graduate School .................................................. 1 cr
- **MBio 507** Seminar in Microbiology .................................................. 1 cr
- **MBio 509** Immunology .............................................................. 3 cr
- **MBio 511** Microbiology and Immunology Literature ................................................... 1 cr
- **MBio 513** Research Tools .......................................................... 2 cr
- **MBio 590 and 998 Research and Thesis ............................................. 8 cr

And at least four of the following:

- **MBio 501** Molecular Virology ................................................... 2 cr
- **MBio 504** Microbial Physiology ................................................... 2 cr
- **MBio 508** Microbial Pathogenesis ................................................... 2 cr
- **MBio 512** Microbial Genetics ..................................................... 2 cr
- **MBio 519** Advanced Immunology ................................................... 2 cr

Total credits ................................................................. 90 cr

See also Departmental Guidelines and Graduate School Requirements for the Ph.D.

Qualified applicants with a M.S. degree may apply directly to the Ph.D. program. A student enrolled currently in the M.S. program may by-pass the M.S. degree and continue directly into the Ph.D. program.

**Joint Ph.D.-M.D. Degree**

See Program Requirements for Ph.D./M.D. Degree in the Degree Requirements section.

**Courses**

Courses marked with an asterisk (*) are offered in alternate years only.

**BIMD 500. Cellular and Molecular Foundations of Biomedical Science.** 6 credits. A series of lectures and discussion groups with emphasis on interrelated themes in basic biochemistry, cell biology and molecular biology. Lectures will include current and emerging areas of research, while discussion will center on methods, techniques and expansion of lecture topics. Fall semester. Prerequisites: (a) a year of organic chemistry or (b) one semester of organic chemistry plus a course in either biochemistry or cell biology, or (c) permission of the course director.

**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. Spring semester.

**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 515. Steps to Success in Graduate School.** 1 credit. A series of lectures and discussion sessions covering topics related to the development of skills and experience important for successful completion of graduate training and transition to post graduate training and employment. Students will examine a variety of issues including choosing an advisor and research topic, charting their course through graduate school, the importance of productivity, how to give a scientific presentation and write a scientific publication, applying for predoctoral grants, and planning for their careers.

**BIMD 516. Responsible Conduct of Research.** 1 credit. 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.

*501. Molecular Virology.** 2 credits. Prerequisites: Microbiology and biochemistry and/or consent of instructor. Genetics and molecular biology of animal and bacterial viruses, with emphasis on viral-host interactions, viral replication, and viral gene expression.

*504. Microbial Physiology.** 2 credits. Prerequisites: A basic course in microbiology and organic chemistry or biochemistry or consent of instructor. The course will investigate the physiology of the bacterial cell as it pertains to the processes carried out by the cell. Topics will include basic cell structure, motility, chemotaxis, uptake of nutrients, metabolism, gene regulation, evolution, cell division, differentiation, and pathogenesis. The integration of various cellular functions to sustain the living cell will be emphasized. The course will be based largely on current literature and will involve class discussions of assigned topics. In addition to gaining an understanding of the bacterial cell, students will learn to read primary literature critically and the principles involved in writing a scientific paper. Discussions will be based upon readings from the current literature.

507. Seminar in Microbiology. 1 credit. S/U grading only.

*508. Microbial Pathogenesis.** 2 credits. Prerequisite: BIMD 500 or equivalent. A detailed study of pathogenic microorganisms and the mechanisms by which they cause tissue and cell injury.

509. Immunology. 3 credits. Prerequisite: BIMD 500 or equivalent. An introduction to the fundamentals of immunology including immunohemotology, humoral and cellular response, hypersensitivity, immunodeficiency, immunogenetics, tolerance and immunopathogenesis.

511. Microbiology & Immunology Literature. 1 credit. Prerequisite: Microbiology 302 or equivalent. A series of reports of current scientific literature in Microbiology and Immunology. S/U grading only.

*512. Microbial Genetics.** 2 credits. Prerequisites: Basic courses in genetics and microbiology or biochemistry and/or consent of instructor. Genetic mechanisms in microorganisms, mutagenesis, fine structure of genetic material, genetic engineering. Selected Readings.
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 immunossay, and western blot techniques are presented. S/U grading only.

515. Advanced Topics. 2 credits. Prerequisite: Previous basic course in the area to be covered. 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.

519. Advanced Immunology. 2 credits. Prerequisite: Microbiology 509, an equivalent course, and/or permission of instructor. An advanced discussion of the genesis and regulation of innate and adaptive immune responses. Selected readings.

590. Research in Microbiology. 2 to 6 credits. Hours arranged. Advanced problems in microbiology and related fields.

591. Special Problems in Microbiology. 1 to 6 credits. Short term research projects performed under the supervision of a department faculty member. Intended to provide interested capable students with a challenge and an opportunity to conduct scientific research in microbiology. Arranged by consultation with participating faculty members.

## Music

**Professors:** Blackburn (Chair and Graduate Program Director), Blake, Christopherson, Costes, Gallo, Ingle, Keyser, Lewis, Norman, Popejoy, Rheude, Towne and Wittgraf

### Program Description

Music is offered at the University of North Dakota in the belief that it contributes to the aesthetic development of humankind. The UND Music Department seeks to provide a multi-faceted environment of excellence in which students and faculty realize their full potential as musicians and scholars.

As a learning community, we value mutual respect and cooperation and we acknowledge local roots and a global perspective.

The Music Department offers graduate programs leading to the Master of Music degree with specializations in Music Education, Performance, Pedagogy, Composition, Choral Conducting, Instrumental Conducting, and the Doctor of Philosophy degree in Music Education. The department is an accredited institutional member of the National Association of Schools of Music.

### Admission Requirements

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.

The following supplementary materials should accompany applications for the programs below:

**M.M. in Performance, Pedagogy or Conducting**

1. Audition on the major performing instrument or voice, either at UND or by tape recording of a recent live performance.
2. List of repertoire studied on the major instrument or voice or conducted.

**M.M. in Vocal Performance or Pedagogy**

1. Items listed above, plus
2. Evidence of two years’ satisfactory study of French, German, or Italian, and knowledge of the diction of all three.

**M.M. in Composition**

1. A representative sample of compositions.

**Ph.D. in Music Education**

See additional admission requirements under Education: Teaching and Learning Doctoral Program.

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 diction.

Achievement of a minimum score on the entrance examinations or completion of Music Theory Review (MUSC 501) and Music History Review (MUSC 505) is required prior to registration in Music 502 and 508.

### Degree Requirements

The program of study for the Master of Music degree must include at least 32 credit hours. The degree is available in six specializations: (1) Music Education, (2) Performance, (3) Pedagogy, (4) Composition, (5) Choral Conducting, and (6) Instrumental Conducting.

Requirements for the Ph.D. in Music Education in the table below are modeled on those described under Education: Teaching and Learning Doctoral Program.

### Residence Requirements

At the master’s level, the specializations in Conducting require at least a one-year residence. Other specializations have no residency requirement. At the doctoral level, residency requirements are modeled on those described in Education: Teaching and Learning Doctoral Program, with some flexibility according to the student’s needs and experience.

### MUSIC EDUCATION SPECIALIZATION

**Independent Study Option**

**MUSIC EDUCATION COURSES** (17 credits)

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)

**CORE COURSES** (9 credits)

MUSC 500 ... Introduction to Graduate Study ................. (3)
MUSC 502 ... Perspectives of Music Theory ................. (3)
MUSC 508 ... Perspectives of Music History ................. (3)

**ELECTIVES** (6 credits)

(from outside Music Education, may be from outside the Department of Music) .................................................. (6)

**Thesis Option**

**MUSIC EDUCATION COURSES** (19 credits)

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)

**CORE COURSES** (9 credits)

MUSC 500 ... Introduction to Graduate Study ................. (3)
MUSC 502 ... Perspectives of Music Theory ................. (3)
MUSC 508 ... Perspectives of Music History ................. (3)

**ELECTIVES** (4 credits)

(from outside Music Education, may be from outside the Department of Music) .................................................. (4)

**Performance Option**

**MUSIC EDUCATION COURSES** (15 credits)

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 (3-6 credits, may include Conducting)
MUSC 595 ...... Individual Lessons .................................... (1-4)
(Conducting students 1 credit, all others 4 credits)
MUSC 599 ...... Graduate Recital ....................................... (2)

Conducting Courses (5 credits, required for conducting students only)
MUSC 561 ...... Advanced Choral Conducting 
or
MUSC 562 ...... Advanced Instrumental Conducting .............. (2)
MUSC 521 ...... Instrumental Literature 
or
MUSC 524 ...... Choral Literature ....................................... (3)

CORE COURSES (9 credits)
MUSC 500 ...... Introduction to Graduate Study .................... (3)
MUSC 502 ...... Perspectives of Music Theory ....................... (3)
MUSC 508 ...... Perspectives of Music History ....................... (3)

ELECTIVES (2 credits)
(available outside Music Education, may be from outside the Department of Music) ................. (2)

Teacher Education Option
Prerequisite Degree: B.A., B.S., or B.M. in Music or Music Therapy
Graduate Coursework (33 credits)

MUSIC EDUCATION COURSES (9 credits)
MUSC 503 ...... Psychological Foundations of Music Learning ..................... (3)
MUSC 509 ...... Trends in Music Education ............................. (3)
MUSC 598 ...... Research in Music Education .............................. (3)

CONDUCTING COURSES (7 credits)
MUSC 561 ...... Advanced Choral Conducting ...................... (2)
MUSC 562 ...... Advanced Instrumental Conducting ............ (2)
MUSC 521 ...... Instrumental Literature 
or
MUSC 524 ...... Choral Literature ....................................... (3)

METHODS COURSES (6 credits)
MUSC 440 ...... Elementary Music Methods .......................... (3)
MUSC 441 ...... Secondary Music Methods ............................ (3)
MUSC 599 ...... Graduate Recital ....................................... (2)

MUSIC CORE COURSES (9 credits)
MUSC 500 ...... Introduction to Graduate Study in Music ........... (3)
MUSC 502 ...... Perspectives of Music Theory ....................... (3)
MUSC 508 ...... Perspectives of Music History ....................... (3)

Additional Undergraduate Coursework to Fulfill Licensure Requirements (46-48 credits):
MUSC 140 (2-5 credits), 150 (voice and/or guitar), 180, 242 (choral specialization), 340, 423, 427, 444 (choral), and 445 or 446.
* Available via Correspondence Study

All students must demonstrate keyboard proficiency equivalent to level 3; 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 graduate school academic policies.
MUSC 539 ..... Advanced Counterpoint ......................... (2)
ELECTIVES (5 credits) ................................................. (5)
For those in the composition concentration, the final project in composition replaces an independent study.

CHORAL CONDUCTING SPECIALIZATION

CONDUCTING COURSES (13 credits)
MUSC 561 ..... Advanced Choral Conducting .................... (2)
MUSC 562 ..... Advanced Instrumental Conducting .......... (2)
MUSC 595 ..... Individual Lessons (Conducting) ............. (2)
MUSC 599 ..... Graduate Recital (Conducting) ................ (2)
MUSC 524 ..... Choral Literature .................................... (3)
MUSC 997 ..... Independent Study .................................... (2)

CORE COURSES (9 credits)
MUSC 500 ..... Introduction to Graduate Study ................ (3)
MUSC 502 ..... Perspectives of Music Theory ................. (3)
MUSC 508 ..... Perspectives of Music History ................ (3)

OTHER STUDIES (7 credits)
MUSC 594 ..... Individual Lessons (Voice) ....................... (2)
MUSC 580 ..... Choral Ensemble Performance ................... (2)
MUSC 551 ..... Vocal Pedagogy I ................................ (3)
ELECTIVES ................................................................. (3)

INSTRUMENTAL CONDUCTING SPECIALIZATION

CONDUCTING COURSES (13 credits)
MUSC 562 ..... Advanced Instrumental Conducting .......... (2)
MUSC 561 ..... Advanced Choral Conducting .................... (2)
MUSC 595 ..... Individual Lessons (Conducting) ............. (2)
MUSC 599 ..... Graduate Recital (Conducting) ................ (2)
MUSC 521 ..... Instrumental Literature ............................ (3)
MUSC 997 ..... Independent Study .................................... (2)

CORE COURSES (9 credits)
MUSC 500 ..... Introduction to Graduate Study ................ (3)
MUSC 502 ..... Perspectives of Music Theory ................. (3)
MUSC 508 ..... Perspectives of Music History ................ (3)

OTHER STUDIES (4 credits)
MUSC 594 ..... Individual Lessons (Instrumental) .......... (2)
MUSC 570 ..... Instrumental Ensemble Performance ........ (2)
ELECTIVES (6 credits) ................................................... (6)

PH.D. IN MUSIC EDUCATION

MUSIC CORE
MUSC 500 ..... Introduction to Graduate Study in Music ...... (3)
MUSC 502 ..... Perspectives of Music Theory ................. (3)
MUSC 508 ..... Perspectives of Music History ............... (3)

MAJOR AREA

MUSIC EDUCATION COMPONENT
MUSC 503 ..... Psychological Foundations of Music Learning ..................................................... (3)
MUSC 507 ..... Foundations of Music Education ............... (3)
MUSC 999 ..... Dissertation in Music Education .................. (10-15)
Music Electives (other studies in Music) ......................... (7-17)

TEACHING AND LEARNING CORE (minimum 12 credits)
T&L 539 ..... College Teaching .................................. (3)
T&L 545 ..... Adult Learners ....................................... (3)
T&L Core Electives (selected from T&L list in consultation with adviser) ............................................ (6)

FOUNDATIONS OF EDUCATION
EFR 500 ..... Foundations of Educational Thought .......... (3)
MUSC 503 ..... Psychological Foundations of Music Learning (listed above) ......................... (3)
MUSC 507 ..... Foundations of Music Education ............... (3)

SCHOLARLY TOOLS IN EDUCATION
Option 1: Qualitative Emphasis Option
EFR 510 ..... Qualitative Research Methods ................. (3)
EFR 520 ..... Advanced Qualitative Research Methods ...... (3)
EFR 516 ..... Statistics II ............................................. (3)
MUSC 598 ..... Research in Music Education ................. (3)

SCHOLARLY TOOLS OPTIONS
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)

SCHOLARLY TOOLS OPTIONS
Option 3: Tests and Measurements Option
EFR 511 ..... Curriculum Evaluation ............................ (3)
EFR 512 ..... Educational Tests & Measurements ............. (3)
EFR 516 ..... Statistics II ............................................. (3)
MUSC 598 ..... Research in Music Education ................. (3)

Courses

500. Introduction to Graduate Study in Music. 3 credits. A course covering bibliography and methodology in the principal areas of research in music.
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.
502. Perspectives in Music Theory. 3 credits. Prerequisites: MUSC 501 or passing grade on placement examination. The study of formal systems in music through selected musical works.
504. Seminar in Music. 1 to 4 credits. Seminars concerning various topics of interest to the faculty and students.
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 independent preparation. Credit does not count toward fulfillment of 32-hour minimum. Music grade requirements. May be waived by examination.
506. Advanced Composition. 1 to 4 credits. The composition and performance of original works in selected instrumental and vocal media. May be repeated without limitation.
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.
508. Perspectives of Music History. 3 credits. Prerequisites: MUSC 500 and MUSC 505, or passing grade on placement examination, or instructor’s permission. A course on various topics on the history and literature of music and related musicological fields. This course may require preparation and delivery of a substantial research paper on an appropriate topic. Repeatable when topics vary.
509. Trends in Music Education. 3 credits. An overview of historical and contemporary trends in music education.
521. Instrumental Literature. 3 credits. The study of instrumental music literature through scores and recordings.
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.
523. Keyboard Literature. 3 credits. The study of keyboard literature through scores and recordings.
Nursing

Professors: C. Anderson, J. Anderson, Chae, Covington (Dean), Evanson, Gragert, Guido (Graduate Program Director), Heuer, Ide, Lindseth, Melland, Morris, Rudel, Seal, Wright and Yurkovich

Program Description

The College of Nursing offers graduate programs leading to the Ph.D. or the Master of Science (M.S.) degree with a major in nursing. Information on any newly approved programs of study since the printing of this catalog will be available on the College of Nursing web site at: www.nursing.und.edu/.

Doctor of Philosophy in Nursing

The purpose of the program is to prepare nurses for research and faculty roles with a research emphasis on care of vulnerable and diverse populations. The program is designed with both post-baccalaureate and post-master’s entry points. Nurses who have baccalaureate degrees in nursing, but have master’s degrees in other fields, will be eligible for advanced placement in the program.

Admission Requirements

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 2.75 for all undergraduate work or a GPA of at least 3.00 for the junior and senior years of undergraduate work (based on A=4.00).
3. A cumulative GPA of 3.5 or above in graduate coursework.
4. Graduate Record Examination or Miller’s Analogy Test scores.
5. Completion of a statistics course.
6. A three to five 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. A minimum TOEFL score of 550 on paper-based test or 213 on computer-based test for all applicants whose native language is not English.
11. An interview will be required for applicants meeting these basic admission requirements.

Note: Applicants with earned master’s degrees from accredited schools may qualify for up to 36 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 must complete a minimum of 90 semester credits of post-baccalaureate work, including an original dissertation. These credits must be distributed as follows:
1. Scholarly Tools for the Ph.D. (9-12 credits). Courses in statistics and/or qualitative analytical approaches.
2. Theory and Research (18 credits). N570; N571; N573; N574; and both a 3 credits of coursework in theory and research selected by the student in consultation with the student’s faculty advisory committee.
selected in consultation with the student’s faculty advisory committee.

4. Elective Support (15 credits). 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.

5. Functional Component (9-12 credits). Courses will be selected to develop a thrust as an educator. Students with no teaching experience will be required to complete a teaching residency.

6. Dissertation. (18 credits including 3 credits of dissertation seminar). As a part of N573, Research Grantsmanship, students will be required to develop and submit an NRSA pre-doctoral fellowship application or equivalent.

7. Comprehensive Examination. Students must successfully complete a written and oral comprehensive examination prior to advancement to candidacy and approval of the dissertation proposal.

8. Final Examination. A final examination will be scheduled and administered according to the rules of the graduate school.

9. All doctoral nursing courses taken at the University of North Dakota College of Nursing must be completed with a grade of “B” or better. An individual course may not be taken more than twice.

10. All nursing courses taken at the master’s level that become part of the student’s doctoral program of study must be achieved with a grade of “B” or better.

Residency

Students will be required to attend two consecutive semesters on the UND campus.

Transfer Credit

A maximum of 36 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 post-master’s coursework.

Awarding of Master’s Degree

Students who entered the Ph.D. program without a master’s degree in nursing may apply for the M.S. with a major in nursing upon completion of 46 credits of coursework that includes N500, N525/526, N530, N510, N511, N544, N545, N555 or N566 and completion of either a thesis, the non-thesis project, or the doctoral comprehensive examination.

Master of Science

The master of science program offers six areas of specialization:

1. Nurse Anesthesia
2. Clinical Nurse Specialist in Nursing Therapeutics
3. Family Nurse Practitioner (FNP)
4. Health Administration in Nursing
5. Psychiatric and Mental Health Nursing
6. Nurse Education

Check with the department or the College of Nursing website at: www.nursing.und.edu for implementation dates for the following specializations:

7. Advanced Diabetes Management Clinical Nurse Specialist
8. Advanced Diabetes Management Nurse Practitioner
9. Gerontology Nursing Clinical Nurse Specialist

10. Gerontology Nursing Nurse Practitioner
11. Public/Community Health Clinical Nurse Specialist

Admissions to the Health Administration and Clinical Nurse Specialist in Nursing Therapeutics Specializations are currently on hold; the moratorium to admissions for these specializations was passed by the Faculty Organization on December 1, 2006 and submitted to the University of North Dakota Graduate School in early January 2007.

The program is targeted to prepare advanced practice nurses in areas of clinical specialization, or as nurse practitioners, nurse educators or nurse administrators; and to expand the scientific knowledge for nursing practice through research. The entire 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) for Nurse Anesthesia Education Programs.

Admission Requirements

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. A minimum GPA of 3.00 for the last two years of undergraduate study.
   b. For the nurse anesthesia program, the 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. A minimum of one year of experience as a registered nurse.
6. Additional requirements for Nurse Anesthesia are: an undergraduate course in biochemistry (Biochemistry 301 or equivalent), an undergraduate College Algebra course (or equivalent); one year of critical care nursing experience (two years are preferred), and a successful interview.
7. An additional requirement for the Family Nurse Practitioner and the Psychiatric and Mental Health specializations is completion of a successful interview.
8. Meet current health and immunization requirements of the College of Nursing before being permitted to enroll in a clinical nursing course.

Applications will be considered as they are completed except for Nurse Anesthesia, which must be received by October 1. Priority is given to those who apply to the Family Nurse Practitioner specialization by January 15. Students anticipating full-time study should plan to start their course of study in the fall.

General Nursing Admission

Those students selecting nursing as their major area of concentration will be assigned a nursing advisor and may take up to 24 credit hours of coursework that will transfer once they have selected a nursing specialization. These 24 credit hours are limited to the following courses:

N500 .. Theories and Concepts in Nursing ....................... (3)
N501 .. Complementary Health Care Therapies ............... (3)
N510 .. Advanced Physiology/Pathophysiology I .......... (3)
N511 .. Advanced Physiology/Pathophysiology II ......... (3)
N526 .. Ethical, Legal, and Health Policy Issues .......... (3)
N530 .. Research Design and Methods in Nursing ............ (3)
N532 .. Family Nursing: Theory, Research and Practice .. (3)
N556 Epidemiology .................................................. (3)

Total Credits .................... (24)
**Degree Requirements**

Thesis or the non-thesis options are available for all specializations. The thesis option requires completion of four credits of 998. The non-thesis option requires completion of four project-related credits, including 997 (two credits) and two credits of 590, 591, nursing electives, and/or electives in a related field. There is no residency requirement.

**Nurse Anesthesia** requires completion of 500; 504; 506; 507; 510; 511; 517; 520; 521; 527; 530; 597; and BIMD 510 and the 4 thesis or directed study and independent study-related credits. Students complete 31 credits of 597 (Advanced Clinical Practicum) to comply with accreditation standards for supervised practice hours in anesthesia nursing.

**Clinical Nurse Specialist in Nursing Therapeutics** requires completion of 500; 510; 511; 526; 530; 535; 539; 544; 545; 551; 555 and 586; 6 credits of electives; and the 4 thesis or Independent Study-related credits.

**Nursing Education Specialization** requires completion of 500; 526; 530; 566; 567; 568; 569; 14 credits of Nursing support courses and the 4 thesis or Independent Study-related credits.

**Family Nurse Practitioner** requires completion of 500; 510; 511; 523; 526; 530; 532; 534; 535; 536; 539; 555; 556; 586; 597; and the 4 thesis or independent study-related credits. Students complete 14 credits of 597, Advanced Clinical Practicum to comply with National Organization of Nurse Practitioner Faculty (NONPF) guidelines for supervised practice hours.

**Health Administration in Nursing** requires completion of 500; 530; 562; PSCI 552; PSCI 593; PSCI 551; Econ 575; 8 credits of cognate electives; and 4 thesis or independent study-related credits.

**Psychiatric and Mental Health Nursing - CNS Track** requires completion of 500; 526; 530; 540; 541; 542; 555; 561; 586; COUN 510; COUN 518 or 533; 7 hours of electives; and 4 hours of thesis or independent study related credits.

**Psychiatric and Mental Health Nursing - NP Track** requires completion of N500; N510; N511; N526; N530; N535; N539; N540; N541; N542; N555; N561; N586; COUN 510; COUN 518 or 533; 4 hours of electives; and 4 hours of thesis or independent study related credits.

**Advanced Diabetes Management Clinical Nurse Specialist** requires completion of 500, 510, 511, 526, 530, 535, 539, 543, 551, 556, 552, 554, 563, 572, 586, 597, and 4 thesis or directed study and independent study-related credits. Students complete 7 credits of N597 to comply with certification standards.

**Advanced Diabetes Management Nurse Practitioner** requires completion of 500, 510, 511, 523, 526, 530, 532, 534, 535, 536, 539, 543, 556, 553, 554, 563, 586, 597, and 4 thesis or directed study and independent study-related credits. Students complete 14 credits of N597 to comply with certification standards.

**Gerontology Nursing Clinical Nurse Specialist** requires completion of 500, 510, 511, 526, 528, 529, 530, 535, 539, 555, 552, 554, 563, 567, 586, 597, and 4 thesis or directed study and independent study-related credits. Students complete 14 credits of N597 to comply with certification standards.

**Gerontology Nursing Nurse Practitioner** requires completion of 500, 510, 511, 526, 528, 529, 530, 535, 539, 553, 554, 556, 563, 586, 597, and 4 thesis or directed study and independent study-related credits. Students complete 14 credits of N597 to comply with certification standards.

**Public/Community Health Clinical Nurse Specialist** requires completion of 500, 523, 526, 530, 546, 547, 548, 549, 550, 552, 554, 556, 563, 572, and 4 thesis or directed study and independent study-related credits. Students compete in excess of 500 clinical hours to comply with certification standards.

1 Admissions to the Health Administration and Clinical Nurse Specialist in Nursing Therapeutics Specializations are currently on hold; the moratorium to admissions for these specializations was passed by the Faculty Organization on December 1, 2006 and submitted to the University of North Dakota Graduate School in early January 2007.

**Certificates in Nursing**

Five post-master’s certificate programs are offered including the Family Nurse Practitioner Certificate, the Nurse Anesthesia Certificate, the Psychiatric and Mental Health Clinical Nurse Specialist Certificate, the Psychiatric and Mental Health Nurse Practitioner Certificate and the Nurse Education Certificate. The certificate programs are offered to nurses with master’s degrees in nursing who are seeking additional career options.

**Admission Requirements**

1. Master's degree in nursing.
2. Licensure as a registered nurse in North Dakota.
3. Additional requirements for Nurse Anesthesia are: an undergraduate course in biochemistry (Biochemistry 301 or equivalent), an undergraduate college algebra course (or equivalent); one year of critical care nursing experience (two years preferred), and a successful interview.
4. An additional requirement for the Family Nurse Practitioner and the Psychiatric and Mental Health specialization is completion of a successful interview.

**Family Nurse Practitioner**

A total of 45* or 46* 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:

N510 .... Advanced Physiology/Pathophysiology I ........... 3 credits
N511 .... Advanced Physiology/Pathophysiology II ......... 3 credits
N523 .... Health Promotion ........................................... 3 credits
N532 .... Family Nursing: Theory, Research & Practice ... 3 credits
N534 .... Specialization I: Health Conditions ............... 3 credits
N535 .... Drug Therapy I ................................................. 2 credits
N536 .... Specialization II: Health Conditions ............. 4 credits
N539 .... Drug Therapy II ................................................ 2 credits
N555 .... Role Dimensions: Seminar and Practicum* ...... 3 credits
N556 .... Epidemiology .................................................... 3 credits
N586 .... Advanced Health Assessment ....................... 3 credits
N597 .... Practicum I ..................................................... 4 credits
N597 .... Practicum II .................................................... 5 credits
N597 .... Practicum III .................................................. 5 credits
Total Credits ............................................................. 45-46 credits

* Students who have previously completed N555 will enroll in N590, Directed Study for 2 credit hours.

**Nurse Anesthesia**

A total of 57* credits is required for the Nurse Anesthesia Certificate. These courses meet the requirements of the Council on Accreditation for Nurse Anesthesia Educational Programs.

N504 .... Advanced Pharmacology I ............................... 3 credits
N506 .... Advanced Pharmacology II ............................. 3 credits
BIMD 510 Basic Biomedical Statistics* ...................... 2 credits
N507 .... Anesthesia Seminar & Clinical Practicum I ........ 4 credits
N510 .... Advanced Physiology/Pathophysiology I ........... 3 credits
N511 .... Advanced Physiology/Pathophysiology II ........... 3 credits
N517 .... Anesthesia Seminar & Clinical Practicum II ....... 4 credits
N520 .... Professional Role Development for Nurse Anesthesia ........................................... 3 credits
N521 .... Foundations of Anesthesia Practice ................. 2 credits
N527 .... Anesthesia Seminar & Clinical Practicum III ....... 4 credits
N597 .... Advanced Clinical Practicum .......................... 31 credits

Total Credits ........................................................ (60-62 credits

* Students who have completed a graduate level statistics course are not required to take BIMD 510.

Psychiatric and Mental Health Clinical Nurse Specialist

A total of 27 credits is required for the Psychiatric and Mental Health Clinical Nurse Specialist Certificate. These courses meet the requirements of the American Nurses Credentialing Center. The following courses are required:

N540 ..... APMH Promotion Prevention ...................... (6)
N541 ..... APMH Rehab Recovery ................................. (7)
N542 ..... Psychopharm Neuropsychology ..................... (3)
N555 ..... Role Dimensions of Advanced Nursing
Practice: Seminar and Practicum ................................. (3)

N561 ..... APMH Practice Overview ............................ (1)
N586 ..... Advanced Health Assessment ....................... (3)
COUN 510 ..... Counseling Methods ............................ (3)
COUN 518 ..... Group Dynamics ................................. (3)
COUN 518 ..... Group Dynamics ................................. (3)
or
COUN 533 ..... Couples and Group Counseling ................ (3)

Total credits ..................................................... (29)

Psychiatric and Mental Health Nurse Practitioner

A total of 37 credits is required for the Psychiatric and Mental Health Nurse Practitioner Certificate. These courses meet the requirements of the American Nurses Credentialing Center. The following courses are required:

N510 ..... Advanced Physiology/Pathophysiology I .......... (3)
N511 ..... Advanced Physiology/Pathophysiology II ......... (3)
N535 ..... Drug Therapy I for Advanced Nursing
Practice: Common Health Conditions ........................ (2)
N539 ..... Drug Therapy II for Advanced Nursing
Practice: Common Health Conditions ........................ (2)
N540 ..... APMH Promotion Prevention ...................... (6)
N541 ..... APMH Rehab Recovery ................................. (7)
N542 ..... Psychopharm Neuropsychology ..................... (3)
N555 ..... Role Dimensions of Advanced Nursing
Practice: Seminar and Practicum ................................. (3)

N561 ..... APMH Practice Overview ............................ (1)
N586 ..... Advanced Health Assessment ....................... (3)
COUN 510 ..... Counseling Methods ............................ (3)
COUN 518 ..... Group Dynamics ................................. (3)
or
COUN 533 ..... Couples and Group Counseling ................ (3)

Total credits ..................................................... (29)

Nurse Education

A total of 10 credits is required for the Nurse Education Certificate. The following courses are required:

N566 ..... Curriculum Development ............................ (3)
N567 ..... Teaching Strategies ..................................... (2)
N568 ..... Teaching Practicum ..................................... (2)
N569 ..... Assessment and Evaluation ........................... (3)

Total credits ..................................................... (10)

Courses

500. Theories and Concepts in 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.

501. Complementary Health Care 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.

504. Advanced Pharmacology I. 3 credits. Prerequisite: Admission to Nurse Anesthesia Specialization. Pharmacodynamics and pharmacokinetics, with a focus on clinical anesthetic practice. Physiologic systems and drug classifications are used; emphasis on therapeutic use, side effects, drug interactions, and contraindications of drugs used for intravenous anesthetic induction, inhalation, and balanced anesthesia maintenance. Pediatric and geriatric variations will be addressed.


507. Anesthesia Seminar & Clinical Practice. 4 credits. Prerequisite: Admission to Nurse Anesthesia Specialization. A study of the basic principles of anesthesia practice, related physical, chemical and pharmacological concepts and an introduction to pathophysiological principles applied to problems encountered in the surgical/anaesthetic setting. Analysis, integration, and utilization of research to improve practice is emphasized. Includes four hours of clinical lab experience weekly.

510. Advanced Physiology/Pathophysiology I. 3 credits. Prerequisite: Admission to graduate study. 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.

511. Advanced Physiology/Pathophysiology II. 3 credits. Prerequisites: N510 or consent of instructor. Continuation of N510. Physiologic and pathophysiologic functions of the human body and its organ systems, both separately and integrated in whole activities.

517. Anesthesia Seminar & Clinical Practice II. 4 credits. Prerequisites: N507. Advanced anesthesia principles are applied to the geriatric, pediatric, and obstetrical patients as well as to specialty surgery patients. Various regional anesthesia techniques are discussed and studied to provide the opportunity to observe and study important anatomical structures in the cadaver lab. Analysis, integration, and utilization of research to improve practice is emphasized. Students are introduced to the clinical setting spending approximately 20 to 24 days at their assigned clinical site.

520. Professional Role Development for Nurse Anesthesia. 3 credits. Prerequisite: Admission to the Nurse Anesthesia Specialization. Corequisite: NURS 500. The focus of this course is on the identification and analysis of the professional components of nurse anesthesia practice, emphasizing role development, medical, ethical and legal responsibilities, scope of practice and standards of care. Other areas that will be explored include quality assurance, the legislative process, credentialing, reimbursement, professional organization, conflict resolution and analyzing complex practice models. Overview of the history of nurse anesthesia practice as well as in-depth analysis of current trends and issues affecting the delivery of anesthesia services are included in the course content.

521. Foundations of Anesthesia Practice. 2 credits. Prerequisite: Admission to the Nurse Anesthesia Specialization. The focus of this course is on presenting to the nurse anesthesia student an opportunity to learn about applied chemical, physical, and biochemical concepts related to the practice of anesthesia. In addition, students will be oriented to the chemical and physical laws which are basic to the understanding and use of the anesthesia machine and related equipment.

523. Health Promotion through the Lifespan. 3 credits. Prerequisites: N510, 556, 586 or consent of instructor. Paradigms in health promotion, health detection and disease prevention across the lifespan are used in the synthesis of theory and research-driven primary care interventions. A clinical/laboratory component is included.

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.

527. Anesthesia Seminar and Clinical Practice III. 4 credits. Prerequisites: N517. The course includes a detailed investigation and analysis of anesthetic management of patients with complex co-existing diseases. Exploration and determination of various anesthetic care modalities to optimize patient care and safety are considered. Analysis, integration, and utilization of research to improve practice is emphasized. An extensive clinical experience component is included.

528. Gerontology Nursing Problems I. 3 credits. This course focuses on a review of basic gerontology content as well as health promotion, diagnosis and treatment of selected health problems. Application of theory and research to advanced practice roles and policy development is examined throughout the course.

529. Gerontology Nursing Problems II. 3 credits. Prerequisite: NUR 528. This course will focus on a continuation of Gerontology Nursing Problems I with the health promotion, diagnosis and treatment of selected health problems of the older client. Application of theory and research to advanced practice roles and policy development is examined throughout the course.

530. Research Design and Methods in Nursing. 3 credits. Prerequisite: NURS 500 or consent of instructor. Corequisite: NURS 500. Core course focused on examining the research process in nursing, critiquing nursing research, and writing a research proposal. Knowledge of statistics is essential.

532. Family Nursing: Theory, Research and Practice. 3 credits. Theoretical and scientific foundations for advanced practice nursing care for the family-as-a-unit in health and illness across the lifespan.

533. Specialization in Family Nurse Practitioner I: Management of Health Conditions: Primary Care. 3 credits. Prerequisite: NS23. Clinical decision-making skills are developed in the diagnosis and management of acute and chronic health conditions throughout the lifespan. Health promotion, health protection, disease prevention, health maintenance, and restoration are emphasized.

534. Specialization in Family Nurse Practitioner II: Management of Health Conditions: Advanced Practice. 2 credits. Prerequisite: NUR 533. Theoretical and scientific foundations for advanced practice nursing care for the family-as-a-unit in health and illness across the lifespan.
531. Case Management for Health Care. 3 credits. This interdisciplinary course provides an introduction to case management in health care. Students learn the fundamentals of case management techniques to broaden and strengthen the role of the provider in health care.

542. APMH Practice Prevention. 6 credits. Prerequisites or Corequisites: N500, 526, 530, 542, 555, and 6 credit hours in psychopharmacology. The course focuses on advanced assessment, client-nurse relationship, and selected therapeutic interventions. Client care is focused on prevention of illness and promotion of health in selected populations. Application of theory and research to advanced practice roles and policy development is examined throughout the course.

541. APMH Practice. 7 credits. Prerequisite: NS40. The focus of this course is on health maintenance of selected client groups with a particular emphasis on psycho-pathology and the application of related treatment modalities. Application of theory and research to advanced practice roles and policy development will build on required core and specialization courses.

542. Psychopharmacology. 3 credits. The course provides the advanced practice nurse with the knowledge and skills necessary to effectively manage psychopharmacology in practice. Content covered in the course includes antidepressants, antipsychotics, anxiolytics, mood stabilizers, hypnotics, and medications for attention deficit/hyperactivity disorder and dementia. Electroconvulsive therapy as a major psychiatric intervention will be discussed.

543. Advanced Diabetes Management. 2 credits. Prerequisites: NURS 510 and 511. This course provides the student with the opportunity to obtain theoretical knowledge on diabetes management across the lifespan. The course focuses on the integration of theoretical knowledge into practice in diabetes management.

544. CNE in Nursing Therapeutics I. 4 credits. Prerequisites and corequisites: N500, 526, 530, 535, and 539. This course focuses on clinical nurse specialists’ care of clients in diverse clinical settings, both acute and community-based. Developmental, physiological, and psychosocial concepts, theory, and research findings are used to assess and plan care for vulnerable individuals, families, and populations. Analysis, integration, and utilization of research findings to improve clinical practice are emphasized.

545. CNE in Nursing Therapeutics II. 4 credits. Prerequisites: NS54. The major focus of this course is the application of appropriate theories, models, and principles in nursing intervention and evaluation of care for vulnerable clients in multiple settings to achieve optimal health and functioning. The course builds on the concepts explored in Nursing Therapeutics I and includes advanced therapeutic concepts and principles.

546. Advanced P/CHN I. 4 credits. Prerequisites: NURS 500, 523, 556. Corequisite: NURS 530. This course introduces concepts that are foundational to advanced P/CHN practice and population health. The community assessment process and program planning and implementation are a major focus of the course. Evidence-based P/CHN interventions at the individual/family, community, and systems levels are analyzed.

547. Advanced P/CHN Practicum I. 4 credits. Prerequisite or Corequisite: Advanced P/CHN I. The focus of this course is on application of foundational concepts of advanced P/CHN practice. Students will conduct a community assessment and based upon the analysis of the assessment, develop a population health program plan that will address the concerns identified in the assessment and incorporate evidence-based P/CHN interventions. Written and oral communication skills are emphasized.

548. Advanced P/CHN II. 3 credits. Prerequisites: NURS 530, 546, 547 and 572. This course focuses on the leadership role of advanced P/CHN practice. Public health and advanced practice educational 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 to advanced P/CHN leadership in rural areas and in disaster/emergency preparedness and management are discussed.

549. Advanced P/CHN Practicum II. 7 credits. Prerequisite: NURS 548. Advanced P/CHN II. This course provides a capstone experience in advanced P/CHN practice. Students are expected to integrate knowledge from all of their previous coursework into an applied practice experience in population health.

550. Global Public Health Issues. 4 credits. Prerequisite: NURS 556. 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 issues as a public health issue and the global impact of AIDS.
and principles important to nursing when doing research, planning health care, developing health policy, and teaching in this area.

573. Research Grantmanship. 3 credits. Prerequisite: N571. Pre- or corequisites: N574 and N575; graduate level statistics course or consent of instructor. This course integrates the scientific and practice aspects of research, resulting in the development of a pre-doctoral research grant proposal.

574. Quantitative Nursing Methods. 3 credits. Prerequisites: EFR 516 or Avit 503 or consent of instructor. The underlying purpose of this course is to provide learning experiences which give advanced practice nurses the opportunity to acquire knowledge and the skills necessary to apply quantitative research methods in nursing. The course features presentations on creative and substantial applications of established methodologies and effective research techniques and strategies within the quantitative paradigm.

575. Qualitative Research Methods in Nursing. 3 credits. Prerequisite: Admission to the doctoral program or consent of instructor. Examination and analysis of qualitative research designs with particular emphasis on approaches relevant to problems in nursing or other health-related fields. Students will carry out a qualitative research project.

576. Ethical and Policy Issues. 3 credits. Prerequisite: Admission to doctoral program or consent of instructor. This course builds on ethical and health policy issues developed at the master’s level, concentrating on the various perspectives of personhood as they influence the ethical and health policy issues of diverse and vulnerable populations. Students will evaluate how nursing ethics are applied on interdisciplinary, decision-making models and consider the appropriateness of selected ethical principles and implemented health policies.

579. Dissertation Seminar. 1 credit, may be repeated for up to 4 credits. Prerequisite: Advancement to candidacy for the doctoral degree. A series of presentations and discussions of doctoral student research, literature reviews, and current issues in nursing is presented in a seminar format. S/U grading.

585. Advanced Nursing Across the Lifespan. 3 credits. Prerequisite: Completion of an undergraduate course in health assessment techniques and Nurs 510 or its equivalent or consent of instructor. A theory and research-based approach will be used to present methodologies for graduate student performance of health histories, developmental assessments, and physical/psychological assessments of individuals across the lifespan. Communication and interviewing techniques for advanced nursing practice are applied. A clinical/laboratory component is included.*

587. Introduction to Computer Technology in Advanced Practice Settings. 1 credit. Prerequisites: Admission to Family Nurse Practitioner Specialization. This course is an overview of electronic information related to nurse practitioners. The focus of the course is the use of computer and associated technology-based health applications to support clinical and educational decision making.

590. Directed Studies. 1 to 3 credits. Prerequisite: Consent of instructor. 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.

591. Readings in Nursing. 1 to 3 credits. Prerequisite: Consent of instructor. Readings in selected nursing/health care topics with written and/or oral reports.

597. Advanced Clinical Practicum. 1 to 12 credits/repeatable to 32. Prerequisite: Completion of first year Anesthesia Nursing or Family Nurse Practitioner coursework. This clinical practicum course provides the student with the opportunity to obtain extended clinical experience in the area of specialization. The course is based on the integration of theoretical knowledge into clinical practice. S/U grading only.*


998. Thesis. 4 credits.

999. Dissertation.

* These courses include a clinical and/or laboratory component.

Occupational Therapy

Professors: Atkinson, Bass, Byram-Hanson, Fox (Graduate Program Director), Haskins, Janssen, Jedlicka (Chair), Lamborn, Stube (TMOT Graduate Director) and Zimmerman

The Occupational Therapy Department offers a five and a half-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. For information regarding the program, the website is: www.med.und.nodak.edu/depts/ot/home.htm.

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 4720 Montgomery Lane, PO Box 31220, Bethesda, Maryland, 20824-1220. All basic professional programs must comply with the Standards for an Accredited Educational Program for the Occupational Therapist, 1998. Graduates of the program will be eligible 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.

The Department will provide reasonable accommodation to qualified students with disabilities (see Disability Support Services in this catalog for accommodation process or on line at: www.und.edu/depts/dss/).

A satellite professional level MOT program is available at Casper College, Casper, WY. Tuition and other information regarding the program is available by contacting the Occupational Therapy Department at Casper College, Casper, WY, telephone 307-268-2613. Wyoming residents wishing to contact the UND OT Department may call 1-888-699-0006.

Pre-Occupational Therapy Requirements

The student spends the first two years as a pre-major at the University of North Dakota to complete the pre-professional program. In the spring of the sophomore year when the student is completing the required courses as listed in the first two years, he/she must make written application for admission to the professional occupational therapy program. The CLEP in natural sciences will not meet Biology and Chemistry requirements in Occupational Therapy. Students should carefully check all CLEP exams for potential acceptance at UND. A student must have a least a C in each science, English composition, and all occupational therapy courses. A student must satisfactorily complete OT courses and maintain an appropriate GPA each semester in order to be eligible to enroll for the next semester.

I. General Education Requirements (see University GER listings)

II. The following courses are required to be taken prior to professional program:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>Engl 110, 120</td>
<td>125 &amp; Comm 110 ...Communications ................. (9)</td>
</tr>
<tr>
<td>Biol 150/150L or 151/151L.......General Biology (lab) .............. (4)</td>
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<tr>
<td>Chem 115/115L .... Introductory Chemistry (lab) or 121/121L ...... General Chemistry I (lab) ........ (4)</td>
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<tr>
<td>Math 103 ........... College Algebra or Math 104 ...... Finite Mathematics ............... (3)</td>
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<tr>
<td>Psych 111 ........ Introduction the Psychology .... (3)</td>
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<tr>
<td>Psych 241 ........ Introduction to Statistics* .......... (4)</td>
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<td>Psych 250......... Developmental Psychology .... ....... (4)</td>
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<tr>
<td>Psych 270 ........ Abnormal Psychology ............. (3)</td>
<td></td>
</tr>
<tr>
<td>Anat 204 .......... Anat. for Paramedical Personnel (3)</td>
<td></td>
</tr>
<tr>
<td>Soc 110 ............ Introduction to Sociology .......... (3)</td>
<td></td>
</tr>
<tr>
<td>Phy 301 .......... Mechanics of Human Physiology (4)</td>
<td></td>
</tr>
<tr>
<td>OT 200 ............ Intro. to Occupational Therapy ... (2)</td>
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<tr>
<td>Arts and Humanities Electives** ......................... (9)</td>
<td></td>
</tr>
</tbody>
</table>

* As a prerequisite for Psych 241, student needs to take Math 103 or 104.

** When completing your Arts and Humanities courses, it is required by the University of North Dakota that at least one course (3 credits) fulfill the World Cultures Requirement.

Admission Requirements

The criteria for admission to the professional program in occupational therapy are based upon the stated competencies and reflect the philosophy and purpose of the program. Acceptance is on a competitive basis with consideration given to pre-professional per-
formance in the sciences, general graduation requirements, leadership potential, volunteer work and personal qualifications. Each application is thoroughly reviewed. This review includes the applicant’s academic record (must have minimum overall GPA of 2.75 based on a 4 point scale), volunteer and/or work experience, references, paper and a personal interview.

During the admissions procedure, each applicant’s academic records are viewed for:
1. Total grade point average (minimum GPA 2.75).
2. Pattern of withdrawals, incompletes, etc.
3. Elective courses reflecting individual interest and development.

Admission packets are available early November of each year. Please go to our website at: http://www.med.uni.nodak.edu/depts/ot/admpck1.htm.

Year III Professional Program
Acceptance to the Graduate School requires:
1. Acceptance into the Professional Occupational Therapy program.
2. Successful completion of OT Professional Year I and II.
3. Completion of the Graduate School application forms.
4. Overall GPA of 2.75 or a 3.0 on junior and senior years.
5. Letter of endorsement from the Chair or Graduate Director of the Department which 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.

Graduate Student Requirements
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 Graduate School if placed on one additional probation within the professional program.

Reminder: Many fieldwork facilities are requiring proof of immunizations, drug testing, fingerprints, and/or criminal background checks. It is your responsibility to check the fieldwork information and to pay the cost for each process.

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 a 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.nbct.org. If you have any questions, the department will assist you in this process.

### MOT Curriculum Sequence

#### PROFESSIONAL YEAR I

<table>
<thead>
<tr>
<th>Summer Session</th>
<th>PROFESSIONAL YEAR I</th>
<th>Credits</th>
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<tbody>
<tr>
<td>OT 422 ....... Anatomy for Occupational Therapy ............ 5</td>
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<tr>
<td>OT 426 ....... Personal/Professional Development ............. 1</td>
<td>Total:</td>
<td>6</td>
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</table>

**Fall Semester**

| OT 423 ....... Fundamentals of Neuroscience for Occupational Therapy .......................... 3 | | |
| OT 425 ....... Occupational Therapy with Infants & Pre-School Children .......................... 4 | | |
| OT 427 ....... Orientation to Occupational Therapy Theory .............................................. 3 | | |
| OT 428 ....... Quantitative Research Methods for Occupational Therapy .......................... 3 | | |
| OT 431 ....... Medical Sciences I ...................................... 2 | Total: | 15 |

**Spring Semester**

| OT 424 ....... Muscle Function in Health & Disease .......................... 4 | | |
| OT 429 ....... Occupational Therapy w/School Age Children & Young Adults .......................... 4 | | |
| OT 430 ....... Psychosocial Aspects of OT for Children, Adolescents & Young Adults .......................... 4 | | |
| OT 432 ....... Medical Science II .............................................. 3 | | |
| OT 433 ....... Group Leadership Skills in OT .............................................. 2 | | |
| OT 438 ....... Practicum: Children & Adolescents .......................... 1 | Total: | 18 |

### PROFESSIONAL YEAR 2

#### Summer Session (Elective Only)

| OT 488 ....... Elective Fieldwork in Occupational Therapy .............................................. 3-9 | | |
| OT 497 ....... Cooperative Education: Occupational Therapy .............................................. 1-6 | | |
| OT 593 ....... Teaching Experience in OT .............................................. 1-3 | Total: | 1-9 |

**Schedule A**

#### Fall Semester

| OT 454 ....... Gerontic Occupational Therapy .............................................. 2 | | |
| OT 456 ....... Psychosocial Aspect of OT with the Maturing Adult .............................................. 4 | | |
| OT 457 ....... Practicum Psychosocial Dysfunction .............................................. 2 | | |
| OT 457s ....... Seminar: Practicum Integration I .............................................. 1 | | |
| OT 458 ....... Qualitative Research Methods for OT .............................................. 3 | | |
| OT 460 ....... Introduction to Management and Leadership .............................................. 2 | | |
| OT 490 ....... Occupational Therapy Seminar .............................................. 1 | Total: | 15 |

#### Spring Semester

| OT 451 ....... Multicultural Competency in OT .............................................. 2 | | |
| OT 452 ....... Assistive Technology I .............................................. 3 | | |
| OT 453 ....... Physical Aspects of OT with the Maturing Adult .............................................. 5 | | |
| OT 455 ....... Practicum Physical Dysfunction .............................................. 2 | | |
| OT 455s ....... Seminar: Practicum Integration II .............................................. 1 | | |
| OT 461 ....... Management in the U.S. Healthcare System .............................................. 2 | | |
| OT 494 ....... Directed Study in Occupational Therapy .............................................. 1 | Total: | 16 |
### Schedule B

#### Fall Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>OT 452</td>
<td>Assistive Technology I</td>
<td>3</td>
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<tr>
<td>OT 453</td>
<td>Physical Aspects of OT with the Maturing Adult</td>
<td>5</td>
</tr>
<tr>
<td>OT 455</td>
<td>Practicum: Physical Dysfunction</td>
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<tr>
<td>OT 455s</td>
<td>Seminar: Practicum Integration II</td>
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<tr>
<td>OT 458</td>
<td>Qualitative Research Methods for OT</td>
<td>3</td>
</tr>
<tr>
<td>OT 460</td>
<td>Introduction to Management and Leadership</td>
<td>2</td>
</tr>
<tr>
<td>OT 490</td>
<td>Occupational Therapy Seminar</td>
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</tr>
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#### Spring Semester

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>OT 451</td>
<td>Multicultural Competency in OT</td>
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<tr>
<td>OT 454</td>
<td>Gerontic Occupational Therapy</td>
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<tr>
<td>OT 456</td>
<td>Psychosocial Aspects of OT with the Maturing Adult</td>
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<tr>
<td>OT 457</td>
<td>Practicum: Psychosocial Dysfunction</td>
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<td>OT 457s</td>
<td>Seminar: Practicum Integration I</td>
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<tr>
<td>OT 461</td>
<td>Management in the U.S. Healthcare System</td>
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<tr>
<td>OT 494</td>
<td>Directed Study in Occupational Therapy</td>
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#### Fall and Spring Semester Electives

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>OT 489</td>
<td>Independent Project</td>
<td>1-3</td>
</tr>
<tr>
<td>OT 493</td>
<td>Workshop/OT</td>
<td>1-6</td>
</tr>
<tr>
<td>OT 496</td>
<td>Community Experience in OT</td>
<td>1-4</td>
</tr>
<tr>
<td>OT 497</td>
<td>Cooperative Education: OT</td>
<td>1-6</td>
</tr>
<tr>
<td>OT 593</td>
<td>Teaching Experience in OT</td>
<td>1-3</td>
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<tr>
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#### PROFESSIONAL YEAR 3 Graduate School Schedule A

##### Summer Session:

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>OT 585</td>
<td>Fieldwork in Psychosocial Dysfunction</td>
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<tr>
<td>OR</td>
<td></td>
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<tr>
<td>OT 587</td>
<td>Fieldwork in Physical Dysfunction</td>
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##### Fall Semester:

**Assistive Technology Track:**

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<tbody>
<tr>
<td>OT 504</td>
<td>Occupation and Vocation</td>
<td>3</td>
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<tr>
<td>OT 507</td>
<td>Innovation Management and Leadership</td>
<td>3</td>
</tr>
<tr>
<td>OT 515</td>
<td>Integration of OT Theory</td>
<td>3</td>
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<tr>
<td>OT 502</td>
<td>Assistive Technology II</td>
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<tr>
<td>OT 582</td>
<td>Graduate Practicum</td>
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**Administration/Management Track:**

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<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>OT 504</td>
<td>Occupation and Vocation</td>
<td>3</td>
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<tr>
<td>OT 507</td>
<td>Innovation Management and Leadership</td>
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<tr>
<td>OT 515</td>
<td>Integration of OT Theory</td>
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<tr>
<td>OT 509</td>
<td>Principles of Education in OT</td>
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<td>OT 511</td>
<td>Service Delivery Systems</td>
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##### Spring Semester Electives:

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>OT 493</td>
<td>Workshop/OT</td>
<td>1-12</td>
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<tr>
<td>OT 508</td>
<td>Therapeutic Procedures and Modalities in OT</td>
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<tr>
<td>OT 510</td>
<td>Advanced Anatomy and Clinical Kinesiology</td>
<td>2</td>
</tr>
<tr>
<td>OT 512</td>
<td>Advanced Neuroscience</td>
<td>2</td>
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<tr>
<td>OT 582</td>
<td>Graduate Practicum</td>
<td>1-3</td>
</tr>
<tr>
<td>OT 589</td>
<td>Readings in OT</td>
<td>1-2</td>
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<tr>
<td>OT 593</td>
<td>Teaching in OT</td>
<td>1-3</td>
</tr>
<tr>
<td>OT 599</td>
<td>Special Topics in OT</td>
<td>1-2</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>13-14</strong></td>
</tr>
</tbody>
</table>

**NOTE:** The Department reserves the right to cancel a track and/or elective courses due to finances or staffing issues. In order for a track to be offered, a minimum of 5 students must enroll in the track.
Courses

200. Introduction to Occupational Therapy. 2 credits. Prerequisites: Anatomy 204, Psychology 251, and Departmental Major. History, scope, objectives, and functions of Occupational Therapy. F, S

422. Anatomy for Occupational Therapy. 5 credits. Detailed study of human anatomy, with an emphasis on skeletal muscle, its vasculature, and the peripheral ner-

vous system. The laboratory portion of the course allows for a direct study of the human form through dissection of human cadavers. S, SS

423. Fundamentals of Neuroscience for Occupational Therapy. 3 credits. Sur-

vey of the major theories of behavior, cognition, and neurological disorders based on experimental findings in neuroanatomy, neurophysiology, and neurobiology. Labora-
tory included. F

424. Muscle Function in Health and Disease. 4 credits. The study of musculature acting on the extremities and trunk. Theory and techniques of musculoskeletal evalua-
tion with analysis of normal and pathological human motion. Laboratory included. S

425. Occupational Therapy with Infants & 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 treat-

ment outcomes. Laboratory included. F

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. SS

427. Orientation to Occupational Therapy Theory. 3 credits. Orientation to human occupation, occupational performance assessment, theoretical practice models, and core processes in occupational therapy. F

428. Quantitative Research Methods for Occupational Therapy. 3 credits. Design, implementation, and evaluation of quantitative research; the interpretation of statistics as applied to occupational therapy, and the process of presentation and publication of quantitative research projects. Laboratory included. F

429. Occupational Therapy with School Age Children & Young Adults. 4 credit-
ts. Normal and abnormal human development, disease and disability, school age through young adulthood. Emphasis on assessment, intervention planning and program out-

comes for individuals with disabilities in a variety of practice settings including school, community, and medicine. Laboratory included. S

430. Psychosocial Aspects of OT for Children, Adolescents & Young Adults. 4 credits. Psychosocial development and interruptions to development in children, adolescents, and young adults, with emphasis on OT evaluation, treatment planning and implementing outcomes. Laboratory included. S

431. Medical Sciences 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. F

432. Medical Sciences 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. S

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. S

438. Practicum: Children & Adolescents. 1 credit. Observation and experience in a university-approved pediatric and/or adolescent facility; supervised by occupa-
tional therapists, educators, and allied health professionals. S

451. Multicultural Competency in OT. 2 credits. Develop an understanding of and an appreciation for cultural and ethnic diversity. Introduction to the major concepts of culture, race, and ethnicity within the context of providing OT services. S

452. Assistive Technology I. 3 credits. Introductory study of assistive technol-

ogy devices and products, assessment, and application methods focuses on adaptations, modifications, and technology systems and services that assist individuals with dis-

abilities in greater independence and accessibility across the lifespan. Laboratory in-

cluded. F

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. F

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 in-

cluded. F/S

455. Practicum: Physical Dysfunction. 2 credits. Observation and experience in facilities supervised by registered occupational therapists, qualified health profession-

als and university faculty. The student begins to integrate and synthesize the theoretical knowledge of physical function/dysfunction with clinical practice. F/S

455S. Seminar: Practicum Integration II. 1 credit. Integration of didactic infor-

mation with Level I clinical practice in the area of physical dysfunction. It provides additional information related to documentation and introduces specialty areas accord-

 ing to student's interest and needs. Includes clinical disabilities practice. F/S

456. Psychosocial Aspects of OT with the Maturing Adult. 4 credits. Psychoso-
cial development and interruptions to development in the maturing adult with emphasis on OT evaluation, treatment planning and implementation, and treatment outcomes. Laboratory included. F

457. Practicum: Psychosocial Dysfunction. 2 credits. Occupational therapy ex-

perience in mental health field facilities, supervised by registered occupational thera-

pists, qualified health professionals and university faculty. The student begins to inte-

grate and synthesize the theoretical knowledge of psychosocial function/dysfunction with clinical practice. F/S

457S. Seminar: Practicum Integration I. 1 credit. Integration of didactic infor-

mation with Level I clinical practice in the area of psychosocial dysfunction. Includes effective communication, individual responsibility for professional development, self-

evaluation, and the dynamics of constructive feedback. F/S

458. Qualitative Research Methods for Occupational Therapy. 3 credits. De-

sign and implementation of qualitative research, evaluation of qualitative research stud-

ies, analysis and interpretation of qualitative data, and the process of publication and presentation of qualitative research projects. Laboratory included. F

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 func-
tions. Laboratory included. F

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. F

462. Effective Fieldwork in Occupational Therapy. 3 credits. Application of occupational therapy in evaluation and treatment in optional areas of student special interest in selected fieldwork facilities. One to three months full-time. F, SS

489. Independent Projects. 1-3 credits, repeatable to 12 credits. Individual study and/or research in a particular area with interest for the students with approval of a supervi-

sing faculty member. Elective for OT majors. F

490. Occupational Therapy Seminar. 1 credit. Foundational knowledge rel-

evant to the preparation of an independent study proposal. Serves as the basis for OT 494: Directed Study in Occupational Therapy. F

493. Workshop/Occupational Therapy. 1-12 credits, repeatable to 12 credits. A workshop course with topics dictated by faculty and student interests primarily for but not confined to continuing education. On demand.

496. Community Experience in OT. 1-4 credits, repeatable to 12 credits. Student initiates and participates in off-campus professional learning activities related to OT under joint faculty and on-site professional supervision. F, SS

497. Cooperative Education: Occupational Therapy. 1-6 credits, repeatable to 12 credits. Qualified students are employed by selected facilities to further understand-

ing of occupational therapy and health-related service provision. F, SS

502. Assistive Technology II. 3 credits. Advanced course in assistive technol-

ogy application and practice including assessment, program planning and intervention outcomes. Focus on occupationally based intervention plans and strategies using assistive technology for individuals with disabilities across contexts. Laboratory in-

cluded. Enrollment in one credit of OT 582 fieldwork required. F

504. Occupation and Vocation. 3 credits. Application of assessment and prob-

lem-solving skills necessary for remediation/rehabilitation of occupational performance deficits in the work realm. Laboratory included. F/S

507. Innovative Management & Leadership. 3 credits. Develop and demonstrate an understanding of the skills necessary to plan, implement and evaluate programs and material for educational, consultation and private practice. F/S

508. Therapeutic Procedures & Modalities in OT. 2 credits. Occupational therapy theory and application of specific neuromuscular techniques and modalities to promote musculoskeletal function. Laboratory included. F/S

509. Principles of Education in OT. 2 credits. Explores the methods and strateg-

ies used to develop, implement and evaluate education programs for students in academic 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. F/S

510. Advanced Anatomy and Clinical Kinesiology. 2 credits. Detailed study of anatomy and kinesiology applied to OT practice. F

511. Service Delivery Systems. 3 credits. In depth analysis of current health care developments and trends that affect quality, access, and costs. Topics include legislation/ policy issues, classification systems, role of public health and prevention programs, comparison of service delivery settings, special populations, evaluation of outcomes and future issues in health care. F

512. Advanced Neurosciences for OT. 2 credits. Detailed study of neuro-

science and therapeutic concepts as related to OT practice. F

515. Integration of Occupational Therapy Theory. 3 credits. Analysis and ap-

plications of theoretical perspectives to occupational therapy process with individu-

als and service delivery systems. Corequisite: OT 494. F/S

582. Graduate Practicum. 1-3 credits, repeatable to 12 credits. Supervised expe-
rience 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 gradu-

ate study. Students will be supervised by on-site personnel. (One credit hour required as corequisite for OT 502; additional hours optional). F, SS.
Pharmacology, Physiology and Therapeutics

Professors: Benoit, Brown-Borg, Combs, Doze, Geiger (Chair), Ghribi, Haselton, Lei, Murphy, Picklo (Graduate Director), Porter, Rosenberger and Vari

Program Description

The mission of the Graduate Program of the Department of Pharmacology, Physiology, and Therapeutics is to train and educate students to become successful scientists by providing a rigorous academic foundation combined with cutting-edge biomedical research training. Our graduate program provides coursework and research opportunities leading to the M.S. and Ph.D. The research interests of our faculty cover a wide range of topics including aging, neurodegenerative disease, neurotoxicology, synaptic transmission, lipid metabolism, cardiovascular physiology, renal physiology and molecular pharmacology.

Active participation in Departmental activities such as journal discussion groups and seminars is an integral part of training and is expected of students.

Admission Requirements

1. Successful completion of two semesters or equivalent course in general chemistry, and courses in general biology, general physics, and organic chemistry.
2. Undergraduate courses in analytical chemistry, calculus, genetics, physiology, biochemistry and statistics are desirable.
3. Overall undergraduate GPA of at least 3.0.
4. GRE scores on the General Test are required.
5. Graduate students may be admitted to either the M.S. program or directly to the Ph.D. program.
6. 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.

Degree Requirements

Students are advised to consult the current approved guidelines for additional requirements or changes.

Master of Science

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.

I. Coursework:

BIMD 500 .... Cellular and Molecular Foundations of Biomedical Science ............................................. (6)
BIMD 510 .... Basic Biomedical Statistics .................................................. (2)
BIMD 513 .... Seminars in Biomedical Science ............................................. (1)
BIMD 515 .... Steps to Success in Graduate School ........................................... (1)
BIMD 516 .... Responsible Conduct in Research ............................................. (1)
PPT 500* .... Principles of Physiology and Pharmacology ................................ (6)
PPT 505 ...... Research Techniques ................................................................. (3)
PPT 521 ...... Seminar in Pharmacology, Physiology & Therapeutics ........ (1)
Electives ....................................................................................................... (6)
(See Elective course offerings. Three credits must be from PPT electives)
PPT 591/998 Research/Thesis ................................................................. (6)
Minimum Total Credits ................................................................. (30)

ELECTIVES:
PPT 503 ...... Advanced Pharmacology or Physiology ............................. (3)
PPT 525 ...... Advanced Renal Physiology ............................................... (3)
PPT 526 ...... Advanced Respiratory Physiology ..................................... (3)
PPT 527 ...... Advanced Neurophysiology .............................................. (3)
PPT 528 ...... Advanced Endocrinology .................................................... (3)
PPT 529 ...... Advanced Cardiovascular Physiology ............................... (3)
PPT 511 ...... Biochemical & Molecular Mechanisms of Pharmacology .... (3)
PPT 505 ...... Research Techniques ................................................................. (1-3)
(Note: NOT an elective for Ph.D. students)
PPT 510 ...... Advanced Neurochemistry ................................................... (3)
PPT 515 ...... Mechanisms of Neurodegenerative Disorders ................. (3)
PPT 540 ...... Molecular Neuropharmacology ........................................... (3)

* A student must obtain at least a “B” in PPT 500 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, 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

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.

I. Coursework:

BIMD 500 .... Cellular and Molecular Foundations of Biomedical Science ............................................. (6)
BIMD 510 .... Basic Biomedical Statistics .................................................. (2)
II. Teaching
The teaching requirement will be defined by the student’s Faculty Advisor Committee and will include one semester of laboratory teaching, e.g., PPT 301, 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.

Courses

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. Spring Semester.

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 515. Steps to Success in Graduate School. 1 credit. 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 results, conflict of interest, and compliance. Examples and case studies will be drawn primarily from the biomedical sciences.

500. Principles of Physiology and Pharmacology. 6 credits. Prerequisites: BIMD 500 or consent of instructor. 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.

503. Advanced Pharmacology or Physiology. 3 credits. Prerequisite: PPT 500 or consent of instructor.

505. Research Techniques. 1-3 credits. Prerequisite: consent of instructor.

511. Biochemical and Molecular Mechanisms of Pharmacology. 3 credits. Prerequisites: BIMD 500, PPT 500 or consent of instructor. Fundamental concepts of pharmacology with emphasis on biochemical and molecular mechanisms.

512. Special Topics in Pharmacology, Physiology and Therapeutics. 2 credits. Prerequisite: consent of instructor. An in-depth coverage of a particular topic chosen by the instructor.

521. Seminar in Pharmacology, Physiology and Therapeutics. 1 credit. S/U grading only.

525. Advanced Renal Physiology. 3 credits. Prerequisites: PPT 500 or consent of instructor.

527. Advanced Neurophysiology. 3 credits. Prerequisites: PPT 500 or consent of instructor.

528. Advanced Endocrinology. 3 credits. Prerequisites: PPT 500 or consent of instructor.

529. Advanced Cardiovascular Physiology. 3 credits. Prerequisites: PPT 500 or consent of instructor.

530. Advanced Pharmacology or Physiology. 3 credits. Prerequisites: PPT 500 or consent of instructor.

533. Mechanisms of Neurodegenerative Disorders. 3 credits. Prerequisites: BIMD 500 or PPT 500 or consent of instructor. This course is designed to introduce students to the latest developments in molecular neuropharmacology. It is intended for graduate students who have a background in pharmacology and/or basic neurophysiology. The course is designed to provide an overview of the more common neurodegenerative disorders and address the "state of the field" for each. The course emphasis will be upon neuropathology, clinical presentation, and therapeutic options.

540. Molecular Neuropharmacology. 3 credits. Prerequisites: BIMD 500 or consent of instructor. This advanced course is designed for graduate students who have a background in pharmacology and/or basic neurophysiology. The course is designed to provide an overview of the more common neurodegenerative disorders and address the "state of the field" for each. The course emphasis will be upon neuropathology, clinical presentation, and therapeutic options.

590. Readings in Pharmacology, Physiology and Therapeutics. 1 to 4 credits repeatable to a maximum of 4 credits. Prerequisite: consent of instructor. A supervised readings course on topics of mutual interest to the student and a faculty member. Consent of instructor required.


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.

Pre-Physical Therapy Requirements

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 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 Introductory Sociology (3 cr.)
- One semester of a Public Speaking course (3 cr.)
- Two semesters of English Composition (6 cr.)
- Arts and Humanities coursework (9 cr.)
- World Culture course

All of the prerequisite coursework must be completed before entering the professional program in the Fall semester. However, the prospective student may be enrolled in pre-professional coursework at the time of application. Students must apply for the professional program. WICHE-eligible students must apply to UND-PT through the WICHE certification process. Out-of-state student inquiries should be addressed to the Admissions Coordinator at UND-PT. Applications for the professional program are available on our website and from the UND-PT office.

Admission Requirements

1. 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).
2. Reference letters, a personal interview, and other personal qualifications are also considered prior to final acceptance. Prospective students are expected to complete at least 60 hours of observation prior to admission.
3. Acceptance by the Office of Admissions to UND does not constitute acceptance into the professional program in Physical Therapy.

Degree Requirements

1. The professional education component of the D.P.T. will require three academic years and two summer sessions following completion of the pre-physical therapy entrance requirements.
2. 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.
3. Acceptance into the Graduate School requires:
   a. Acceptance into the professional Physical Therapy program.
   b. Completion of a baccalaureate degree.
   c. Completion of the Graduate School application forms.
   d. Letter of endorsement from the Chair of Physical Therapy which assures automatic advancement in status from the undergraduate program to the graduate program.
4. Students in the professional program should be aware that there are special requirements for clinical uniforms, professional liability insurance, medical insurance, a current immunization record, and CPR certification. In addition, some facilities may require 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.
5. 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 110, 120 or</td>
<td>125 &amp; COMM 110</td>
</tr>
<tr>
<td>BIOL 150, 151</td>
<td>Introduction to Biology ..................</td>
</tr>
<tr>
<td>CHEM 121, 122</td>
<td>Gen. Chemistry I, II ....................</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Intro to Sociology ......................</td>
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<tr>
<td>(or approved substitute)</td>
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<tr>
<td>PSY 111</td>
<td>Intro to Psychology .....................</td>
</tr>
<tr>
<td>PHYS 161, 162</td>
<td>Intro to College Physics ................</td>
</tr>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel ..........</td>
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<tr>
<td>PHY 301</td>
<td>Mechanics of Human Physiology ...........</td>
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<tr>
<td>PSY 250</td>
<td>Developmental Psychology ................</td>
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<tr>
<td>PSY 270</td>
<td>Abnormal Psychology ....................</td>
</tr>
<tr>
<td>PT 101</td>
<td>Orientation to Physical Therapy ..........</td>
</tr>
</tbody>
</table>

Electives (required) Minimum of 20 with emphasis in a single discipline

*One course should fulfill the World Culture requirement
### Professional Program - Physical Therapy

**Professional Year 01 - Fall Semester (17 cr.)**

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PT 401</td>
<td>Intervention Techniques I</td>
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<tr>
<td>PT 402</td>
<td>Professional Communication and Behavior</td>
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<tr>
<td>PT 409</td>
<td>Clinical Pathology I</td>
<td>4</td>
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<tr>
<td>PT 422</td>
<td>Anatomy for Physical Therapy</td>
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<td>PT 423</td>
<td>Neuroscience for Physical Therapy</td>
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**Professional Year 01 - Spring Semester (19 cr.)**

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<tbody>
<tr>
<td>PT 410</td>
<td>Clinical Pathology II</td>
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</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 Examination and Evaluation I</td>
<td>4</td>
</tr>
<tr>
<td>PT 426</td>
<td>Manual Therapy I</td>
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**Professional Year 01 - Summer Session (10 cr.)**

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<tbody>
<tr>
<td>PT 512</td>
<td>Therapeutic Agents</td>
<td>1</td>
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<tr>
<td>PT 513</td>
<td>Intervention Techniques II</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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**Professional Year 02 - Fall Semester (19 cr.)**

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<tbody>
<tr>
<td>PT 520</td>
<td>Clinic I: Clinical Practice</td>
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<tr>
<td>PT 521</td>
<td>Critical Inquiry I</td>
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**Professional Year 02 - Spring Semester (17-18 cr.)**

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<tr>
<td>PT 522</td>
<td>Administration in Physical Therapy</td>
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<tr>
<td>PT 523</td>
<td>Lifespan I</td>
<td>2</td>
</tr>
<tr>
<td>PT 524</td>
<td>Psychological Aspects of Disability</td>
<td>2</td>
</tr>
<tr>
<td>PT 526</td>
<td>Manual Therapy II</td>
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<tr>
<td>PT 527</td>
<td>Critical Inquiry II</td>
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<tr>
<td>PT 583</td>
<td>Critical Inquiry III</td>
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<tr>
<td>EFR 515</td>
<td>Statistics I</td>
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**Professional Year 02 - Summer Session (9-10 cr.)**

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<tbody>
<tr>
<td>PT 540</td>
<td>Cardiopulmonary Physical Therapy</td>
<td>2</td>
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<tr>
<td>PT 562</td>
<td>Readings: Physical Therapy</td>
<td>1</td>
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<tr>
<td>PT 591</td>
<td>Critical Inquiry IV</td>
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<td>PT 592</td>
<td>Case Management II</td>
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**Professional Year 03 - Fall Semester (16-17 cr.)**

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<th>Course Title</th>
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<td>PT 511</td>
<td>Applied Movement Science/ Rehabilitation Procedures</td>
<td>4</td>
</tr>
<tr>
<td>PT 525</td>
<td>Clinical Examination and Evaluation II</td>
<td>4</td>
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<tr>
<td>PT 535</td>
<td>Lifespan II</td>
<td>2</td>
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<tr>
<td>PT 539</td>
<td>Prevention and Wellness</td>
<td>3</td>
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<tr>
<td>PT 561</td>
<td>Seminar: Physical Therapy</td>
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**Professional Year 03 - Spring Semester (19 cr.)**

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<tbody>
<tr>
<td>PT 552</td>
<td>Clinic II: Clinical Practice</td>
<td>18</td>
</tr>
<tr>
<td>PT 995</td>
<td>Scholarly Project</td>
<td>1</td>
</tr>
</tbody>
</table>

### Courses

1. **Orientation to Physical Therapy.** 1 credit. Overview of the field of rehabilitation. Survey of the occupational therapist and physical therapist: Films, lectures, and observation in clinical settings.

2. **Intervention Techniques I.** 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Beginning skills for patient management, skills in safety and positioning, draping, therapeutic massage, surface anatomy, and an introduction to communication techniques. Laboratory.

3. **Intervention Techniques II.** 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Disease groups discussed from all aspects of comprehensive rehabilitation. Included are chronic illness, neurological and orthopedic conditions, general medicine and surgery, pediatrics, geriatrics, and sensory disabilities.

4. **Intervention Techniques III.** 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Disease groups discussed from all aspects of comprehensive rehabilitation. Included are chronic illness, neurological and orthopedic conditions, general medicine and surgery, pediatrics, geriatrics, and sensory disabilities.

5. **Intervention Techniques IV.** 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Biomechanics and kinesiology of musculature acting on the extremities and trunk. Theory and techniques of muscle testing and goniometry. Laboratory.

6. **Exercising in Health and Disease.** 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Lecture and laboratory work to examine and maintain/increase mobility, strength, and endurance for healthy individuals and those with disease, with completion of an exercise prescription to address impairments and functional limitations. Functions of the musculoskeletal, pulmonary, and cardiovascular systems will be addressed individually and within their relationships. Laboratory.

7. **Motor Control.** 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Lecture and laboratory work in therapeutic exercise to establish and maintain muscle control and coordination, including muscle re-education, facilitation, and relaxation. Laboratory.

8. **Clinical Examination and Evaluation I.** 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Emphasizes patient/client management elements of examination and evaluation. Emphasis is given to the musculoskeletal and neurological systems. Laboratory.

9. **Anatomy for Physical Therapy.** 5 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Detailed lectures and demonstrations on musculoskeletal anatomy and neuroanatomy. Laboratory.

10. **Neuroscience for Physical Therapy.** 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Structure and function of the human nervous system including clinical application relevant to physical therapy practice.

11. **Manual Therapy I.** 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Introduction to joint mobilization with emphasis on peripheral joints. Basic evaluation treatment techniques and exercises for the lumbar and cervical spine. Laboratory.

12. **Special Topics.** 1-4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Introductions to cardiovascular physical therapy. Latest developments in the field of physical therapy.


14. **Applied Movement Science and Rehabilitation Procedures.** 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Integration of clinical evaluation, functional goals, and treatment planning for individuals with neurological and 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.

15. **Therapeutic Agents.** 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Theory and application of various hydrotherapy, phototherapy, and thermotherapy modalities in Physical Therapy, including heat, light, sound, and water. Laboratory.

16. **Intervention Techniques II.** 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Theory and practical application of introductory patient care techniques in physical therapy including gait, range of motion, transferring, bandaging, wound care, vital signs, and aseptic and isolation techniques. Laboratory.

17. **Case Management I.** 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Case management with integration of examination, evaluation, diagnostic, plan of care, and intervention strategies. Verbal and written communication skills will be emphasized. Laboratory.

18. **Electrotherapy and Electrodiagnosis.** 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Theory and application of therapeutic electrical currents, biofeedback, electromyography, and nerve conduction velocity in physical therapy. Laboratory.

19. **Clinical Internship I.** 18 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Full-time clinical experience in selected physical therapy provider centers throughout the United States.

20. **Critical Inquiry I.** 1 credit. Prerequisite: Registered in Professional Physical Therapy Curriculum. Introduction to the collection of clinical data leading to a case study report.

21. **Administration in Physical Therapy.** 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Lectures/discussions and seminar formats used to explore concepts of administration procedures as applied to Physical Therapy and the health care delivery system.
524. Psychological Aspects of Disability. 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Course focus is on rehabilitation issues related to psychology including the characteristics of disabling conditions, developmental evaluation and intervention, the use of adaptive equipment, legal issues, and strategies to promote collaborative service provision to children and families. Laboratory.

525. Clinical Examination and Evaluation I. 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. 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 disabilities, including terminal illness.

526. Clinical Examination and Evaluation II. 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Emphasizes patient/client management elements of examination and evaluation. Emphasis is given to systems review and differential diagnosis, clinical decision making resulting in referral and/or modified physical therapy interventions, and the communication of findings. Laboratory.

527. Critical Inquiry II. 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Fundamentals of spinal mobilization techniques along with theory and application of specific approaches to spinal manual therapy. Laboratory.

528. Directed Studies/Clinical Concepts. 1-12 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Students provide a final written and oral report to the faculty on the results of their collaborative Scholarly Project.

529. Directed Studies/Clinical Concepts. 1-3 credits. Prerequisite or corequisite: Registered in Professional Physical Therapy Curriculum. Individualized study of a particular area of interest for the student approved by his/her major advisor and supervised by preceptors. Focus on rehabilitation issues, including terminal illness.

591. Critical Inquiry IV. 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Students begin data collection and analysis for the scholarly project requirement.

592. Case Management II. 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. 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.

995. Scholarly Project. 1 credit. Prerequisite: Registered in Professional Physical Therapy Curriculum. Students provide a final written and oral report to the faculty on the results of their collaborative Scholarly Project.

Physician Assistant Studies

Professors: Burns (Medical Director), Kuntz, Larson, Laxen (Program Director), McCleary and McHugo

Program Description: Master of Physician Assistant Studies (MPAS)

The School of Medicine and Health Sciences, Department of Family and Community Medicine, offers a clinically oriented, rural emphasis terminal degree, a Master of Physician Assistant Studies. Physician Assistants (PA) are health care professionals licensed to practice medicine with physician supervision. They are skilled members of the health care team fulfilling a broad range of medical services that would otherwise be provided by a physician. The program prepares clinically practicing registered nurses and other licensed clinical professionals who have had extensive experience, to work as a PA within the medical model, especially in rural and underserved areas.

The program is accredited by ARC-PA. (Accreditation Review Commission on Education for the Physician Assistant, Inc.).

The MPAS degree is twenty-four months in length and is offered through a combination of on-line courses, on-campus study, and extensive clinical experience. The curriculum is designed to prepare clinically competent physician assistant practitioners.

Admission Requirements

Acceptance is on a competitive basis with emphasis on the proven adult learner with clinical experience in primary care nursing, or, if selected for the “pilot” group, clinical experience in a health care profession.

1. Current licensure in nursing, or, to be a member of the “pilot” group, professional licensure, registration, or certification in one’s clinical field.
2. RN with a minimum of 2 years of clinical experience, or, if a member of the “pilot” group, a minimum of 3 years clinical experience in one’s field of certification/licensure.
3. BA or BS degree, preferably in a health-related area.
4. Previous coursework in anatomy, physiology, and pharmacology.
5. GPA of 2.75 or higher in undergraduate work, or more recent transcripts showing improvement. (If GPA is lower, an applicant may be accepted, but would be accepted on a Provisional Status in the Graduate School for the first semester.)
6. A proven record of continuing education in areas appropriate to the applicant’s field.
8. Completion of a successful interview.
9. Reference letter, written personal statement and other personal qualifications are also considered prior to final acceptance.
Degree Requirements

1. Successful completion of all courses in core curriculum.
2. Completion of a Scholarly Project.

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PA 500</td>
<td>Introduction to the PA Role</td>
<td>2</td>
</tr>
<tr>
<td>PA 505</td>
<td>Anatomy and Medical Terminology</td>
<td>3</td>
</tr>
<tr>
<td>PA 510</td>
<td>Pathophysiology for the Physician Assistant</td>
<td>3</td>
</tr>
<tr>
<td>PA 515</td>
<td>Investigative Studies for the Physician Assist.</td>
<td>3</td>
</tr>
<tr>
<td>PA 516</td>
<td>Intro to Pharmacology and Basic EKG</td>
<td>2</td>
</tr>
<tr>
<td>PA 520</td>
<td>Evidence Based Medicine I</td>
<td>2</td>
</tr>
<tr>
<td>PA 525</td>
<td>Evidence Based Medicine II</td>
<td>2</td>
</tr>
<tr>
<td>PA 540</td>
<td>Primary Care I</td>
<td>8</td>
</tr>
<tr>
<td>PA 541</td>
<td>Primary Care I Clinical</td>
<td>4</td>
</tr>
<tr>
<td>PA 550</td>
<td>Primary Care II</td>
<td>8</td>
</tr>
<tr>
<td>PA 551</td>
<td>Primary Care II Clinical</td>
<td>6</td>
</tr>
<tr>
<td>PA 560</td>
<td>Primary Care III</td>
<td>8</td>
</tr>
<tr>
<td>PA 561</td>
<td>Primary Care III Clinical</td>
<td>5</td>
</tr>
<tr>
<td>PA 565</td>
<td>PA Role</td>
<td>3</td>
</tr>
<tr>
<td>PA 580</td>
<td>Specialty Clerkship</td>
<td>5</td>
</tr>
<tr>
<td>PA 585</td>
<td>Current Trends and Issues</td>
<td>2</td>
</tr>
<tr>
<td>PA 595</td>
<td>Scholarly Project</td>
<td>2</td>
</tr>
</tbody>
</table>

Total Required .................................................. 68 credits

Program Description: Transitional-MPAS

The School of Medicine and Health Science’s Department of Family Medicine offers a terminal degree in Master of Physician Assistant Studies (MPAS) for the practicing physician assistant clinician. The transitional MPAS (t-MPAS) degree is offered through a combination of on-line courses and clinical experience.

The purpose of the transitional MPAS program at UND is the augmentation of a clinically practicing physician assistant’s knowledge, skills and behaviors to a level consistent with the current professional and academic standards required of the entry-level graduate PA student. The t-MPAS is NOT intended to teach advanced clinical knowledge, skills and behaviors.

The t-MPAS degree is conferred upon completion of a post-professional educational experience and is available only to nationally certified, clinically practicing physicians assistants. While the word “transitional” is used, it is not included in the formal wording of the degree.

Admission Requirements

Candidates applying for the t-MPAS must meet the following minimum requirements:

1. Must be a graduate of a Physician Assistant program accredited by the Accreditation Review Commission on Education for Physician Assistants, Inc. (ARC-PA).
2. Must have taken the NCCPA certification examination, received a passing score on the examination, and be currently certified.
3. Must be currently licensed as a Physician Assistant-Certified and show verification of such licensure or, if a graduate of the UND PA program prior to 1993 and currently practicing as a nurse practitioner, must be currently licensed as a nurse practitioner and show verification of such licensure.
4. Must have practiced clinically as a licensed PA for a minimum of one year.
5. Must have a baccalaureate degree from an accredited college or university.
6. Must submit two letters of reference
7. NOTE: The taking of GRE’s is NOT required.
8. The candidate will need to apply for admission to both the Physician Assistant program and the Graduate School. The Physician Assistant program will review the application and academic record and determine whether or not the applicant will be admitted into the t-MPAS program.
9. Once the student is admitted into the Graduate School, a program of study will be drafted for each student by the PA program advisor prior to the student starting graduate studies. The program of study will be approved by the PA program director and submitted to the Graduate School.

The t-MPAS programs of study are individually determined based on a review of the candidate’s entry level professional coursework. UND Physician Assistant faculty members will determine an appropriate program of study for the candidate at the time of acceptance into the program. Since the t-MPAS is meant to augment knowledge learned when first going to school, much of the present MPAS curriculum will be utilized. The coursework originally taken by the student will be compared to the new curriculum. From that, it will be decided what courses the student needs to complete. Minimum credit requirements will be 22 and the maximum is expected to be 27.

All courses will be done on-line. After completing all required courses, the student will graduate with a Master of Physician Assistant Studies.

Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>PA 510</td>
<td>Pathophysiology</td>
<td>3</td>
</tr>
<tr>
<td>PA 515</td>
<td>Investigative Studies</td>
<td>3</td>
</tr>
<tr>
<td>PA 520</td>
<td>Evidence Based Medicine I</td>
<td>2</td>
</tr>
<tr>
<td>PA 525</td>
<td>Evidence Based Medicine II</td>
<td>2</td>
</tr>
<tr>
<td>PA 565</td>
<td>PA Role</td>
<td>3</td>
</tr>
<tr>
<td>PA 580</td>
<td>Specialty Clerkships</td>
<td>3</td>
</tr>
<tr>
<td>PA 585</td>
<td>Current Trends and Issues</td>
<td>2</td>
</tr>
<tr>
<td>PA 595</td>
<td>Scholarly Project</td>
<td>2</td>
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</table>

Total Required .................................................. 22-27 credits

Elective Courses

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PA 588</td>
<td>International Clerkship</td>
<td>1-4</td>
</tr>
<tr>
<td>PA 589</td>
<td>Readings in Physician Assistant Studies</td>
<td>1-3</td>
</tr>
<tr>
<td>PA 599</td>
<td>Special Topics in Physician Assistant Studies</td>
<td>1-3</td>
</tr>
<tr>
<td>PA 990</td>
<td>Continuing Education Workshops in Physician Assistant Studies</td>
<td>1-8</td>
</tr>
<tr>
<td>PA 996</td>
<td>Continuing Enrollment/Physician Assistant Studies</td>
<td>credit arranged</td>
</tr>
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</table>

Courses

500. Introduction to the PA Role. 2 credits. Prerequisite: Enrolled in Physician Assistant Program. This on-line course introduces the student to the profession. It reviews the history of the profession, the history of the UND PA Program, and the challenges to be faced in role transition as well as PA organizations on both the state and national level. It covers the different techniques of interviewing including interviewing of different age groups or ethnic or cultural backgrounds for the purpose of obtaining information for a patient’s medical history.

505. Anatomy and Medical Terminology. 3 credits. Prerequisite: Enrolled in Physician Assistant Program. This on-line, self-directed course is a review of the basic principles of anatomy and medical terminology in preparation for the clinical phase of the program, especially physical assessment, medical interviewing, and medical charting.

510. Pathophysiology for the Physician Assistant. 3 credits. Prerequisite: Enrolled in the Physician Assistant Program. This on-line course covers the pathophysiologic function of the human body and its organ systems.

515. Investigative Studies for the Physician Assistant. 3 credits. Prerequisite: Enrolled in the Physician Assistant Program. This on-line course discusses basic diagnostic tests, including their role in diagnoses and treatment, acceptable norms for individual tests, and interpretations of abnormalities. Components studied include hematology, chemistry, immunology and microbiology.
516. Introduction to Pharmacology and Basic EKG. 2 credits. Prerequisite: Enrolled in Physician Assistant Program. This two-part, on-line survey course reviews pharmacokinetics in preparation for clinical pharmacology taught in Primary Care II and III; and Basic EKG’s, in preparation for EKG interpretation taught in Primary Care I and II.

520. Evidence Based Medicine I. 2 credits. Prerequisite: Enrolled in Physician Assistant Program. This on-line course provides the PA student with an overview of statistical and epidemiological principles used in medical literature. The units build sequentially to provide the student with a solid foundation, which includes applied statistical tests, in-depth literature reviews, to provide a basis of comparison for understanding the medical literature and translating research findings into the clinical setting.

525. Evidence Based Medicine II. 2 credits. Prerequisite: Enrolled in Physician Assistant Program. This four-week didactic course on the UND campus uses the analytical approach to the theory and techniques required to elicit a complete health history, perform a complete physical examination, and document findings on patients of all ages. Variance due to normal growth and development, pregnancy and aging are studied. Numerical skills and critical thinking skills are utilized to apply techniques of systematic physical examination skills.

541. Primary Care I Clinical. 4 credits. Prerequisite: Enrolled in the Physician Assistant Program. Following four weeks of didactic instruction in PA 540, this eight-week clinical practicum, supervised by a physician in a primary care setting, is required to assist students in the application of physical examination techniques.

549. Primary Care II Clinical. 4 credits. Prerequisite: Enrolled in the Physician Assistant Program. This eight-week clinical practicum on the UND campus uses the problem solving process to instruct students in the diagnosis and management of acute and emergent conditions seen in the child, adult, elderly, and pregnant women in the primary care setting. The pharmacology portion of this course discusses pharmacokinetic and pharmacodynamic principles of drug therapy; the rules and regulations of prescription writing; the scheduling of drugs; and the use of generic vs. brand name drugs. It emphasizes pharmacological preparations used in acute and emergent conditions through teaching the principles of rational drug therapy: selection, initiation, and monitoring, with current information regarding efficacy, toxicity, and the cost of pharmaceutical agents. Skills labs in suturing, EKG reading, casting and splinting are completed.

551. Primary Care II Clinical. 6 credits. Prerequisite: Enrolled in the Physician Assistant Program. Following four weeks of didactic instruction in PA 550, this ten-week clinical practicum supervised by a physician is required to assist students in the synthesis and application of theoretical and scientific concepts in the care of patients with acute and emergent conditions in a primary care setting. Included in this time is an 80-hour experience in an Emergency Room setting.

553. Primary Care II Clinical. 8 credits. Prerequisite: Enrollment in Physician Assistant Program. This four-week didactic course uses the problem solving process to instruct students in the diagnosis and management of chronic conditions seen in the child, adult and elderly in the primary care setting. Management of patients with multiple problems is emphasized. The pharmacology portion of this course emphasizes pharmacological preparations used in chronic conditions through teaching the principles of rational drug therapy: selection, initiation, and monitoring, with current information regarding efficacy, toxicity, and the cost of pharmaceutical agents. Special emphasis is given to drug interactions. Skills labs in joint injection and punch biopsies are completed.

561. Primary Care III Clinical. 5 credits. Prerequisite: Enrollment in the Physician Assistant Program. Following four weeks of didactic instruction in PA 560, this ten-week clinical practicum supervised by a physician is required to assist students in the synthesis and application of theoretical and scientific concepts as it relates to patients with chronic conditions in a primary care setting. Clinical experience in hospitals and nursing homes must be obtained by the completion of this course.

562. PA Role. 3 credits. Prerequisites: Enrolled in Physician Assistant Program. This on-line course introduces the PA student to a more complete role definition in varied sectors of the health care industry. It introduces the PA student to: the PA organization on both the state and national level; the role of the PA in rural and underserved primary care settings; credentialing; licensure; professional liability; malpractice insurance and other legal issues. It also prepares the student for transition from PA-S to PA-C: office risk management; practice preparation; role expectations; national certification and recertification; licensure; the impaired professional; leadership within the profession; and the life-long learner.

580. Specialty Clerkship. 5 credits. Prerequisite: Enrollment in the Physician Assistant Program. Specialty clinical rotations, each from two to four weeks in length, for a total of ten weeks as determined by the faculty advisor and student in consultation with the clinical preceptor, that increases knowledge in areas of interest, or is required to fulfill the program requirements for types of patients, patient settings, and age groupings.

585. Current Trends and Issues for the Physician Assistant Practitioner. 2 credits. Prerequisite: Enrollment in the Physician Assistant Program. This on-line course covers the following areas: ethical issues; end of life/palliative care; rehabilitative medicine; complementary and alternative medicine; and bioterrorism.

589. Readings in Physician Assistant Studies. 1-3 credits, repeatable to 12. Prerequisite: Approval of the Director of the Physician Assistant Program. Interested students are responsible for obtaining consent from a selected faculty member prior to beginning the course readings. In collaboration with the faculty member, readings and methods of evaluation are determined.

594. Scholarly Project. 2 credits. Prerequisite: Enrollment in the Physician Assistant Program. The scholarly project requires the student to investigate a topic related to an area of interest within primary care and/or the PA profession. This can be done individually or in groups. Before initiating the project, the student must obtain approval from designated faculty.

Physics

Professors: Chen, Dewar (Chair), Kim, Lykken, Marasinghe (Graduate Director), Moreno, Schwalm, and Young

Program Description

The Department of Physics 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.

Admission Requirements

1. Completed a minimum of 21 semester credits of undergraduate physics, plus mathematics through differential equations or the equivalent.
2. Coursework should include intermediate courses in mechanics, electricity and magnetism, optics, thermal physics, and modern quantum physics. Adequate preparation in general chemistry also is necessary.
3. An applicant without satisfactory undergraduate training may be admitted to the program, but will be required to remove deficiencies by completing the necessary undergraduate courses without receiving graduate credit for them.
4. Ph.D. applicants are encouraged to submit the Graduate Record Examination scores for the general test and advanced physics test.

Degree Requirements

Master of Science

The program is designed to provide the student with basic physics courses at the graduate level and an introduction to research.

1. Complete the following courses: PHYS 509, Methods of Theoretical Physics; PHYS 539, Quantum Mechanics; PHYS 541, Theory of Electricity and Magnetism; and PHYS 545, Analytical Mechanics.
2. Complete six additional hours from the following: PHYS 510, Methods of Theoretical Physics; PHYS 540, Quantum Mechanics; and PHYS 542, Theory of Electricity and Magnetism.
3. Complete research project and thesis.
Doctor of Philosophy

The degree is a research degree and is conferred only in recognition of high achievement in independent scientific research and scholarship.

1. In addition to Physics 590, Research, the coursework will amount to approximately 36 hours.
2. Completion of a regular core of courses which includes:
   - PHYS 509 and 510, Methods of Theoretical Physics
   - PHYS 539 and 540, Quantum Mechanics
   - PHYS 541 and 542, Theory of Electricity and Magnetism
   - PHYS 543, Statistical Physics
   - PHYS 545, Analytical Mechanics
   - PHYS 549, Seminar
3. Completion of several specialized graduate level courses in physics in order to obtain the in-depth training essential for the development of their research interests.
4. Completion of at least nine semester hours of graduate work (400 level or above) in a single related field.
5. 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. Student with a master’s degree will take this examination in the second semester of enrollment.
6. 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.
7. No student may proceed formally toward the Ph.D. degree until this examination has been passed.
8. 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.
9. 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.
10. At the final oral examination, the candidate presents and defends the dissertation.

Courses

509. Methods of Theoretical Physics. 3 credits. 3 hours per week. An introduction to the mathematical methods currently used in physics.
510. Methods of Theoretical Physics. 3 credits. 3 hours per week. A continuation of Physics 509.
535. Solid State Physics. 3 credits. 3 hours per week. The crystal lattice, electron theory of metals and semiconductors, and transport phenomena in solids.
536. Solid State Physics. 3 credits. 3 hours per week. Lattice vibrations, phonon-electron interactions, and cooperative phenomena in solids.
539. Quantum Mechanics. 3 credits. 3 hours per week. The Schroedinger equation, perturbation methods, and simple quantum mechanical systems.
540. Quantum Mechanics. 3 credits. 3 hours per week. Matrix methods, spin, and scattering phenomena.
541. Theory of Electricity and Magnetism. 3 credits. 3 hours per week. Electrostatics, magnetostatics, electromagnetic waves.
542. Theory of Electricity and Magnetism. 3 credits. 3 hours per week. Special theory of relativity, scattering of charged particles, and radiation.
543. Statistical Physics. 3 credits. 3 hours per week. The Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics, and their application to the description of physical systems.
545. Analytical Mechanics. 3 credits. 3 hours per week. Variational methods. Lagrange's equations, oscillations, Hamilton equations, and special relativity.
549. Seminar. 1 credit. Repeatable to maximum of 3 credits
550. Special Topics. 1 to 3 credits. Prerequisite: Consent of department. Investigation of special topics in advanced physics; the subject matter determined by student-faculty interest. May be repeated to a total of 6 credits.

Psychology

Professors Antes, Bradley, Derenne, Ferraro (Experimental Program Director), Grabe, Himle, Holm, King (Clinical Program Director), McDonald (INPSYE Director), Miller, Peters (Forensic Director), Petros, Terrance, Tyler and Weatherly (Chair)

Program Description

The master’s degree in Psychology is given only in General Psychology. The Ph.D. degree is given upon further specialization in the areas of General/Experimental or Clinical Psychology. The Clinical Psychology program is accredited by the American Psychological Association.

Minimum Admission Requirements

1. Eighteen (18) hours of undergraduate work in psychology including a course in General Psychology, Developmental, Abnormal, Statistics, and Experimental Psychology.
2. A year of biological science (biology, physiology, etc.).
3. A semester of college algebra.
4. General background in other social and natural sciences also recommended.
5. Graduate Record Examination—Verbal, Quantitative, Analytic Writing and Subject.

Applications must be complete by January 15.

Degree Requirements

General/Experimental Ph.D. Program

1. Completion of “Scholarly Tool” coursework to develop skills in research design (PSYC 543) and univariate (PSYC 541) and multivariate (PSYC 542) statistical analysis; and an empirical dissertation (for the Ph.D. degree).
2. Completion of an empirical thesis (for the M.A. degree) and an empirical dissertation (for the Ph.D. degree).
3. Completion of the comprehensive examination for the Ph.D. Program.
4. Minimum of 30 credit hours beyond undergraduate degree required for M.A. degree and minimum of an additional 60 credit hours required for the Ph.D. (minimum of 90 credit hours total).

Degree Requirements

Clinical Ph.D. Program

1. Completion of “Scholarly Tool” coursework to develop skills in research design (PSYC 543) and univariate (PSYC 541) and multivariate (PSYC 542) statistical analysis; and an empirical dissertation (for the Ph.D. degree).
2. Completion of an empirical thesis (for the M.A. degree) and an empirical dissertation (for the Ph.D. degree).
3. Completion of the comprehensive examinations for the Ph.D. in Clinical Psychology.
4. Completion of the following for the Ph.D. in Clinical 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 one-half of the total credits for the minor must be 500-level credits.

Courses

501. Psychological Foundations of Education. 3 credits. Prerequisite: Graduate standing in Psychology or Education. A study of the learning process with secondary emphasis on how the learning process is affected by individual differences, growth, development, and personality.

505. History of Psychology. 3 credits. Prerequisite: Graduate standing in Counseling or Psychology. 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.

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.

533. Theories of Learning. 3 credits. Prerequisite: Graduate standing in Psychology or Counseling or consent of instructor. Examination of the evidences in support of the various systematic theories of learning.

535. Physiological Psychology. 3 credits. Physiological basis of psychological functions.

537. Psychophysiology. 3 credits. Prerequisites: Graduate status in psychology, Examination of the anatomy and physiology of several physiologic systems, the relationships between behavior and physiology, and the importance of individual differences in physiological responses.

542. Multivariate Statistics for Psychology. 3 credits. Prerequisites: Graduate standing and Psychology 541. The appropriate use and interpretation of multivariate data analytic techniques in psychology.

543. Experimental Design. 3 credits. Prerequisite: Psychology 541 or consent of instructor. Application of statistics and probability theory to the design and analysis of experiments.

551. Advanced Developmental Psychology. 3 credits. Prerequisites: Graduate status in Psychology or permission of instructor. In-depth analysis and integration of theories and theorists relevant for current issues in lifespan developmental psychology.

560. Advanced Social Psychology. 3 credits. Prerequisites: Graduate status in Psychology. 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.

565. Multicultural Psychology. 3 credits. Prerequisites: Graduate status in psychology. Examination 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.

570. Clinical Assessment I: Basic Issues in Clinical Assessment. 4 credits. One hour lecture, four hour laboratory. Prerequisites: Clinical psychology graduate status or consent of instructor. 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.

571. Clinical Assessment II. Advanced Issues in Clinical Assessment. 4 credits. Prerequisite: Psychology 570, and/or consent of instructor. 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.

572. Community Psychology. 3 credits. Prerequisites: Psychology 571, 573, and graduate standing in Psychology. Theories and practicum in community mental health consultation. Credits in 587 may be earned in conjunction with this course.

573. Theories of Psychotherapy. 3 credits. Prerequisites or corequisites: Psychology 571 and/or consent of instructor. Theory and practicum in individual psychotherapy, with emphasis on systematic comparison of major theoretical viewpoints.

574. Advanced Therapeutic Interventions. 3 credits. Prerequisites: Psychology 573 or permission of instructor. A 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.

575. Behavior Pathology. 3 credits. Prerequisites: Psychology 270 and consent of instructor. A survey of various forms of behavior pathology with emphasis upon current research and theories relating to pathology.

576. Child Psychopathology and Treatment. 3 credits. Prerequisites: Psychology 570 and 575 or instructor permission. 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.

579. Professional Issues and Ethics in Psychology. 3 credits. Prerequisites: Graduate standing in Psychology or consent of instructor. An exploration of ethical issues pertinent to the science and practice of psychology and discussion of current professional issues facing psychology.

580. Clinical Practice. 1 to 3 credits. Prerequisites: Psychology 571, graduate standing in Psychology, and consent of instructor. 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. May be repeated to fifteen credits. S/U grading only.

587. Supervised Field Work. 1 to 3 credits. May be repeated. Prerequisites: Graduate standing in Psychology and consent of instructor. Used primarily for individualized field placement so that the student may acquire practicum experiences in clinical settings, community psychology, and group methods. S/U grading only.

593. Readings in Psychology. 1 to 3 credits. Prerequisites: advanced standing in psychology and consent of instructor. May be repeated.

594. Special Topics in Psychology. 1 to 3 credits. Prerequisite: consent of instructor. Topical courses in Psychology organized on a semester or special basis.

595. Seminar in Psychology. 1 to 3 credits. Prerequisite: consent of instructor.

596. Individual Research. Credits to be arranged.

Public Administration

Professors: Harsell, Jendryskik (Chair), Jensen (Graduate Program Director), Light, Sum and Wood

Master of Public Administration

Program Description

The purposes of the M.P.A. program are to prepare students for positions in the public service and the 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, which requires 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, and a combined BSPA/MPA or a BA/MPA program for students who meet the admission criteria.


Admission Requirements

1. Graduate Record Examination General test, the Graduate Management Admission Test or the Law School Admission Test. Students wishing to apply for Graduate Teaching Assistantships must take either the GRE or GMAT exams.

2. 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.

3. Twenty hours in the social sciences, business administration, and related fields.

4. Students who do not meet the requirements will be given the opportunity to fulfill them.

Degree Requirements

1. A minimum of 32 semester credits. A minimum of 35 credits is required for students without one year of administrative experience.

2. A minimum of 23 credits in public administration and up to 9 credits in cognate fields to total 32 credits.

3. At least one-half of the credits must be at the 500-level.

4. A maximum of eight credits may be transferred to UND from other institutions.

5. The following are required for all students:

   - POLS 500 .... Research Methods ....................... 3 credits
   - POLS 501 .... Political & Policy Analysis ............ 3 credits
   - POLS 531 .... Seminar: Public Administration ... 3 credits
   - POLS 580 .... Administrative Internship* .......... 3 credits
   - POLS 997 .... Independent Study ..................... 2 credits
   - General or Health Core Courses ...................... 12 credits
   - POLS Electives or cognate/elective courses ...... 9 credits

   Total: 32-35 credits

* This requirement will be waived for students with at least one year of administrative experience.

6. Students in the general track will choose 12 credits from the following clusters:

   Select six credits from:

   - POLS 502 ..... Seminar: Problems in State and
     Local Government ..................................... 3 credits
   - POLS 536 ..... Public Personnel ....................... 3 credits
   - POLS 538 ..... Budgeting and Financial
     Management ............................................. 3 credits
   - POLS 539 ..... Administrative Law .................... 3 credits

   Select six credits from:

   - POLS 503 ..... Government & Business .............. 3 credits
   - POLS 508 ..... Seminar: Legislative and
     Executive Process ..................................... 3 credits
   - POLS 532 ..... Public Policy ............................ 3 credits
   - POLS 533 ..... Administrative Ethics in the
     Public Sector ......................................... 3 credits

7. Students in the health concentration must take the following courses:

   - POLS 551 ..... Health Administration and
     Organization .......................................... 3 credits
   - POLS 552 ..... Health Policy ............................ 3 credits
   - ECON 575 ..... Health Economics ................... 3 credits
   - LAW 291 ..... Legal and Ethical Issues in
     Health Care ......................................... 3 credits

   (Also offered as POLS 593, Problems in Political Science and Public Administration)

8. A thesis option is also available. See the Degree Requirements section for a detailed explanation.

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 at an approved extended degree center.

Independent Study. The independent study is designed to require the student independently to investigate 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 Graduate School, 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 Graduate School 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 Graduate School by the deadline specified in the Academic Calendar and submit a grade for 997-Independent Study to the Office of the Registrar.

Candidacy for the Degree. Admission of a student to the Graduate School 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 the equivalent of one full-time semester (12 semester credits).

2. A GPA of at least 3.00 for all work attempted.

3. The early 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 Graduate School for the supervision of the student’s work.

4. Approval of a Program of Study on a form available from the Graduate School. The program, which should be developed in consultation with the advisor normally early in the second semester, must carry the signature of the student, the advisor, and the program director and must be submitted to the Dean of the Graduate School 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 Graduate School.

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 Graduate School 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 which 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.

Joint MPA/JD Program

Admission Requirements
1. Students are required to apply to both the Law School and the Graduate School 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
Year One—Law School
Year Two—Law School w/two MPA courses*
Year Three—Law School w/two MPA courses
Year Four—Six MPA courses + Independent Study
or
Year One—Seven MPA courses
Year Two—Law School
Year Three—Law School w/two MPA courses*
Year Four—Law School w/one MPA course + Independent Study
*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 32 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 Graduate School).

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 only 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 which can be used as cognates in the MPA program and MPA courses which can be used as electives in the JD program.

Joint MPA/JD Complementary Courses

**LAW**

LAW 150 .......... Constitutional Law I
LAW 152 .......... Constitutional Law II
LAW 201 .......... Agriculture Law
LAW 203 .......... Employment Discrimination Law
LAW 206 .......... Law of Politics
LAW 210 .......... Administrative Law
LAW 263 .......... Environmental Law
LAW 277 .......... Land Use Planning
LAW 281 .......... Legislation
LAW 289 .......... State and Local Government Law
LAW 291 .......... Poverty Law
LAW 291 .......... Civil Rights
LAW 291 .......... State Constitutional Law
Or other courses with the approval of the MPA Director and Graduate Dean

**POLITICAL SCIENCE & PUBLIC ADMINISTRATION**

POLS 308 .......... Intergovernmental Relations
POLS 404 .......... Urban Politics and Administration
POLS 405 .......... Political Behavior
POLS 502 .......... Problems in State and Local Government
POLS 508 .......... Legislative Executive Processes
POLS 531 .......... Public Administration
POLS 532 .......... Public Policy
POLS 535 .......... Public Organizations
POLS 536 .......... Public Personnel Administration
POLS 538 .......... Public Budgeting and Financial Management
POLS 539 .......... Administrative Law

Or other courses with the approval of the Dean of the Law School

**BSPA/MPA or BA/MPA Program**

Admission Requirements
1. 3.25 GPA, overall and in major.
2. Completion of 90 credit hours.
3. Graduate Record Examination General Test or the Graduate Management Admission Test.

Degree Requirements
1. In year four:
   a. Complete approximately 20 undergraduate hours including prerequisites if necessary.
   b. Complete 12 graduate hours (500-level courses are offered on a two-year cycle).
2. In year five:
   a. Complete approximately 10 additional undergraduate hours.
   b. Complete 20 additional graduate hours (500-level courses are offered on a two-year cycle).

Certificate Programs in Public and Health Administration

Three certificate programs are also offered. Each program consists of four three-credit courses that must be taken for a grade and the GPA must be at least 3.0. These programs are open to anyone with an undergraduate degree in any area of study. The certificate programs are offered to those who do not wish to make the initial commitment to a 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 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.

Courses

- POLS 552 ... Health Policy ................................. 3 credits
- POLS 551 ... Health Organization & Administration ... 3 credits
- LAW 291 ... Legal and Ethical Issues
  in Health Administration .............................. 3 credits
  (also offered as POLS 593 Problems in Political Science and Public Administration: Legal and Ethical Issues in Health Administration)
- ECON 575 . Adv Special Topics: Health Economics ... 3 credits

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.
Take four of the following:

**Courses**

- POLS 531 ... Seminar: Public Administration ....... 3 credits
- POLS 533 ... Administrative Ethics in the Public Sector ........................................ 3 credits
- POLS 536 ... Public Personnel Administration ....... 3 credits
- POLS 538 ... Public Budgeting and Financial Administration ..................................... 3 credits
- POLS 539 ... Administrative Law ........................................ 3 credits

**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 sector. 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.

Take four of the following courses:

- POLS 500 ... Research Methods ........................................ 3 credits
- POLS 501 ... Political and Public Policy Analysis .... 3 credits
- POLS 532 ... Public Policy ............................................. 3 credits
- POLS 502 ... Seminar: Problems in State and Local Government ................................ 3 credits
- POLS 508 ... Legislative and Executive Processes ...... 3 credits

**Courses**

- 500. Research Methods. 3 credits. Prerequisite: 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.
- 501. Political and Public Policy Analysis. 3 credits. Prerequisite: Political Science 500 or consent of instructor. 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.
- 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.
- 509. 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.
- 531. Seminar: 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.
- 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.
- 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.
- 535. Public Organizations. 3 credits. Description and analysis of bureaucratic organizations with particular emphasis on concepts and characteristics common to public bureaucracies.
- 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.
- 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.
- 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.
- 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.
- 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.
- 580. Administrative Internship. 1 to 3 credits. Prior approval of instructor required before enrollment. Students are employed on full-time or part-time basis in on-the-job learning situations in federal, state, or local government. Students are required to make an analytical report on some facet of their work.
- 591. Readings in Political Science and Public Administration. 1 to 3 credits. Prior approval of instructor required before enrollment. Selected readings with oral and written reports.
- 593. Problems in Political Science and Public Administration. 1 to 3 credits. Prior approval of instructor required before enrollment. Students study special topics under the direction and supervision of a member of the staff.
- 595. Professional Development in Public Administration. 1 credit repeatable to 3. Specific issues will vary but topics will focus on the latest issues, trends, problems facing administrators, especially those in public and not-for-profit agencies.
- 404. Urban Politics and Administration. 3 credits.
- 405. Political Behavior. 3 credits.
- 433. The Administrator and Public Affairs. 3 credits.
- 508. Intergovernmental Relations. 3 credits.
- LAW 291. Legal and Ethical Issues in Health Administration (Also offered as POLS 593 Problems in Political Science & Public Administration: Legal and Ethical Issues in Health Administration) 3 credits. Deals with aspects of the law related to health care delivery such as compliance and liability issues. Also discusses issues of bioethics.
- ECON 575. Health Economics. 3 credits. The macroeconomy of health care as a driving force of health care policy in America is discussed. The microeconomy of the health care unit is presented in applied areas to develop the focus of organizational decision making.

**Reading Education**

(See Education: Reading Education)

**Social Work**

**Professors:** Barkdull (Graduate Coordinator), Bruno, Haga, Heitkamp (Chair), Kraft, Quinn and Woehle

**Program Description**

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.

The Master of Social Work program at the University of North Dakota is accredited by the Council on Social Work Education. The Council on Social Work Education (2002) states, “The purposes of social work education are to prepare competent and effective professionals, to develop social work knowledge, and to provide leadership in the development of service delivery systems. Social work education is grounded in the profession’s history, purposes, and philosophy and is based on a body of knowledge, values, and skills. Social work education enables students to integrate the knowledge, values, and skills of the social work profession for competent practice.”

All MSW students must complete foundation and advanced generalist concentration social work courses. Foundation courses may be completed either through a CSWE accredited Bachelor of Social Work program or the UND MSW part-time distance program. Advanced generalist concentration courses may be completed through
the full-time on-campus program or the part-time distance program. The full-time program can be completed in a maximum of two years and the part-time program can be completed in a maximum of four years.

Admission

Admission Requirements for Foundation and Concentration Program

Admission requirements for the foundation courses offered through the part-time distance degree program are:

1. Satisfactory completion of a bachelor's degree from a regionally accredited institution.
2. Completion of the Advanced Generalist Concentration portion of the MSW program.
3. A course with human biology content.
4. A grade of C or higher in a statistics course prior to entering the Advanced Generalist Concentration portion of the MSW program.
5. Willingness to abide by the National Association of Social Worker's Code of Ethics and the University of North Dakota Code of Student Conduct.
6. An undergraduate GPA of 2.75 overall or a GPA of 3.00 in the last two years of the undergraduate program.

Admission Requirements for Advanced Standing

Applicants for advanced standing must meet the following standards:

1. BSW from a CSWE accredited program.
2. An undergraduate GPA of 2.75 overall or a GPA of 3.00 in the last two years of the undergraduate program.
3. A course with human biology content.
4. A grade of C or higher in a statistics course.
5. Willingness to abide by the National Association of Social Worker’s Code of Ethics and the University of North Dakota Code of Student Conduct.

Admission Process

Applicants complete the Graduate School application and obtain three references. The forms are available online at: www.graduateschool.und.edu. Applicants submit a 3-5 page personal statement (the essay described in the Graduate School application) covering:

1. Motivation for being a social worker.
2. Values and beliefs regarding social work.
3. Experience with diversity.
4. Qualities the applicant brings to the profession.
5. Professional goals.

Applicants also submit a resume. Finally, the Graduate School requires submission of two official copies of all academic transcripts, including undergraduate and graduate coursework. They must arrive in envelopes sealed by the registrar.

All materials are submitted to the Graduate School, which then transmits the materials to the Department of Social Work.

Admission Schedule

MSW Generalist Foundation Part-Time Distance Degree, September 15 of the previous year.

MSW Advanced Generalist Concentration Full-time On Campus, January 15.

MSW Generalist Foundation Part-Time Distance Degree, November 15 of the previous year.

After the review process is complete, the Department of Social Work will continue to accept applications if the cohort is not full.

Program Requirements for Students Completing Both Foundation and Concentration Courses

1. Successful completion of 60 credit hours of courses approved by the social work faculty with at least a 3.00 grade point average. The number of electives required is dependent on whether a student selects the independent study or the thesis option.
2. Satisfactory completion of foundation courses (24 credit hours).
3. Satisfactory completion of the advanced generalist concentration courses (36 credit hours).
4. Completion of SWk 997, an independent study and comprehensive exam, or SWk 998, a thesis.
5. Completion of at least 24 semester credits with UND. Transfer credits must be obtained in a CSWE accredited program, and a maximum of 15 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.
7. Part-time students will meet the residency requirement by enrolling in a minimum of 18 credits in a two-year period, including at least one summer with a minimum of six credit enrollment on campus in Grand Forks and participation in field seminars near the end of their program.

Program Requirements for Advanced Standing Students

1. Successful completion of 36 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 the advanced generalist concentration courses (36 credit hours).
3. Completion of SWk 997, an independent study and comprehensive exam, or SWk 998, a thesis.
4. Completion of at least 24 semester credits with UND. Transfer credits must be obtained in a CSWE accredited program, and a maximum of 15 credits will be allowed for transfer.
5. 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.
6. Part-time students will meet the residency requirement by enrolling in a minimum of 18 credits in a two-year period, including at least one summer with a minimum of six credit enrollment on campus in Grand Forks and participation in field seminars near the end of their program.

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 course. 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.

3. The final comprehensive examination is completed in the last semester of enrollment.

Candidacy for the Degree. Please see descriptions of the requirements for candidacy for both thesis and independent study options.

Social Work Organizations. For information regarding licensing and professional organizations and student organizations, check the Department of Social Work web page.

Courses

501. HBSE I. 2 credits. Prerequisite: Admission to the MSW program. Prerequisite or corequisite: SWK 507. Social work theory and research, with ecological/social systems theory as the conceptual framework. Basic psycho-socio-cultural aspects of individual and family development.

502. HBSE II. 2 credits. Prerequisite: Admission to the MSW program. Prerequisite or corequisite: SWK 507. Social work theory and research, with ecological/social systems theory as the conceptual framework. Psycho-socio-cultural aspects of group, community, and organizational development.

503. GP with Individuals and Families. 2 credits. Prerequisite: Admission to the MSW program. Prerequisite or corequisite: SWK 501. Generalist social work practice with individuals and families, in the context of the ecological systems perspective, using the problem solving process with a strengths perspective. Evaluation of practice.

504. GP with Treatment and Task Groups. 2 credits. Prerequisites or corequisites: SWK 501, SWK 502. Generalist social work practice with treatment and task groups, in the context of ecological systems perspective, using the problem solving process with a strengths perspective. Evaluation of practice.

505. GP with Communities and Organizations. 2 credits. Prerequisite or corequisite: SWK 502. Generalist social work practice with communities and organizations, in the context of ecological systems perspective, using the problem solving process with a strengths perspective. Evaluation of practice.

506. Social Policy. 2 credits. Prerequisite: Admission to the MSW program. The history of social work and social policy. Foundation social policy analysis.

507. SW Research Methods/Analysis. 2 credits. Prerequisite: Admission to the MSW program. Qualitative and quantitative social work research methods.

515. GP Field Instruction I. 3 credits. Prerequisites or corequisites: Admission to field, SWK 516. Application of foundation coursework in field practicum placement, focusing on entry into organizations and beginning work with individuals and families. S/U grading only.

516. GP Field Seminar I. 1 credit. Corequisite: SWK 515. Integration of foundation coursework in field practicum placement.

517. GP Field Instruction II. 5 credits. Prerequisites or corequisites: SWK 515, SWK 518. Application of foundation coursework in field practicum placement, focusing on generalist practice with the problem solving process with all system levels and evaluation of practice. S/U grading only.

518. GP Field Seminar II. 1 credit. Corequisite: SWK 517. Integration of foundation coursework in field practicum placement. Regular grading.

527. AG HBSE I. 2 credits. Prerequisite: Admission to the Advanced Generalist Concentration. Theories and research regarding complex situations to guide advanced generalist practice with individuals and families. Building on systems and complexity theory, with a strengths perspective.

528. AG HBSE II. 2 credits. Prerequisite: Admission to the Advanced Generalist Concentration. Theories and research regarding complex situations to guide advanced practice with groups, communities, and organizations, building on systems and complexity theory, with a strengths perspective.

529. AG Research Methods and Analysis. 2 credits. Prerequisite: Admission to the Advanced Generalist Concentration. Qualitative and quantitative research analysis and communication of results.

530. AGP with Individuals. 2 credits. Prerequisite or corequisite: Admission to the Advanced Generalist Concentration, SWK 527, SWK 529. Advanced generalist social work practice with individuals, regarding complex situations, using evidence based practice.

533. AGP with Families. 2 credits. Prerequisites or corequisites: Admission to the Advanced Generalist Concentration, SWK 527, SWK 529. Advanced generalist social work practice with families regarding complex situations, using evidence based practice.

534. AGP with Treatment Groups. 2 credits. Prerequisites or corequisites: Admission to the Advanced Generalist Concentration, SWK 527, SWK 528, SWK 529. Advanced generalist social work practice with treatment groups regarding complex situations, using evidence based practice.

535. AGP with Communities. 2 credits. Prerequisites or corequisites: Admission to the Advanced Generalist Concentration, SWK 528, SWK 529. Advanced generalist social work practice with communities regarding complex situations, using evidence based practice.

536. AGP with Organizations. 2 credits. Prerequisites or corequisites: Admission to the Advanced Generalist Concentration, SWK 528, SWK 529. Advanced generalist social work practice with organizations regarding complex situations, using evidence based practice.

580. AGP Field Instruction I. 5 credits. Prerequisites or corequisites: Admission to field, SWK 581. Advanced generalist field practicum placement in human service organization, focusing on application of advanced level knowledge, values, and skills in the context of an organization, development of professional self, and evaluation of practice. S/U grading only.

581. AGP Field Seminar I. 1 credit. Corequisite: SWK 580. Integration of other coursework into field practice.

582. AGP Field Instruction II. 5 credits. Prerequisites or corequisites: SWK 580, SWK 583. Advanced generalist field practicum placement with more independent practice, demonstrating leadership. S/U grading only.

583. AGP Field Seminar II. 1 credit. Corequisite: SWK 582. Integration of other coursework into field practice.

593. Individual Study. 1-2 credits, repeatable for a maximum of 4 credits. Prerequisites: Consent of instructor. Variable topics in social work related areas carried out individually or in small groups under the supervision of the instructor.

997. Independent Study. 2 credits.

998. Thesis. 1-4 credits, total of 4 credits required in thesis option.

Sociology

Professors: Badahdah, Dricoll, Minnotte, Moen, Staples, Stevens, Stofferahn (Graduate Program Director) and Tiemann (Chair)

Program Description

Thirty graduate credits, including thesis work, are required for a Master of Arts degree. The program of study is divided into four components: scholarly tools, core curriculum, cognate, and thesis. The core courses include sociological thought, social theory, research design, and analytical methods. Courses in the scholarly tools component include one course in statistics and other courses in research methods. The cognate includes nine credits in a minor or cognate; and thesis is comprised of four credits.

Admission Requirements

1. Completion of 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.

2. 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

1. 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. This is fulfilled upon successful completion of (grade B or higher) in Soc 510, Soc. 511, Soc. 520, Soc. 521, and EFR 516.

2. One graduate seminar.

3. Other cognates of a student’s own choosing may be approved by their faculty advisory committee.

4. Under exceptional circumstances, where the spirit of residency is met, the Department may waive the residence requirements for an M.A. in Sociology. (See the Academic Policies section for a definition of Residence.)
Courses

500. Professional Seminar. 1 credit. Prerequisites: Admission to the graduate program in Sociology. The course is intended as an introduction to graduate studies, the university and to the opportunities in the discipline of Sociology.

510. Sociological Inquiry. 3 credits. This course focuses on the processes by which sociologists perceive, understand, and study social phenomena.

511. Contemporary Sociological Theory. 3 credits. An examination and comparison of the major current sociological theories.

512. Advanced Sociological Theory. 3 credits. Prerequisite: Sociology 511. A critical look at problems of theory development and construction, emphasizing historical social theorists.

520. Advanced Research Design. 3 credits. Prerequisites: Sociology 323 and 326. This course emphasizes the development of research design skills including survey research.

521. Advanced Analytical Methods. 3 credits. Prerequisites: Sociology 323, 326, and 320. 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.

528. Seminar in Research Methods. 2 to 4 credits. Prerequisite: Sociology 323. An examination of special topics in the field of research methods.

537. Graduate Cooperative Education. 3 credits. Prerequisites: Program of study committee and Director of Graduate Studies approval. A practical work experience with an employer closely associated with the student’s cognate area.

538. Seminar in Social Organization. 2 to 4 credits.

558. Seminar in Social Disorganization. 2 to 4 credits.

568. Seminar in Social Psychology. 2 to 4 credits. Prerequisite: Sociology 361.

598. Individual Research. 1 to 4 credits. Maximum of six credits.

998. Thesis. 4 to 9 credits.

407. Political Sociology. 3 credits.

431. Organizations and Behavior. 3 credits.

435. Racial and Ethnic Relations. 3 credits.

436. Social Inequality. 3 credits.

437. Population. 3 credits.

450. Deviant Behavior. 3 to 4 credits.

492. Practicum in Sociology. 3 credits.

494. Readings in Sociology. 1 to 5 credits.

Space Studies

Professors: Gaffey (Interim Chair), Hardersen (Graduate Program Director, distance), McLaughlin, Rygalov and Seelan (Graduate Program Director, campus)

Program Description

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.

Facilities for Graduate Research

The department manages an observatory complex ten miles west of Grand Forks. The site includes four 10-inch Meade telescopes, three permanent telescope piers, and a 16-inch Meade telescope that is part of an experimental remotely-operated observatory. Work is underway to design a large, professional observatory at the site. A SuomiNet GPS station links UND to a global network focused on geodetic and atmospheric research.

The requirements for admission to the Space Studies degree program are as follows:

1. Bachelor’s degree from an accredited college or university with an overall grade point average (GPA) of 3.0 or better.
2. One semester of coursework in statistics or calculus with a grade of B or better.
3. Two semesters of coursework in the physical sciences, life sciences, or engineering with a grade of B or better.
4. Two semesters of coursework in the social sciences, history, business, or law with a grade of B or better.
5. One semester of coursework in English composition or technical writing with a grade of B or better.
6. Take 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.
7. Submission of a writing assignment in the Space Studies Admission Packet. The writing assignment admission requirement stated above will require that:
   a. The student selects one topical area of space studies. Topical areas include: Global Change, Planetary Sciences, Earth System Science, Space History, Space Policy and Astronomy.
   b. Within each topical area two papers are provided to the student on the www.space.edu web site.
   c. Students are required to include a 500-word writing assignment with the UND Graduate School Admission packet. For each topical area, a short description of what the student is expected to discuss in the assignment is provided on the www.space.edu web site at http://www.space.edu/admissions.asp.

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. Students seeking assistantships should apply by February 1 as decisions on appointments are made in March. 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

Master of Science

Non-Thesis Option

1. SpSt 997 (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)

The Department of Space Studies offers graduate studies leading to the Master of Science degree. The program is designed to prepare students for careers in the academic, commercial, and governmental sectors of the rapidly growing field of space exploration and development. The department manages an observatory complex ten miles west of Grand Forks. The site includes four 10-inch Meade telescopes, three permanent telescope piers, and a 16-inch Meade telescope that is part of an experimental remotely-operated observatory. Work is underway to design a large, professional observatory at the site. A SuomiNet GPS station links UND to a global network focused on geodetic and atmospheric research.
Distance students must also complete SpSt 595, Capstone (3 credits) in the summer before they intend to graduate.

### Thesis Option

1. SpSt 593 (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 Graduate School or department.

### 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 science, engineering, space business, space law, space policy, science, space science, space history, or military space can be accommodated. To complete a cognate or minor at the master’s level, students must take SpSt 501, along with two other courses for nine semester hours of credit. Our department will work with those doctoral students whose department requires additional credits for a minor degree.

### Courses

**Check http://www.space.edu for course updates.**

#### 500. Introduction to Orbital Mechanics. 3 credits. Prerequisites: SpSt 200 undergraduate, SpSt 501 graduate. 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 student an ability to converse, as managers and co-workers, to those individuals who are calculating these difficult orbits. This appreciation is important in both the civilian and military sides of the space program.

**501. Survey of Space Studies I.** 3 credits. A broad, multidisciplinary survey of human and robotic exploration of space. The course will introduce the student to the key policy, business, military, economic, management, planetary science, life science, and engineering issues that characterize today’s space ventures. Emphasis is on building up the fundamental knowledge base that will form the basis for interdisciplinary analysis later in the program. While focus is on the U.S. space program, international space activities are prominently featured in terms of cooperation and competition for the United States. SpSt 501 is a prerequisite/co-requisite to all other 500 level courses and should be taken at the first available opportunity.

**502. Survey of Space Studies II.** 3 credits. Prerequisite: SpSt 501. Readings, discussion and integrative analysis of past and current issues in Space Studies. Emphasis is on a case study approach to develop an interdisciplinary understanding of space programs and initiatives. An individual project will build integrative and critical analysis skills and an appreciation for the interdisciplinary approach, while a team project will engender the interdisciplinary team work typical of the real world. Must be taken at the first available opportunity after taking SpSt 501.

**506. Advanced Orbital Mechanics.** 3 credits. Prerequisites: SpSt 500 and Math 266 or equivalent. 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.

**515. Human Factors in Space.** 3 credits. A review of the major stress experienced by humans on entering the new and alien environment of space. Examples will be taken from the physiological and psychological 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.

**519. Closed Ecological Systems for Life Support.** 3 credits. Prerequisites: SpSt 501 or permission of instructor. 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 functioning during long-term remote confined missions; and the importance of these cycles, as a target link, main integrator and core, affecting 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.

**627. Extraterrestrial Resources.** 3 credits. Prerequisites or corequisites: SpSt 420 and SpSt 501 or SpSt 520 or permission of instructor. This course focuses on the in situ, 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.

**530. Volcanism: A Planetary Process II.** 3 credits. Prerequisites: SpSt 501 or consent of instructor. Volcanism is a fundamental process in the evolution of planetary bodies. In this course graduate students will explore volcanism and its role in planetary evolution through readings from the primary research literature. In particular, observational evidence and physical models for various volcanic processes will be developed and analyzed. The whole gamut of volcanic process in the solar system will be discussed. The course will be conducted in a seminar format and participation in discussion will be the primary form of interaction. Students will develop a research paper on an area of their choosing. A field trip to a planetary analogue site will be arranged if sufficient interest is expressed by students.

**540. Space Economics and Commerce.** 3 credits. Prerequisites: SpSt 501 or permission of instructor. 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/biogeochemical cycles, life support based on physiological/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 these cycles, as a target link, main integrator and core, affecting 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.

**541. Management of Space Enterprises.** 3 credits. Prerequisites: SpSt 501. This course investigates the management of space organizations. These include organizations that are public and private, R&D and operations, profit and non-profit, 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 R&D and operations.

545. Space and the Environment. 3 credits. Prerequisites: SpSt 501 and SpSt 430 or 565. 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.

551. History of the Space Age. 3 credits. This course introduces students to the history of human endeavors in space. This includes the development of rocketry, the influence of amateur societies and science fiction, the military development of ballistic missiles, and human and robotic spaceflight.

552. History of Astronomy and Cosmology. 3 credits. Prerequisite: SpSt 501 or consent of instructor. 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.

555. Military Space Programs. 3 credits. Pre- or corequisite: SpSt 501. 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.

560. Space Politics and Policy. 3 credits. Pre- or corequisite: SpSt 501 or consent of instructor. 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.

561. Public Administration of Space Technology. 3 credits. Prerequisites: SpSt 501, and SpSt 560 or 541. 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.

565. Space Law. 3 credits. Pre- or corequisite: SpSt 501 or consent of instructor. 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.

570. Advanced Topics in Space Studies. 1 to 3 credits. Lecture, discussion and readings on advanced topics of current interest. May be repeated if the topic is different.

575. Remote Sensing Law and Policy. 3 credits. Corequisite: SpSt 501. 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 Ice Core Project. Remote sensing litigation that has begun to address various applications of remote sensing will also be considered. Cases include Dow v. US and EOSAT vs NASA and NOAA.

590. Space Studies Colloquium. 1 credit. A series of lectures presented by visiting lecturers and faculty. May be repeated for up to 2 credits. Graded as pass/fail.

593. Individual Research in Space Studies. 1 to 3 credits. Individual student projects designed to develop advanced knowledge in a specific area of expertise. Written report is required. May be repeated for up to 6 credits.

595. Space Studies Capstone. 3 credits. The capstone course integrates, extends and applies knowledge learned in earlier Space Studies courses and reading. The major component of this course is a collaborative project inter-relating policy, technology and science. This course is required by SPACE.EDU students and should be taken during the year they plan to graduate. The course begins in the spring semester and concludes with an intensive seven-day capstone experience on the UND campus.


998. Thesis. 6 credits. S/U grading only. Prerequisites: Graduate standing in Space Studies, completion and approval of a thesis proposal. An original research project approved by and completed under the supervision of a thesis committee.

405. Advanced Space Mission Design. 3 credits.

410. Life Support Systems. 3 credits.

420. Space Science and Exploration. 3 credits.

425. Observational Astronomy. 3 credits.

430. Earth System Science. 3 credits.

435. Global Change. 3 credits.

450. International Space Programs. 3 credits.

**Course Designations**

**Policy area courses:** 450, 540, 541, 545, 551, 552, 555, 560, 561, 565, 575.

**Technical area courses:** 405, 410, 420, 425, 430, 435, 460, 500, 506, 515, 520, 521, 522, 523, 524, 526, 527, 538, 550, 552.

**Special Education**

(See Education: Special Education)

**Speech-Language Pathology**

(See Communication Sciences and Disorders)

**Teaching and Learning**

(See Education: Teaching and Learning)

**Theatre Arts**

**Professors:** Burgess, Cutler (Graduate Program Director), Reissig, McLennan (Chair) and Williams

**Program Description**

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 of performance, directing, and technical theatre.

**Admission Requirements**

1. Twenty-three credits of undergraduate coursework in theatre, drama, or a related discipline.

2. If previous academic work is judged deficient, certain courses may be required by the department, without graduate credit, as a condition of admittance.

**Degree Requirements**

1. The following are required:

   *Thea 500 Advanced Topics in Production and Criticism* 2 credits

   *Thea 501 Seminar in Dramatic Literature* ...... 6 credits

   *Thea 503 Dramatic Theory and Criticism I* ..... 3 credits

   *Thea 504 Dramatic Theory and Criticism II* .... 3 credits

   Total ........................................... 14 credits

2. Minimum of six credit hours in the production areas, i.e., Acting, Directing, and Design and Technical Theatre courses.

3. All students must take a written comprehensive examination before enrolling in Theatre Thesis 998. The content of the examination will be determined by the Graduate Faculty of the department and will be given at a time announced by the department. The examination shall cover the field of knowledge in Theatre Arts and coursework completed by the student.


**Courses**

500. Introduction to Research in Theatre Arts. 2 credits. Bibliography, research methods, academic writing, and resource materials for graduate work in Theatre Arts.

501. Seminars in Theatre Arts. 1 to 3 credits, repeatable. Seminars in Dramatic Theory, Theatre History, Dramatic Literature, Performance Theory and topics of special interest to faculty and students on the graduate level.

502. Seminar in Dramatic Production and Criticism. 3 credits. Prerequisite: consent of instructor.

503. Dramatic Theory and Criticism I. 3 credits. Historical survey of critical thinking of the drama as performance from Aristotle to late 19th century. Emphasizes differing perspectives on dramatic theory and criticism through time. F/2
525. Period and Style in Dramatic Production. 3 credits. Prerequisite: Theatre 425 or equivalent. Study of a wide variety of production styles in the staging of dramatic literature from Aeschylus to the present.
537. Graduate Co-op Education. 1-6 credits.
595. Research Problems in Theatre. 1 to 3 credits. Prerequisite: consent of instructor. Individual study under the direction of the graduate faculty.
599. Theatre Thesis. 4 credits.
320. Voice and Movement II. 2 credits.
336. Lighting for Stage II. 2 credits.
339. Production Design. 3 credits.
372. Advanced Acting II. 3 credits.
404. Acting for the Music Theatre. 3 credits.
415. Selected Problems in Theatre Arts. 1 to 3 credits.
420. Voice and Movement IV. 2 credits.
422. American Theatre History. 3 credits.
423. History of the Theatre: Classical, Medieval, and Renaissance. 3 credits.
424. History of the Theatre: Seventeenth Century to the Present. 3 credits.
425. Play Direction II. 3 credits.
426. Scene Design for the Stage. 3 credits.
427. Costume Design. 3 credits.
471. Advanced Acting Styles. 3 credits.
488. Playwriting. 3 credits.

University Courses (UNIV)

Courses

529. Study Abroad. 1 to 12 credits 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. F, S, SS

Visual Arts

Professors: Fink, Fundingsland, Ganje, Jones (Chair), Luber, Miller, Monsebroten (Graduate Program Director), Paulsen, Smith and Widmer

Program Description

The Master of Fine Arts degree program in Visual Arts is a strongly studio-oriented professional preparation in the media areas of ceramics, drawing, metalsmithing, painting, printmaking, sculpture, mixed media, and time-based media arts. Within and outside the visual arts areas there are many opportunities (and encouragement) for balanced study in art history/theory and supporting disciplines.

Admission Requirements

1. 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 are considered pending availability of resources.
2. 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.
3. Twenty (20) clearly labeled color slides (2” x 2” cardboard or plastic mounted) and/or additional documentation in cd/dvd representative examples of the student’s recent work. The work samples should be submitted to the Art Department Graduate Committee and accompanied by a list containing the viewing sequence, titles, date of completion, dimension (duration), and media.
4. 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.

Degree Requirements

1. The program consists of 60 credits in the following areas:
   - Major Media Area (Ceramics, Painting, Drawing, Metalsmithing, Printmaking, Mixed Media, Timebased Media Arts, or Sculpture) …… 30 credits
   - Art History and Theory* ………………….. 9 credits
     * to include ART 510
   - Electives (including at least 12 credits in art) ……… 18 credits
   - Professional Exhibition ………………….. 3 credits

2. Formal review of the MFA candidate’s work will be conducted by the appropriate faculty at the end of the student’s second and third semesters of the graduate program.
3. Prerequisites to graduation include:
   a. Preparation and presentation of a Graduation Exhibition, which will be a formal presentation of creative work.
   b. Supplementary exhibition materials including artist’s statement and exhibition announcements.
   c. A slide portfolio and/or documentation in cd/dvd of the Graduation Exhibition must be submitted to the Art Department for its permanent files.
   d. Successful completion of Art 510.

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. 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 the faculty member and committee deemed 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.

Candidacy for the Degree. Admission of a student to the Graduate School 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 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 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 departmental comprehensive evaluation. During the course of study, all MFA students will be evaluated twice and recommendations will be made regarding continuation in the degree program.
tion, held near the end of the second semester, is conducted by a committee of three members from the Graduate Faculty of the Art department. 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 Graduate School.

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 formal departmental comprehensive evaluation prior to the end of the semester preceding the semester in which the student expects to graduate (normally the third semester in residence). The evaluation will be conducted by the student’s faculty advisory 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. The results of the evaluation will be filed with the Graduate School and will include a recommendation regarding advancement to candidacy for the MFA degree.

5. Recommendation to the Dean of the Graduate School for advancement to candidacy by the faculty advisory committee.

**Final Evaluation.** The faculty advisory committee will examine and evaluate the student’s performance in the Professional Exhibition, and report the results to the Graduate School 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 a slide portfolio and/or documentation in cd/dvd format of the Exhibition.

**Courses**

501. Sculpture. 1 to 6 credits. Prerequisite: Permission of instructor. Extensive work and study in three dimensional form, media, and methods. Repeatable to 30 credits.

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.

511. History of Art: Graduate Seminar. 1 credit repeatable to 2 credits. Offered S. Explores the theoretical basis for integrated concepts and methods of critical analysis in the visual arts. The course is intended to help students become aware of the major critical perspectives of the discipline and practical issues related to careers in the fine arts. Methodological, critical, and professional projects will be completed by students in the course.

520. Painting. 1 to 6 credits. Prerequisite: Permission of instructor. Individual research and experimentation in painting. Repeatable to 30 credits.

530. Drawing. 1 to 6 credits. Prerequisite: Permission of instructor. Experimentation and elaboration to drawing skills and techniques, both innovative and traditional. Emphasis on individual exploration. Repeatable to 30 credits.

537. Graduate Co-op Education. 1-4 credits. Prerequisite: Graduate standing: approval of Departmental Advisor/Coordinator, with student on file with the Co-op Ed. Office prior to registration, and written permission from the student’s VA graduate committee. An elective opportunity in the VA graduate program toward the MFA to participate in an apprentice experience in one’s selected field of concentration.

540. Printmaking. 1 to 6 credits. Prerequisite: Permission of instructor. Individual research and experimentation in printmaking. Repeatable to 30 credits.

550. Ceramics. 1 to 6 credits. Prerequisite: Permission of instructor. Individual instruction and experimentation in Ceramics. Repeatable to 30 credits.

560. Metalsmithing: Jewelry and Small Sculpture. 1 to 6 credits. Prerequisite: Permission of instructor. Exploration of historical, traditional, and innovative jewelry and small sculpture techniques using non-ferrous metals, gems, and other materials. Repeatable to 30 credits.

570. Mixed Media. 1 to 6 credits repeatable to 30. Prerequisites: Permission of instructor. Individual instruction and experimentation in mixed media.

573. Timebased Media Arts. 1 to 6 credits repeatable to 30. Prerequisite: Permission of instructor. Individual research and experimentation in time-based and media art practice through video, animation, media installation, performance, and/or interdisciplinary art.

581. Workshop. 1 to 6 credits. Prerequisite: Permission of instructor. Special emphasis and encouragement in the use of new materials. Primary course objectives are to be accomplished by bypassing traditional techniques and establishing new approaches to problem solving. Repeatable to twelve credits.

590. Individual Research. 1 to 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. By permission of instructor. Repeatable to twenty-two credits.

599. Professional Exhibition. 3 credits. Prerequisite: Permission of student’s Graduate Committee. Artist statement, preparation, design, installation, and catalog of solo shows.

410. History of Art: Selected Topics. 3 credits.

412. History of Art: 20th Century. 3 credits.

413. History of Graphic Design. 3 credits.

416. History of Art: Renaissance and Baroque. 3 credits.

417. History of Art: Museum Studies Practicum. 3 credits.

419. History of Art: Late 18th through the 19th Century. 3 credits.

423. History of Art: 20th and 21st Century. 3 credits.

424. History of Art: Non-Western Traditions. 3 credits.

490. Individual Research/Special Projects. 1 to 6 credits.
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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 Higher Education. 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.

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MARY WAKEFIELD, Ph.D., Associate Dean for Rural Health and Director, Center for Rural Health
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LARRY ZITZOW, Director, Facilities

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LaurIE BETTING, D.P.T., Assistant Vice President for Wellness
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LYNETTE KRENELKA, Ph.D., Director, Distance Degree Programs
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KAY MENDICK, Director, Women’s Center
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George Seielstad, Ph.D., Director, Northern Great Plains Center for People and the Environment
FACULTY

This list is intended for general public information purposes only and must not be construed as an official or definitive list of faculty members and their tenure or other status. Also, because the number and locations of clinical faculty in the School of Medicine vary with the departmental appointments, only full-time medical faculty are listed. A listing of clinical faculty may be obtained from the school on request.

* associate graduate faculty status
** full graduate faculty status
*** adjunct graduate faculty status

A

ABBOTT, DAVID W., Associate Professor of Clinical Neuroscience; M.D., Tulane University

** ABRAHAMSON, HARMON B., Professor of Chemistry; Ph.D., Massachusetts Institute of Technology

ADAMS, DARLA, Clinical Instructor of Nursing; M.S., University of North Dakota

ALLEN, JON W., Assistant Dean for Medical School, Northeast Campus at Grand Forks, Associate Professor of Internal Medicine; M.D., University of North Dakota

ALLERY, ALAN, Adjunct Assistant Professor of Rural Health, MHA, University of Minnesota

ALLEVA, PATTI A., Professor of Law; J.D., Hofstra University School of Law

** AMES, FORREST E., Professor of Mechanical Engineering; Ph.D., Stanford University

AMUNDSON, MARY, Assistant Professor of Family and Community Medicine; M.A., University of North Dakota

** ANDERSON, CINDY, Assistant Professor of Nursing and Adjunct Assistant Professor of Pharmacology, Physiology and Therapeutics; Ph.D., University of North Dakota

** ANDERSON, ERNEST, Assistant Professor of Aviation; J.D., Hamline University School of Law

** ANDERSON, JULIE, Associate Professor of Nursing; Ph.D., University of North Dakota

* ANDERSON, KATHERINE, Assistant Professor of Teaching & Learning; Ed.D., University of North Dakota

ANDERSON, SHAUNA C., Adjunct Instructor of Pathology; Ph.D., University of Washington

** ANTES, JAMES R., Professor of Psychology; Ph.D., Iowa State University

ANTONENKO, DAVID R., Professor of Surgery; Ph.D., M.D., University of Alberta

** ASKELSON, MARK, Associate Professor of Atmospheric Sciences; M.S., University of Oklahoma

** ASKIM-LOVSETH, MARY KAY, Associate Professor of Marketing; Ph.D., Purdue University

** ATKINSON, MICHAEL, Associate Professor of Occupational Therapy; Ph.D., University of Minnesota

B

* BADAHDAH, ABDULLAH, Assistant Professor of Sociology; Ph.D., Iowa State University

* BAGHERI, FATHOLLAH, Associate Professor of Economics; Ph.D., University of Pennsylvania

* BAKER, MARY ELIZABETH, Assistant Professor of Teaching and Learning; Ph.D., University of North Dakota

* BALDWIN, GAYLE, Associate Professor of Philosophy and Religion; Ph.D., Marquette University-Milwaukee

** BANDYOPADHYAY, BISWANATH P., Professor of Mechanical Engineering; Ph.D., People’s Friendship University, Moscow

* BARNEE, ANAMITRO, Assistant Professor of Chemistry; Ph.D., University of Maryland

* BARKDULL, CAREN L., Assistant Professor of Social Work; Ph.D., University of Utah

BARRENTINE, CARL, Associate Professor of Humanities; D.A., Idaho State University

** BARRENTINE, SHELBY, Professor of Teaching and Learning; Ed.D., University of California-Los Angeles

** BASS, GAIL S., Assistant Professor of Occupational Therapy; Ph.D., University of North Dakota

BATEMAN, CONNIE RAE, Associate Professor of Marketing; D.B.A., University of North Dakota

BEAL, JAMES R., Assistant Professor of Family and Community Medicine; Ph.D., University of Minnesota

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BEATTIE, ROBERT, Verill J. and Ruth Fischer Clinical Professor and Chair of Family and Community Medicine; M.D., University of North Dakota

BECKER, WILLIAM K., Professor of Surgery; Ph.D., M.D., University of Minnesota

* BENEDA, NANCY L., Associate Professor of Finance; Ph.D., St. Louis University

** BENOIT, JOSEPH N., Graduate Dean and Professor of Pharmacology, Physiology and Therapeutics, Ph.D., University of South Alabama

** BENOIT, VIRGIL, Associate Professor of Languages; Ph.D., University of Minnesota

** BERGER, ALBERT, Associate Professor of History; Ph.D., Northern Illinois University

* BERNE, JANE, Associate Professor of Languages; Ph.D., University of Illinois at Urbana-Champaign

BERRY, COLLEEN, Assistant Professor of Languages; Ph.D., Indiana University

BERWALD, OLAF, Assistant Professor of Languages; Ph.D., University of North Carolina

** BETTING, LAURIE A., Adjunct Assistant Professor of Physical Therapy; DPT., University of North Dakota

** BEVELACQUA, ANTHONY, Associate Professor of Mathematics; Ph.D., University of Kentucky

** BIBEL, GEORGE, Professor of Mechanical Engineering; Ph.D., Case Western Reserve University-Cleveland

BIBERDORF, PEGGY, Clinical Instructor of Communication Sciences and Disorders; M.S., Minot State University

** BIEDERMAN, DANIEL, Professor of Economics; Ph.D., University of Kansas

** BIGELOW, TIMOTHY A., Assistant Professor of Electrical Engineering; Ph.D., University of Illinois

** BILLINGS, DAVID A., Assistant Professor of Family and Community Medicine and Clinical Assistant Professor of Obstetrics and Gynecology; M.D., Michigan State University

** BIRGER, C. JUDITH, Clinical Instructor of Statewide Psychiatric Nursing Education Program at Jamestown, College of Nursing; M.S., University of North Dakota

** BJERKE, ELIZABETH L., Assistant Professor of Aviation; M.B.A., University of North Dakota

BJERKE, MARY L., Clinical Assistant Professor of Nursing; M.S., University of North Dakota

** BLACKWELL, J. LLOYD III, Professor of Economics; Ph.D., Georgia State University

** BLAKE, MICHAEL J., Professor of Music; M.Ed., University of North Dakota

** BLEHM, JULIE A., Associate Professor of Internal Medicine and Clinical Associate Professor of Family and Community Medicine; M.D., University of North Dakota

** BORG, KURT E., Assistant Professor; Director, Academic Learning Center; Ph.D., North Carolina State University

BORHIO, ALAN, Instructor of Atmospheric Sciences; B.S., University of North Dakota

BOUCHER, ALVIN O., Adjunct Assistant Professor of Family and Community Medicine; J.D., University of New Mexico

** BOWMAN, FRANK, Assistant Professor of Chemical Engineering; Ph.D., California Institute of Technology

** BRAATHEN, SANDY, Associate Professor of Information Systems and Business Education; Ph.D., University of Minnesota-St. Paul

** BRACE, LARRY, Adjunct Associate Professor of Pathology; Ph.D., University of Illinois

** BRADLEY, APRIL, Assistant Professor of Psychology; Assistant Professor of Psychology; M.S., University of Texas

** BRADLEY, DAVID S., Associate Professor of Microbiology and Immunology; Ph.D., University of South Dakota School of Medicine

** BRAUN, SEBASTIAN, Assistant Professor of Indian Studies; Ph.D., Indiana University

BRIDEWELL, JOHN, Associate Professor of Aviation; MDIV, Southwestern Baptist Theological Seminary

** BRIGGS, BRIAN, Adjunct Assistant Professor of Physical Therapy; M.D., University of Saskatchewan

** BRINKERT, RONALD, Professor of Physical Education, Exercise Science and Wellness; Ph.D., University of Oregon

** BROEDEL, HANS, Assistant Professor of History; Ph.D., University of Washington

** BRONFMAN, JOSHUA, Assistant Professor of Music; M.A., Oregon State University
BROWN, ANN, Assistant Professor of Pathology; M.D., University of North Dakota
BROWN, MICHAEL, Assistant Professor of Surgery; M.D., Ph.D., University of North Dakota
** BROWN-BORG, HOLLY, Associate Professor of Pharmacology, Physiology and Therapeutics; Ph.D., North Carolina State University
BRUCE, JUDITH M., Assistant Professor, Director of Academic Administration; M.A., Central Michigan University
** BRUCE, A. WAYNE, Professor of Pathology, Director of CME and Outreach; Ph.D., University of Minnesota
BRUNO, DAVID, Assistant Professor of Social Work; Ph.D., Wayne State University
BRUD, CHRISTINE, Assistant Professor of Nursing; Ph.D., University of North Dakota
BURD, LARRY J., Professor of Pediatrics and Clinical Neuroscience; Ph.D., University of Minnesota
BURGESS, GAYE, Associate Professor of Theatre Arts; M.F.A., University of Toronto
** BURN, ERIC, Associate Professor of History; Ph.D., University of Illinois-Champaign
** BURNS, ELIZABETH, Professor of Family and Community Medicine; M.D., University of Michigan
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** CAMPELL, KATHERINE, Associate Professor of Accountancy; Ph.D., University of Washington
CARAHER, WILLIAM R., Assistant Professor of History; Ph.D., Ohio State University
CARLSON, DAVID L., Associate Professor of Clinical Neuroscience; M.D., University of North Dakota
** CARLSON, EDWARD C., Chester Fritz Distinguished Professor and Chairperson of Anatomy and Cell Biology; Ph.D., University of North Dakota
CARLSON, STEVEN J., Professor of Accounting and Business Law; Ph.D., University of Arkansas
** CARMICHAEL, JEFFREY, Associate Professor of Biology; Ph.D., University of Georgia
** CARMICHAEL, TAMIE, Associate Professor of English; Ph.D., University of Georgia
CARR, PATRICK, Associate Professor of Anatomy and Cell Biology; Ph.D., University of Manitoba
CARSON, PAUL, Associate Professor of Internal Medicine; M.D., University of North Dakota
** CARSON, SHARON, Professor of English; Ph.D., University of Washington
CAVALLI, MATTHEW, Assistant Professor of Mechanical Engineering; M.S., University of Michigan
CHAE, SUN-MI, Assistant Professor of Nursing; Ph.D., University of California-Los Angeles
** CHALMERS, LYNNE, Professor of Teaching and Learning; Ph.D., University of North Dakota
CHELLIAH, NOAH N., Professor of Internal Medicine; M.D., Christian Medical College, Vellore, South India
** CHEN, TAR-PIN, Professor of Physics; Ph.D., State University of New York-Buffalo
* CHEN, JIHUI (SUSAN), Assistant Professor of Economics; Ph.D., Indiana University
* CHIASSON, KARL, Assistant Professor of Teaching & Learning; Ph.D., University of North Dakota
CHRISTENSEN, STEFFEN, Assistant Dean of Students at Southeast Campus, Fargo and Associate Professor of Obstetrics and Gynecology; M.D., University of Iowa
CHRISTIAN, STEPHANIE J., Clinical Associate Professor of Nursing; B.S.N., University of North Dakota
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COCKAYNE, SUSAN, Adjunct Assistant Professor of Pathology; Ph.D., Brigham Young University
* COLEMAN, MARY L., Assistant Professor of Pathology; M.S., University of North Dakota
** COLLINGS, JOHN, Associate Professor of Mathematics; Ph.D., Washington State University
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COOLEY, MICHELLE, Clinical Instructor of Nursing; M.S., University of North Dakota
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** DEWAR, GRAEME, Associate Professor of Physics; Ph.D., Simon Fraser University
** DICRISTINA, BRUCE, Associate Professor of Criminal Justice; Ph.D., State University of New York-Albany
** DIEZ, C. RAY, Associate Professor of Industrial Technology; D.I.T., University of Northern Iowa
** DIXON, KATHLEEN, Professor of English; Ph.D., University of Michigan
** DONALDSON, SANDRA M., Professor of English; Ph.D., University of Connecticut
** DONG, XQUAN, Associate Professor of Atmospheric Sciences; Ph.D., Pennsylvania State University
DORMAN, SETH, Clinical Instructor of Nursing; B.S.N., University of North Dakota
**H**

* HAGA, MYRNA P., Associate Professor of Social Work; Ph.D., University of Minnesota
* HALCROW, CHERYL LYNN, Assistant Professor of Mathematics; Ph.D., University of North Dakota

HALL, JUDITH, Assistant Professor of Nutrition and Dietetics; M.S., Kansas State University

HAMPAM, NASSER, Assistant Professor, Information Resources; M.S., University of North Dakota

HANLEY, YVONNE M., Assistant Professor of Teaching and Learning; M.S., University of North Dakota

** HANS, BIRGIT, Professor of Indian Studies; Ph.D., University of Arizona

** HANSEN, DEVON, Associate Professor of Geography; Ph.D., University of Utah

** HANSEN, KENNETH, Professor of Accounting and Business Law; J.D., Indiana University of Law

HANSON, DARLENE, Clinical Associate Professor of Nursing; M.S., University of North Dakota

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HARDING, TINA, Instructor of Social Work; M.S., Middle Tennessee State University

HARGREAVES, JAMES, Associate Professor of Internal Medicine and Clinical Associate Professor of Community Medicine; D.O., College of Osteopathic Medicine and Surgery, Des Moines

** HARRIS-BEHLING, ELIZABETH, Assistant Professor of English; M.F.A., University of Arkansas

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HARSELL, CHRISTINE, Clinical Instructor of Nursing; M.S., Syracuse University

** HARSELL, DANA M., Assistant Professor of Political Science; Ph.D., Syracuse University

HART, J. PATRICK, Adjunct Professor of Family and Community Medicine; Ph.D., University of Oklahoma

** HARTMAN, JOSEPH H., Associate Professor of Geology and Geological Engineering; Ph.D., University of Minnesota

HARWELL, TODD S., Adjunct Instructor of Family and Community Medicine; M.P.H., University of Pittsburgh

** HASELTON, JAMES R., Assistant Professor of Pharmacology, Physiology and Therapeutics; Ph.D., University of Miami at Coral Gables

** HASKINS, ANNE, Assistant Professor of Occupational Therapy; M.A., College of Saint Catherine

* HASKINS, JAMES P., Assistant Professor of Finance; Ph.D., Colorado State University

** HEALY, MARGARET, Associate Professor of Educational Leadership; Ph.D., Iowa State University

** HEITKAMP, THOMASINE, Professor of Social Work; M.S.W., University of Wisconsin-Madison

HELGERSON, STEVEN D., Adjunct Professor of Family and Community Medicine; M.D., University of Washington

** HELGESON, LARS, Professor of Teaching and Learning; Ph.D., University of California-Los Angeles

** HELLELOID, DUANE, Associate Professor of Management; Ph.D., University of Washington

** HEUER, LORETTA, Professor of Nursing; Ph.D., University of North Dakota

* HILL, MICHAEL, Professor, Center for People & Environment; Ph.D., University of Sydney, Australia

HILL, STEVEN, Associate Professor of Clinical Neuroscience; M.D., University of North Dakota

** HILL, THOMAS M., Professor of Microbiology and Immunology; Ph.D., University of Colorado Health Sciences Center

HIMLE, MICHAEL, Assistant Professor of Psychology; M.S., North Dakota State University

** HJELMSTAD, KENT, Assistant Professor of Educational Leadership; Ed.D., University of North Dakota

HOFFMAN, KATHERINE, Assistant Professor of Pathology; M.M., University of Mary

** HOFFMANN, MARK R., Chester Fritz Distinguished Professor of Chemistry; Ph.D., University of California

** HOLDEN, VICTORIA, Associate Professor of Communication; Ph.D., University of Minnesota

** HOLDMAN, LINDA, Assistant Professor of Teaching and Learning; Ph.D., University of North Dakota

** HOLLINGWORTH, DAVID, Associate Professor of Management; Ph.D., University of Minnesota

** HOLM, JEFFREY E., Professor of Psychology; Ph.D., Ohio University

HOLZMAN, GREGORY, Adjunct Professor of Family and Community Medicine; M.D., University of Florida

** HOMANDBERG, GENE, Professor and Chair of Biochemistry and Molecular Biology; Ph.D., University of South Dakota-Vermillion

** HORSOEWSKI, MARY LEE, Assistant Professor of Communication; M.A., University of Kentucky

HOSFORD, CHARLES C., Assistant Professor, Office of Medical Education; Ph.D., University of North Dakota

HOSTETTER, JEFFERY, Assistant Professor of Family and Community Medicine; M.D., University of Washington

** HOUDEK, SHERRY, Assistant Professor of Educational Leadership; Ed.D., University of North Dakota

** HOUSEHOLDER, BRIAN, Assistant Professor of Communication; M.A., Wake Forest University

** HUOTON, EVA, Assistant Professor of Counseling; Ph.D., University of Wisconsin-Madison

** HU, WEN-CHEN, Assistant Professor of Computer Science; Ph.D., University of Florida

** HUANG, LUKE HANMING, Associate Professor of Industrial Technology; M.S., Iowa State University

** HUANG, XIAOZHOA, Associate Professor of English; Ph.D., Ball State University

HUBER, JAY, Assistant Professor of Family and Community Medicine; D.O., Texas College of Osteopathic Medicine

** HUME, WENDELIN, Associate Professor and Chair of Criminal Justice; Ph.D., Sam Houston State University

# HUNT, CURTIS D., Adjunct Associate Professor of Anatomy and Cell Biology; Ph.D., University of North Dakota

HUNT, ERICA, Instructor of Family and Community Medicine; M.S., University of North Dakota

HUNTER, SUSAN L., Associate Professor of Nursing; M.S., University of Texas at Austin

HURLAY, ROXANNE, Clinical Associate Professor of Nursing; M.S., University of North Dakota

** IDE, BETTE, Professor of Nursing; Ph.D., University of Arizona

** IAMS, JOEL, Associate Professor of Mathematics; Ph.D., Colorado State University

** IAMS, MICHELE, Associate Professor of Mathematics; Ph.D., University of North Dakota

** INGLE, RONNIE, Assistant Professor of Music; D.M.A., University of North Carolina

** INGWALSON, GAIL, Associate Professor of Teaching and Learning; Ph.D., University of North Dakota

** ISEMMINGER, GORDON L., Chester Fritz Distinguished Professor of History; Ph.D., University of Oklahoma

ISZLER, DONNA, Clinical Associate Professor of Statewide Psychiatric Nursing Education Program at Jamestown, College of Nursing; M.A., North Dakota State University

IVerson, DIANNE, Assistant Professor of Pathology; M.D., University of North Dakota

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