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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 may restrict the release of directory information no later than the tenth class day of the semester, in person, at the Office of the Registrar, Room 203, Twamley Hall.
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 richness of the opportunities students have to work with a highly qualified faculty in an active search for meaning.

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,

[Signature]

Charles E. Kupchella
President
### Academic Calendar (Subject to Change)*

#### FALL SEMESTER 2001-2002 (021) 2002-2003 (031)

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<td>August 28</td>
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#### SPRING SEMESTER 2001-2002 (023) 2002-2003 (033)

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**All academic deadline dates apply to full-term, on-campus courses.**
## 2001-2003 Academic Biennium

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Satisfactory Progress

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

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 to 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 the Office of the Vice President for Student and Outreach Services, 307 Twamley Hall and at the Dean of Students Office, 180 McCannel Hall.

Und Statement on Institutional Diversity and Pluralism

Approved by University Senate February 4, 1993

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, and sexual orientation; of persons with disabilities; and of people from other countries. Of particular importance is the University’s longstanding commitment to support the cultures and traditions of the American Indian people while providing learning and teaching experiences which enhance their 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 disavows 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.

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 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 a 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 Sally J. Page, Affirmative Action Officer, 101 Twamley Hall, P.O. Box 7097, University of North Dakota, Grand Forks, ND 58202-7097; telephone (701) 777-4171 (voice/TDD). Concerns regarding Title VI of the Civil Right Act, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973 (educational opportunity), or the Americans With Disabilities Act may be addressed to the Affirmative Action Officer or to the Office of Civil Rights, U.S. Department of Education, 10220 North Executive Hills Blvd., 8th Floor, Kansas City, MO 64153-1367.

Measles/Mumps/Rubella Immunization

Students enrolled in a course offered for credit at any institution 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 the Student Health Service (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 Service 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.

Disability Access on Campus

The ADA Line

The University of North Dakota is committed to providing access to all people using the campus facilities, programs, and services and encourages people to report their concerns about access by calling The ADA Line at (701) 777-2591 (voice) or (701) 777-2796 (TDD). Callers will be asked to explain the access problem. A written report will be forwarded to the department responsible for dealing with that particular issue. Callers who would like to know how their concern was handled will be asked to give their name and phone number.

Other Resources

Other sources for reporting access concerns and/or requesting accommodations include departmental supervisors or the Affirmative Action Office (701) 777-4171 (voice/TDD) for employment related accommodations; Disability Support Services (701) 777-3425 (voice/TDD) for classroom accommodations; building supervisors for physical access issues; the Housing Office (701) 777-4251 for access concerns in University housing units; the Transportation Office (701) 777-4030 for accessible campus bus service and 777-4122 for State Fleet service; and the Traffic Division (701) 777-3551 for accessible parking permits.

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 www.police.und.edu, or e-mail und_police@operations.und.edu.
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General Information

THE SCOPE OF THE UNIVERSITY

Classified as a “Doctoral/Research University Intensive” 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 11,031 students in the fall of 2000. UND is located in Grand Forks, a city of 50,000 situated across the Red River from East Grand Forks, Minn., 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 146 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 16 programs, the specialist’s degree in one program, the master’s degree in 46 programs).

In the fall of 2000, about 56 percent of UND’s students were residents of the state of North Dakota and about 25 percent were from Minnesota, with remainder representing every other state, Canada and 49 other countries. Some 82 percent were enrolled in UND’s undergraduate programs. The University awarded 2,149 degrees in 1999-2000, including 1,558 undergraduate degrees, 422 master’s or specialist’s degrees, 39 doctoral degrees, 68 law degrees, and 62 M.D. degrees.

Research, scholarship and creative activity make up an important part of life at UND. External grants received by UND in 1999-2000 totaled more than $40.5 million.

The University’s faculty and research staff numbers 492 full-time individuals. Its total full-time workforce of 2,411 makes it the state’s largest employer outside the two U.S. Air Force bases.

UND’s 553-acre campus, regarded as one of the most beautiful in the region, includes more than 230 buildings and 5.6 million square feet space. New facilities since the last catalog are a Barnes and Noble University/community bookstore and the soon-to-be-completed Ralph Engelstad Arena, home of the University’s NCAA Division I ice hockey program. New to Grand Forks is the Alerus Center, a 22,000-seat events and conference facility. It 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, Burtenshaw Theatre, Josephine Campbell Recital Hall, and Hytop 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 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 underway 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. Through these 12 decades 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 endeavors, 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 North Central Association of Colleges and Schools since the Association was organized in 1913. UND received its most recent NCA accreditation in 1994. Most 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: Commission on Institutions of Higher Education, 30 N. LaSalle St., Suite 2400; Chicago, IL 60602-2504; telephone (800) 621-7440 or (312) 263-0456; Fax (312) 263-7462. http://www.ncahigherlearningcommission.org/. E-mail address is info@ncahe.org.

THE ACADEMIC YEAR

The academic year is divided into two semesters, each approximately 16 weeks in length: the first, beginning near the end of August and ending prior to Christmas; the second, beginning in mid-January and extending to mid-May. A Summer Session begins in May and concludes in August. The UND Summer Session offers the variety of four-week, six-week, eight-week, and twelve-week courses and choices of credit and non-credit workshops, institutes, and special programs of various lengths. See the academic calendar on page iv.

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
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. 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 catalog on the worldwide web: www.und.edu/catalogue, or write or call the Office of University Relations, 777-2731.

Tickets: Athletic tickets available at Hyslop Sports Center (fieldhouse) Ticket Office, hours 8:30 a.m. to 4 p.m., Monday-Thursday (telephone 777-2236); 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 to each production, 2 to 5 p.m., Monday through Friday (telephone 777-2587 for tickets; 777-3446 for information). Chester Fritz Auditorium Box Office open from 9 a.m. to 4:30 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 writing or calling the Office of Enrollment Services, telephone 777-4463 or 1-800-CALL UND (ext. 4463). (also see section titled Tours of Campus.

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.

Dining Facilities: Parents are welcome to dine in the three dining centers with their student (guest meal prices available; students may use their Passport Dollars account for guests). Residence Hall dining centers are in Wilkerson, Squires, 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 a.m. to 3:30 p.m. Convenience store service is also available at Wilkerson Convenience Store in Wilkerson Hall, 4 to 11 p.m., Monday-Sunday, and at the Walsh Convenience Store, main level of Walsh, 7 a.m. to 7 p.m., Monday-Friday. Fast food service is available at the Memorial Union Food Court, 7 a.m. to 11 p.m. (Summer/holiday hours may vary), with franchised operations such as Subway, TCBY, Juice Works, and Little Caesars Pizza menu selections available. Other eating facilities, include Subway, Johnstone-Fulton Hall, 11 a.m. to midnight, seven days a week; Wings (Airport) Cafe, UND Administrative Aerospace Center, Airport, 7:30 a.m. to 2:30 p.m., Monday through Friday, providing subs, sandwiches, hot meal entrees, various other offerings. The Medical School Food Court 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. 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 Union Station (traffic and parking administrative 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 infraction will be waived for visitors. Simply complete the visitor section on the ticket and return it to the Union Station within seven calendar days. For further information, call 701-777-3551.

Books and Memorabilia: The University Bookstore, operated by Barnes & Noble, is located on the Bronson Property north of the main campus (725 Hamlie 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 (700) 777-2611, 1-800-543-8764 out-of-state.

TOURS OF CAMPUS 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, to faculty members, and to students, and you can eat in campus dining facilities. 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 arrangements 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, or write to Office of Enrollment Services, Box 8135, Grand Forks, ND 58202. You can also find us on the web at www.unddept/enrolser/.

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 Traffic Division — Union Station (lower level of Memorial Union). It is the responsibility of the individual to properly 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: the stu-
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 an opportunity to broaden and enrich their educational experience. Besides 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 and the Office of Research and Program Development, or through funds provided from external agencies such as Federal or State government, private foundations, and industry. In fiscal year 2000, $41.6 million of external support was received for sponsored program activities, of which $25.8 million was for research.

Major UND research programs include the Child Welfare Research Bureau, Bureau of Governmental Affairs, Bureau of Educational Services and Applied Research, the Social Sciences Research Institute, and the UND Energy and Environmental Research Center. A newly created Center of Excellence in Neurosciences concentrates on the basic sciences behind the causes and progression of neurodegenerative disorders such as Parkinson’s and Alzheimer’s Disease.

Local research agencies and programs which work with UND faculty and students include the Altru Health Institute Child Evaluation and Treatment Program, the U.S. Department of Agriculture Human Nutrition Research Center, and the State of North Dakota Geological Survey.

UND is a major component of the National Science Foundation’s Experimental Program to Stimulate Competitive Research (EPSCoR) in North Dakota. The state received and matched its first EPSCoR grant in 1986, and has received continuous NSF funding since that time.

Further information on research activities can be obtained by calling the Office of Research and Program Development at (701) 777-4278.

AWU Membership: The University of North Dakota is a member of Associated Western Universities, Inc. AWU is a consortium of more than 60 universities that directly supports the Department of Energy’s (DOE) mission to develop and maintain educational and training activities which ensure that the scientific and technical needs of the energy research and development community are met. AWU provides an interface among the academic community, DOE, and its western laboratories. For information regarding AWU, contact the Office of Research and Program Development (701) 777-4278.

ORAU Membership: Since 1989, students and faculty of the University of North Dakota have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 86 colleges and universities and a contractor for the U.S. Department of Energy (DOE), located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education, the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty have access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the Resource Guide, which is available at <http://www.orau.gov/orau/edu.htm> or by calling either of the contacts below.

ORAU’s Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU’s members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Power Junior Faculty Enhancement Awards, the Visiting Industrial Scientist Program, and various services to chief research officers. For more information about ORAU and its programs, contact: Dr. Sally Eckert-Tirolta, ORAU’s Councilor for University of North Dakota (701-777-4278); Ms. Monnie E. Champion, ORAU Corporate Secretary (423-576-3306); or visit the ORAU Home Page <http://www.orau.org>.

LEARNING COMMUNITIES AT UND

There are now three 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. Work and study are organized around a central theme and carried out in a variety of small group settings in which discussion among students and the integration of knowledge are emphasized. The context for each semester’s study is a cluster of 3-5 general education courses. Consult the index to find a fuller description of this learning community. For more information, call the Integrated Studies Program at (701) 777-3622.

The Learning Community at Johnstone-Fulton-Smith (TLC@FS) offers first-year students living in the Johnstone-Fulton-Smith residence hall complex the opportunity to take courses and to study with their neighbors. Students register for a partially common cluster of general education courses and a section of Introduction to University Life which meets in the residence hall complex. A writing consultant, also located in the residence complex, is an added feature for students in this program. Both this program and the Integrated Studies Program include an outdoor experience. More information about this program may be found by calling Student Academic Services (701) 777-2117.
The Honors Program (described below) is a learning community designed for students with an interest in intellectual and creative pursuits. Students can participate in small Honors classes as part of their program of study throughout their undergraduate education. Other educational, social, and service activities extend their learning beyond the classroom experience. Students in any college of the University may enroll in 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 in the University. Students may also enter the Program after the first year; inquiries from interested students are welcome at (701) 777-2219 (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 Coordinator and a University Honors Committee. The Honors Program has its own administrative apparatus and can adjust academic programs to fit the needs and goals of individual students. In response to this flexibility, Honors Program students are expected to demonstrate intellectual excellence in their own lines of interest and to pursue learning independently. Opportunities to do so are offered in Honors colloquia, Honors tutorials, 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 in the Program, special introductory courses are available to familiarize students with the nature of the Program and to acquaint the Honors faculty with the students. Advanced courses, 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 some field of specialization. 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. For students who graduate through the Honors Program, these requirements substitute for the University 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 and critically; to express their thoughts clearly, 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 baccalaureate 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 hours of work 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 interdisciplinary. 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.
University of North Dakota

Tuition, Fees, Financial Information

TUITION AND FEES, 2000-2001*

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Minnesota</th>
<th>Contiguous States</th>
<th>Non-resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate........</td>
<td>$1,544.00</td>
<td>$1,630.00</td>
<td>$1,955.00</td>
<td>$3,719.00</td>
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<tr>
<td>Graduate..............</td>
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<td>1,932.00</td>
<td>2,353.00</td>
<td>3,999.00</td>
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<tr>
<td>Law...................</td>
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<td>1,932.00</td>
<td>2,510.00</td>
<td>4,279.00</td>
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<td>Medicine...............</td>
<td>6,212.00</td>
<td>6,630.00</td>
<td>16,182.00</td>
<td>16,182.00</td>
</tr>
<tr>
<td>Physical Therapy.....</td>
<td>2,639.00</td>
<td>2,807.00</td>
<td></td>
<td>2,639.00</td>
</tr>
</tbody>
</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 2000-01 totaled $242.00 per semester at UND (and is included in the above table). These include the University Fee, which supports, among other functions, musical organizations, the UND Memorial Union, and inter-collegiate athletics, $86.00; health fee, $63.00; student activity fees, allocated by student government for such purposes as concerts and student publications, $20.50; Memorial Union bond retirement, $7.50; McCannel Hall Renovation, $15.00; and technology fee, $50.00. The student activity and bond retirement fees were approved by votes of 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 credit 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 Engineering, Law, and Nursing and for graduate students as indicated in a following section titled “Other Fees.”

OTHER FEES

Application Fee (Undergraduate)...................................... $25.00*
Payable by all undergraduate students applying for admission.

Application Fee for Graduate Students............................ $30.00*

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

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 $500 per semester ($1000 per academic year) will be charged to all aviation students.

Engineering Laboratory Field
Trip Fee (one semester).................................................. as required
Payable by each student enrolled in Civil 481 and Mechanical 380.

Engineering Program Fee
A program fee of $150 per semester ($300 per academic year) will be charged to both undergraduate and graduate students in engineering who have completed 60 semester credits of courses which pertain to an engineering program. A program fee of $25.00 a semester will be assessed to Undergraduate Students in Engineering with less than 60 accumulated credits.

Graduate Student Continuing
Enrollment Fee ......................................................... $30.00 per semester*
$15.00 per summer*
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 publish- ing the abstracts in Dissertation Abstracts.

Graduate Student Copyright Fee...................................... $45.00*
Charged for securing copyright to a dissertation.

Late Payment Penalty.................................................... $25.00*
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 $500 per semester ($1000 per academic year) will be charged to all law students.

Nursing Program Fees
For all students newly admitted to Nursing, a program fee of $150 per semester ($300 per academic year) 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 ($1000 per academic year; pro-rated for part-time students) will be charged to all graduate students. Family Nurse Practitioner and Anesthesia graduate students have three semesters and will be charged $1500 per academic year.

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

Parking Fee........................................................................ 30.00**
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 $15.00 and new summer session students pay $7.50. Fees are subject to change.

Special Examination for Credit
Fee per Semester Hour .................................................... % of the regular credit hour fee
*Non-refundable; subject to change

ESTIMATED YEARLY EXPENSES

The following table gives an estimate of the expenses of a single, undergraduate student residing on campus during the nine month, 2000-2001 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 States</th>
<th>Non-resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and Fees</td>
<td>$3,088.00</td>
<td>$3,260.00</td>
<td>$3,600.00</td>
<td>$7,438.00</td>
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<tr>
<td>Room and Board**</td>
<td>3,562.00</td>
<td>3,562.00</td>
<td>3,562.00</td>
<td>3,562.00</td>
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<td>600.00</td>
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<td>600.00</td>
<td>600.00</td>
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<tr>
<td>Personal Expenses</td>
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<td>2,600.00</td>
<td>2,600.00</td>
<td>2,600.00</td>
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<tr>
<td>Total Estimated Costs</td>
<td>$9,850.00</td>
<td>$10,022.00</td>
<td>$11,152.00</td>
<td>$14,200.00</td>
</tr>
</tbody>
</table>

*Plus matriculation fees ($25.00 one time)
** Costs based on UND residence hall rates (double room and 14 meal contract)

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 time schedule of classes. For purposes of determining residency, a resident student is defined by law as follows:

1. A person less than 18 years of age whose custodial parent or guardian has been a legal resident of North Dakota for 12 months immediately prior to the beginning of the academic term;
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 dependent child whose parent or guardian has been a legal resident of North Dakota for 12 months immediately prior to the beginning of the academic term or resides in the state with the intent to establish residency in the state for a period of years (Applicant must be claimed as a dependent on the parent or guardian’s most recent federal tax return);
4. A person who graduated from a North Dakota high school within 6 years immediately prior to the beginning of the academic term;
5. A full-time active duty member of the armed forces assigned to a military installation in North Dakota (does not include National Guard or reserve members);
6. A spouse or dependent of a full-time active duty member of the armed forces assigned to a military installation in North Dakota (does not include National Guard or reserve members);
7. A dependent of an instructor who lives in North Dakota and teaches in any institution of higher education in the state (instructor with faculty or equivalent professional status);
8. The spouse of any person who is a resident for tuition purposes;
9. 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 residence 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. This rate is determined by averaging the tuition costs of the North Dakota and Minnesota state university systems. All UND students from Minnesota are included. To be certified for reciprocity at UND, Minnesota students must (1) file UND’s standard admission application, and (2) file a reciprocity participation application with the Minnesota Higher Education Services Office, Reciprocity Program, 1450 Energy Park Dr., Suite 350, St. Paul, MN 55108-5227. Reciprocity applications are available at the Office of Admissions. 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 2000-01 would have totaled $4,390 instead of the normal $7,438 in non-resident tuition and fees 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 non-residents. 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 830.2.
2. Institutional charges shall be refunded according to a schedule approved by the Chancellor that provides for a percentage refund, which approximates the amount the institution must return to the Title IV financial aid programs.
3. A student must withdraw officially from the University within the stated refund period to be eligible for a refund of tuition and fees. No refund will be made to a student who is suspended, dismissed, or expelled for breach of discipline.
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 830.2 (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)

Students dropping a class during the first seven instructional class days of the semester will receive a 100% refund of tuition and fees. After the seventh class day of the semester there is no refund for a class which is dropped. However, classes of the same or fewer credits may be substituted at no additional tuition/fee charge. If the substituted class requires a special course fee, the student will be assessed that charge.

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 on the basis of academic performance and potential. Grants are outright 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 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 employment are paid from funds allocated to individual University departments. Financial need is not a requirement. All students who work through FWS and/or institutional 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, Nursing Student Loan, Primary Care Loan. The Minnesota Student Educational Loan Fund (SELF), Canadian Higher Education Loan Program (CanHELP) and commercial education-al 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 private loans is available at the Financial Aid Office.

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

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 60 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 achieve-ment determine the recipients of more than 1850 undergraduate scholar- ships totaling over $1,215,500 per year. These vary in amounts up to $2,500 per academic year, although most are $250.

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

Scholarships to entering freshmen are usually limited to students who rank in the upper ten percent of their graduating class and who have ACT scores commensurate with this rank. Graduating class rank is nor-mally based on seven semesters of high school work. 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.

UND awards a maximum of $2,500 in scholarship assistance per recipient each year from all University funds, except for the Student Financial Aid Office, the Student Financial Aid Office, and the UND Foundation.

New students may be considered for all undergraduate scholarships by completing the Honor Scholarship Application form which may be requested by contacting the Office of Enrollment Services. Current students should complete the Returning Student Scholarship Application form which may be requested by contacting the Student Financial Aid Office. Scholarship applications are also available on the internet at: http://www.und.edu/dept/finaid.

Only one application is required to apply for an academic scholarship. Students are matched with scholarships on the basis of previous academic records and information provided on the scholarship application.

**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). For more information or an application, contact the Student Financial Aid Office.

**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 2001-2002 school year, grants range from $400 to $3,750. The exact amount of a Pell Grant depends upon the student’s need and the money appropriated by Congress to fund the program in any given year. Students can receive this grant for the period required for completion of the first undergraduate baccalaureate degree.

Supplemental Educational Opportunity Grants (SEOG) are available to undergraduate students who qualify for the Pell Grant and meet the priority deadline. Eligible students enrolled at least half-time may receive grants up to $600 per year.

The North Dakota Student Financial Assistance Program provides non-repayable grants to North Dakota residents to aid undergraduate stu-dents 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 for all aid, complete all applications for the Program, you must complete the FAFSA and/or apply for the Student Grant Program at least one eligible North Dakota college code on the FAFSA. The deadline for priority consideration is February 15. For 2001-2002 students who were awarded a Student Financial Assistance Grant received $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 com-
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. April 15 is the priority deadline at the University of North Dakota. To receive top consideration for all programs, students are advised to complete the FAFSA by mid-March as it takes approximately one month for processing. Students must submit the FAFSA or Renewal FAFSA each year.

The Student Financial Aid Office awards aid to the neediest students who have a complete file by April 15. After that date, students’ files are considered by date of FAFSA 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 during the 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.

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: undergraduate 187, graduate 135, medical 218 and law 135; and 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 may be obtained from the Student Financial Aid Office.

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.
Student Services, Support Programs and Activities

ACADEMIC SERVICES
(see Student Academic Services)

ADMISSIONS OFFICE
205 Twamley Hall
Phone (701) 777-3821
(701) 777-4566 TTY Service Only

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, as well as newly admitted students to the professional Schools of Law and of Medicine and Health Sciences, 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 program; Rehabilitation Act of 1973, Sections 503 and 504; Titles VI and VII of the Civil Rights Act of 1964; Age Discrimination in Employment Act; Title IX of the Education Amendments of 1972; and the Americans with Disabilities Act as well as responsible for compliance with Federal and State laws and regulations involving civil rights, equal employment and equal educational opportunity. Under equal employment and equal education opportunity, the University declares that it will not discriminate on the basis of race, color, religion, sexual orientation, national origin, sex, age and otherwise encourages the inclusion of members of minority groups (African-American, Hispanic, Asian, Native American), women, disabled persons, 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. Complaints related to the Family Educational Rights and Privacy Act may be addressed to the Affirmative Action Office.

Students are encouraged to use the resources in the Affirmative Action Office regarding minority, women, and disability issues and to consult with the Affirmative Action Officer concerning discrimination problems. Those individuals who believe that they have been victims of unlawful discrimination are encouraged to contact the Affirmative Action Officer for UND’s grievance procedures covering discrimination.

ALUMNI ASSOCIATION AND FOUNDATION
J. Lloyd Stone Alumni Center
Strinden Center
Phone (701) 777-2611

The University of North Dakota has a proud tradition of alumni achievement and loyal and dedicated alumni and friend support. Alumni and friend involvement has provided a “margin of excellence” for many of the programs offered by the University of North Dakota. Two private, non-profit organizations, the UND Alumni Association and the UND Foundation, have responsibility for coordinating alumni relations and fund raising programs. Policies for the Association and the Foundation are set by a 24-member Board of Directors. Program and office operations are under the direct supervision of an Executive Vice President. The Association and Foundation are headquartered in the J. Lloyd Stone Alumni Center (formerly Oxford House), the historic, restored home of early UND presidents and in the Strinden Center, 3100 University Avenue.

The Alumni Association and Foundation have a unique working relationship which differs from similar organizations at many colleges and universities. Both organizations are managed by the same board of directors and the same executive vice president. The Foundation receives private gifts for the benefit of the total University of North Dakota and also acts as a trustee in deferred giving arrangements and for named endowment funds. The staff of the Alumni Association conducts all fund raising activities for the Foundation. The Alumni Association and the Foundation work together to achieve their common goals.

In conjunction with the 1983 University of North Dakota Centennial, the Alumni Association and Foundation conducted a Centennial Endowment National Campaign which raised over $26 million in direct, pledged, and deferred gifts. This was followed in 1991-92 with a “Thank You, President Tom Clifford Campaign” which resulted in gifts and commitments exceeding $25 million. The Foundation recently completed the “21st Century Campaign,” a five-year effort launched in July 1995, raising $50 million in new gifts, pledges and commitments. The Foundation manages assets in excess of $130 million, much of which is endowed for perpetual support of scholarships, faculty enhancement programs, and other priority needs at the University of North Dakota.

Over the years, the University of North Dakota alumni have been generous in supporting their Alma Mater and have assisted several major University projects, including the establishment of a number of scholarship and loan funds, providing for faculty awards, and making possible in part or total several buildings on the University of North Dakota campus. This includes financial support for the UND Memorial Union, a swimming pool in the original Fieldhouse, the Winter Sports Center, the Ray Richards Golf Course, the Chester Fritz Library, the Chester Fritz Auditorium, Gamble Hall, the Hughes Fine Arts Center, Ireland Cancer Research Laboratory, Burtness Theatre, and the Fox Service Complex. In 1993 the UND Foundation completed a successful drive which raised over $4 million for the construction of a Bio-Information Learning Resources Center for the UND School of Medicine and Health Sciences. UND alumni and friends have also made contributions for research and lectureships and have given financial support to many activities on the UND campus, including music and athletics. The Alumni Association and Foundation administer more than 1,800 separate accounts to facilitate private contributions to support every college, department and activity at UND.

In 1981 TELESIS, a student alumni group, was established to involve students in alumni activities and to give current students contact with outstanding alumni achievers.

ART MUSEUM
(see North Dakota Museum of Art)

ATHLETICS
(see Intercollegiate Athletics)

AUDITORIUM
(see Chester Fritz Auditorium)
CAREER SERVICES CENTER
280 McCannel Hall
Phone (701) 777-3904

Career Services’ goal is to assist students and alumni in planning for and carrying out their job searches. This is accomplished through individual and group assistance in job search techniques, resume/letter writing, and interviewing skills. A division of Career Services, Cooperative Education, 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. Our 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 our data base, and be able to sign up for Cooperative Education opportunities and on-campus interviews.

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

The University Children’s Center offers child care to parents who are students or employees at UND and also to parents of the greater Grand Forks community. The Center serves children ages 2½-5 years old. Children who attend Kindergarten in the public school are also served half-days. The Center is open five days a week, 7:30 a.m. to 5:30 p.m., during the UND academic year and summer session. Children in first through third grade are also served at 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 each 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 or are students-in-training from the Early Childhood Education Department at UND. The Center is accredited by the National Academy of Early Childhood Programs and licensed by the North Dakota Department of Social Services.

For more information, you are welcome to come to 525 Stanford Road for a tour and visit. Call (701) 777-3947 or write the University Children’s Center, Box 9026, Grand Forks, ND 58202-9026.

COMPUTER CENTER
Upson Hall
Phone (701) 777-3171

The UND Computer Center 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 mathematical, statistical, and programming languages; use NSF supercomputers; as well as supplement research by examining databases and current information throughout the world.

Computer 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, mainframe consulting, local area network (LAN) consulting, electronic mail, Internet access, and network services.

The Help Center provides a single contact point for users who need help with computing problems or questions. Services from the Help Center include telephone (701) 777-2222 and drop-in (Upson II, room 366), and e-mail (cc_helpdesk@mail.und.nodak.edu) problem determination, assistance, and answers to users’ common computing questions. The Help Center telephone is answered from 5 a.m. to 11 p.m., seven days a week. Most forms needed to request access to any ND-HECN or UND system are available online, at the reception counter in the Computer Center Office, or call the Help Center for further information.

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

The Counseling Center 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.

Center services may be requested by visiting 200 McCannel Hall anytime between 8:00 a.m. and 4:30 p.m., Monday through Friday, or by calling (701) 777-2127. A receptionist will direct your request or inquiry to the appropriate staff person and/or set up an appointment for you. Services are available M-F, 8:00-4:30. Limited evening hours and services also are available at the Community Center.

All Center services are free of charge except where otherwise indicated. All contacts are confidential.

The specific Counseling Center services are as follows:

Individual Counseling and Therapy. The Center 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.

Testing Service. The administration of the College Level Examination Program (CLEP) and numerous graduate or professional school entrance examinations (GRE Subject Exam, LSAT, MCAT, etc.) is done by the Testing Service. In addition, the administration and interpretation of career, self-assessment, or ability inventories is available through the Center. 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. This service offers guidance through four areas: Career Walk-In Center, Individual Career Counseling, Career Presentations, and a Career Decision-Making Course.

Substance Abuse Prevention Program. Educational programming, individual and group counseling, referral to community treatment agencies, and informational workshops are offered through this Center program. In addition, a resource library for use by students, faculty, and staff is located in the Counseling Center.

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.
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. Recreational 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, religious, 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 is available from the Student Organization Center in the Memorial Union.

FINANCIAL AID OFFICE
(see Student Financial Aid Office)

FOOD SERVICE
(see Residence Services)

FRATERNITY AND SORORITY MEMBERSHIP

Thirteen national social fraternities and seven national social sororities maintain houses adjacent to the campus in which residence and dining facilities are available to members. Costs for room and board are approximately $2,300 (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 within the framework of University policy. 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, University of North Dakota, Grand Forks, ND 58202-8136 (701-777-3667) or greeklife@und.nodak.edu or check out our website at www.union.nodak.edu/union/greeklife/greeklife.htm.

GENERAL COUNSEL, OFFICE OF
104 O’Kelly Hall
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 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 Gamma Sigma (1926) elects to membership a limited number of academically outstanding students from the primary disciplines in Business Administration.

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

Delta Pi Epsilon (1963) is the national honorary graduate fraternity for students of superior scholastic achievement in business education.

Delta Theta Phi (1948) promotes awareness of the role of the woman in the community and to further the objectives of the fraternity.

Epsilon Phi 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) focuses on 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 (IHLUAC) recognizes exceptional apartment leaders.

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

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

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.

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

Phi Alpha Theta (1948) aims to recognize excellence among those enrolled in the study 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 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 majors participating 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 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.
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) 777-4231
FAX (701) 777-4773
oip@sage.und.nodak.edu
www.und.nodak.edu/dept/iconline

The UND Office of International Programs supports and develops academic programs on campus and abroad to help prepare students to deal effectively with the growing interdependence of the world as well as provides UND’s international population with a variety of immigration and student services. Our goal is to promote and enhance the understanding of different countries and cultures.

To achieve these goals, the Office provides the following services:
• Advises international students, faculty, and staff on immigration, personal, and acculturation needs;
• Sponsors intercultural events and promotes International Organization activities;
• Coordinates the International Student Exchange Program (ISEP), through which UND students may study at one of more than 100 universities throughout the world;
• Coordinates UND exchange programs in several countries around the world;
• Advises students on study abroad programs not associated with UND;
• Provides information on Fulbright grants and other international faculty exchanges and development programs;
• Advises International Studies majors and minors;
• Sells International Student Identification Cards and Hosteling International cards.

The Office of International Programs is composed of a Director, Associate Director, International Student & Scholar Specialist, and an administrative secretary.

The Office of International Programs is located in the International Centre. Office staff are available from 8 a.m. to 4:30 p.m. The International Centre is open daily from 8 a.m. to 11 p.m., including weekends and holidays. Computers, comfortable study space, coffee, and tea are always available. All are welcome.

INTRAMURAL-RECREATIONAL SPORTS
261 Hyslop Sports Center
Phone (701) 777-4330

Intramural-Recreational Sports offers a diverse array of competitive and non-competitive sports to all UND students, faculty, and staff in men’s, women’s, and co-recreational.

Sports include: aerobics, badminton, basketball, sand volleyball, broomball, flag football, golf, hockey, in-line hockey, racquetball, soccer, softball, tennis, and volleyball. Intramural-Recreational Sports is administered and officiated by students, with facilities including the Engelstad Arena, Hyslop Sports Center, Ray Richards Golf Course, and the use of Grand Forks Parks and Apollo Park Softball Complex.

Intramural-Recreational Sports fosters a spirit of competition and sportsmanship within an avant-garde recreation program with activities to enhance personal physical and mental health. For information, call (701) 777-4330 or come by Room 261, Hyslop Sports Center.

LABORATORY EDUCATION FOR NORTH DAKOTA (LEND) PROGRAM
School of Medicine and Health Sciences
Phone (701) 777-3201

The LEND program mission is to deliver quality and contemporary information and experiences for clinical laboratory professionals to rural communities in North Dakota and the region. The program includes course offerings to laboratory professionals by distance learning for graduate, undergraduate, and continuing education credit. Each year the LEND program has over 1,200 participants at 70+ sites throughout North Dakota. The program is an important link for lifelong continuing education opportunities for residents of North Dakota.

LEARNING CENTER, UNIVERSITY
201A 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 skills assistance is available in the following areas: (1) Individual assistance, (2) Drop-in tutoring, (3) Credit courses, (4) Workshops in skill development areas, (5) Study skills videos, (6) Resource material and handouts. The services provided by the University Learning Center are free of charge to students.

The University Learning Center accepts applications for peer tutors throughout the year.

The Center is open M-F, 8 a.m.-4:30 p.m and provides consultation for students, staff, and faculty.

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 and maintains the North Dakota State Department of Public Instruction’s Special Learners Collection. 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: http://www.und.edu.

MEMORIAL UNION
Phone (701) 777-3926
(701) 777-4482 TTY Service Only

The Memorial Union provides a host of services to the University community, including meeting rooms from small to ballroom size, teleconference facilities, Service Center/Copy Stop (check cashing, newspapers, photocopying, fax), Off Campus Student LIFE Center, Craft Center, and Sign and Design Studio. Food service options include: Subway, TCBY, Juice Works, Little Caesars, the Terrace Dining Center, and Campus Catering. Space in the Union for meetings or displays may be reserved by calling Central Scheduling at (701) 777-3928 or by stopping in on first floor. Another service offered at the Union is Info Center, which has information on most University events and services on a walk up or phone in basis ([701] 777-4321). The Lifetime Sports Center, located on the ground floor, offers billiards, electronic darts, ping pong, coin operated games, and television lounges. Outdoor equipment rentals, including canoes, camping equipment, and cross country skis, are also available. Leadership and personal development as well as advising of campus organizations are provided by the Leadership Development Program, Student Organization Center, and Greek Life departments. Also located in the Union are Student Government, University Learning Center, the Computer Learning Labs, University Credit Union, the Union Station parking services office, and Campus Barbies.

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
(see North Dakota Museum of Art)

NATIVE AMERICAN PROGRAMS
317 Cambridge Street
Phone (701) 777-4291

The Office of Native American Programs (NAP) is designed to promote and foster the academic and personal success of American Indian students enrolled at the University of North Dakota. NAP 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 UNDby 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 NAP. The student support component provides both academic and personal advisement. NAP will also assist new and transfer students with University orientation, early registration process, academic advisement, financial aid and scholarship information, general information, referral resources, and becoming involved in the peer advisor program. 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. NAP also sponsors study skills, time and money management, and writing workshops. The SEMTECH Center provides opportunities for students to enhance their computer skills.

The Native American Center itself houses NAP and the SEMTECH CENTER. The Native American 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.

NORTH DAKOTA MUSEUM OF ART
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 Cafe. 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, 1 p.m. to 5 p.m. There is no admission charge.

NORTHERN LIGHTS PUBLIC RADIO
KJFM 90.7 FM
KUND 1370 AM
314 Cambridge
Phone (701) 777-2577

The University operates two radio frequencies. The station was first licensed in 1923 as a “land wireless” station. Northern Lights Public Radio offers music programming highlighting local arts, culture, issues, and events important to the listeners in the Greater Grand Forks Community. The stations’ format is a mix of contemporary music including blues, jazz, pop, folk, world music and emphasizes locally hosted and programmed shows.

Northern Lights Public Radio works locally to provide listeners with a unique public radio service, building on a history of public radio that began on the UND campus more than 75 years ago. Northern Lights offers professional radio opportunities for students as well as opportunities for volunteers to get involved in local radio.

PERSONNEL SERVICES, OFFICE OF
313 Twamley Hall
Phone (701) 777-4361

The Office of Personnel Services supports a fair and equitable work environment by providing management and development training to supervisors, a fair and effective salary administration program, a broadening 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 Personnel Services adheres to the University’s equal opportunity/affirmative action policies. Additional information on employment at the University may be obtained from the Office of Personnel Services, Box 8010, Grand Forks, ND 58202, telephone (701) 777-4361; or e-mail personnel_services@mail.und.nodak.edu, or visit our website at www.und.edu/org/ops. The Office of Student Financial Aid (see page 17) should be contacted by students seeking part-time employment.

Additional information on employment at the University may be obtained from the Office of Personnel Services, Box 8010, Grand Forks, ND 58202 or E-mail to personnel_services@mail.und.nodak.edu. The Office of Student Financial Aid (see page 17) should be contacted by students seeking part-time employment.

**RESIDENCE SERVICES**

**DINING SERVICES**

The University has three dining centers serving meals on a contract basis (board is required in all residence halls except Biek Hall’s super singles). The Dining Centers are located in Wilkerson Hall, Squires Hall, and the Memorial Union. Open dining allows students to eat at any of the three dining centers. Students living off-campus, as well as faculty and staff, are eligible to purchase a board plan and eat at any dining center.

Fast food is available at the Food Court located on the main level of the Memorial Union. The Food Court menu selections are from national- ly known franchised foods like Subway, TCBY, Juice Works, and Little Caesars Pizza. The Twamley Snack Bar is located on the fourth floor of Twamley Hall, the Medical Science Snack Bar is located in the atrium of the School of Medicine and Health Sciences, the Wings Café is located on the 5th floor of the UND Aerospace Administration Building at the Airport, and a second Subway is located in Johnstone Hall. Both Wilkerson and Walsh Hall offer a convenience store on the basement level. There is also a convenience store located on the main floor of the Memorial Union.

Private dining rooms and banquet services are also available for students, faculty, groups, and others associated with the University. Contact the Campus Catering Office (701) 777-2256.

Complete information about Dining Services may be obtained by visiting our website at www.dining.und.edu or calling (701) 777-3823.

**HOUSING**

Student living facilities at the University of North Dakota include University residence halls, single student apartments, and family housing apartments.

**University Residence Halls**

University residence halls are designed to provide a comfortable and diverse living environment for students while they are enrolled in the University and to promote the personal and social development of students through group living. Each residence hall has a hall director who is assisted by resident assistants. Each hall elects its own hall council which promotes a program of social, educational, and recreational activities. Complete information may be obtained by visiting our web site at www.housing.und.edu or by writing to the Housing Office, University of North Dakota, Box 9029, Grand Forks, ND 58202-9029.

**Applications.** Applications are sent, on request, from the Enrollment Services Office or the Housing Office. Students may also print an application from our website at www.housing.und.edu. Assignments are made in accordance with the established priority system which is determined by the date of the receipt of the $25 nonrefundable 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 semesters) or for the entire summer session. The student 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 State Board of Higher Education. The cost of a double room with a 19-meal board plan was $3,614 for the 2000-01 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 without written consent from the Associate Director of Residence Halls 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. Only enrolled University students may live in UND residence halls.

Facilities. All residence halls meet modern standards of health, fire, and sanitation. Furnishings include study desks, single beds (mattresses are 36” x 80”), dressers, chairs, drapes or blinds, bookshelves, mirrors, wastebaskets, and bulletin boards. Laundry facilities and mail service are also provided. Students will need to bring bed linen, blankets, study lamps, towels, bedsprads, and pillows. Telephone lines are provided; however, the student will need to bring his/her own phone. Each residence hall room is equipped with high-speed, direct connection to the Internet.

University Apartments

The University maintains several hundred apartments for families and single students. Residents have easy access to the University Children’s Center 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 write the Housing Office, University of North Dakota, Box 9029, Grand Forks, ND 58202-9029. Early application is encouraged. Assignments are made in accordance with the established priority system which is determined by the date of receipt of the $100 application fee/deposit ($25 nonrefundable application fee and $75 deposit).

Single Student Housing

The University maintains furnished and unfurnished apartments and sleeping rooms for single students. Leaseholders must be senior, graduate level, or 26 years of age or older. Rental rates on these units ranged from $256 to $471 for the 2000-01 academic year. In most cases, the rent includes heat, water, garbage removal, and basic cable TV (electricity and telephone not included).

Family Student Housing

The University reserves 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 $256 to $589 for the 2000-01 academic year. In most cases, the rent includes heat, water, garbage removal, and basic cable TV (electricity and telephone not included). All family housing apartments are furnished. The largest family which can be accommodated in a three bedroom apartment is seven people.

Off Campus Housing

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

SPEECH, LANGUAGE AND HEARING CLINIC

Montgomery Hall
Phone (701) 777-3232

The Department of Communication Disorders offers clinical evaluations and treatment for speech, language, and hearing disorders. These services are provided by faculty or by graduate and undergraduate 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 conducts a program of on-going evaluation and therapy on an outpatient basis. Moderate fees are charged for this service. Some of the specific services provided are evaluations of all types of speech handicaps, language disabilities, and hearing problems and evaluations for hearing aid candidacy. Treatment is also provided in all of these areas.

Referrals to the clinic can be made by anyone for individuals of any age. Those who wish evaluations, consultations, or training can make appointments by calling the Speech, Language and Hearing Clinic.

STUDENT HEALTH SERVICE

100 McCannel Hall
Phone (701) 777-4500

The Student Health Service includes a full-service medical clinic that provides medical evaluations, treatment, laboratory, x-ray and pharmacy services, and health education programs. It is designed to meet the health needs of all enrolled students. Spouses of enrolled students may use the Health Service for a per-semester fee. Faculty and staff may be treated under job-related emergency conditions. Medical service, including that for children, is available at the UND Family Practice Center, telephone 780-6800 for appointments. Please let Family Practice know that you are a UND student.

Students are not charged for office calls. The cost is covered by the per-semester Health Fee. There is no limit to the number of visits per semester. There is a charge for medications, laboratory and x-ray services, and for special examinations, usually at a rate that is less than in the community. Most charges are billed through the University Business Office; however, Student Health files claims for most health insurance plans, including those with pharmacy coverage.

The Student Health Service is located in McCannel Hall. Regular school year hours are 8 a.m. to 4:30 p.m. by appointment, Monday through Friday. Call 777-2605 for an appointment.

STUDENT FINANCIAL AID OFFICE

216 Twamley Hall
Phone (701) 777-3121
sfa@mail.und.nodak.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 Student Financial Aid Office 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 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 need assistance or information should con-
The Division of Student and Outreach Services upholds and complements the mission of the University of North Dakota by providing support for quality educational opportunities while taking a leadership role of offering services to a diverse study body of lifelong learners and in communicating and extending the resources of the University to local, state, national, and international constituents.

STUDENT ACADEMIC SERVICES
Room 2, O’Kelly Hall
Phone (701) 777-2117

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

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

By providing quality academic advising for all students deciding on a major, the staff within Student Academic Services is committed to offering the tools necessary for student success at the University.

SUBSTANCE ABUSE PREVENTION, OFFICE OF Counseling Center
200 McCannel Hall
Phone (701) 777-2127
A.D.A.P.T. (701) 777-4165

The Office of Substance Abuse Prevention is actively involved in developing, implementing, and presenting workshops and programs which help students make responsible, positive decisions regarding addictive and other high risk behaviors. In addition, information and assistance is provided to students who have questions or concerns about alcohol or other drug use, co-dependent behavior, adult children of alcoholics experiences, or other addictive tendencies. The Alcohol and Drug Abuse Prevention Team (A.D.A.P.T.), staffed by Peer Educators, offers a variety of wellness related presentations which increase awareness of how alcohol and other drugs affect attitudes, decisions, relationships, and the university environment. For students needing alcohol and/or drug evaluations (self or court referred) the Office is a licensed facility which employs a Licensed Addiction Counselor.

TELEVISION CENTER
Rural Technology Center
Phone (701) 777-4346
Fax (701) 777-4342

The mission of the University of North Dakota Television Center 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.

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 (701) 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. The Television Center does not rent or loan equipment to groups, organizations or individuals.

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.

Approximately 2 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. Prairie Public Television, North Dakota’s Public Television Network, also carries Studio One. 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.

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 website (www.und.edu/dept/studio 1) or call us at (701) 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 earned a bachelor’s degree) and economically disadvantaged students. The program provides academic assistance with individual and small group tutoring; review classes in math, science, and English; 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.
TRIPS OFF CAMPUS

Representatives of student organizations are allowed to be absent from classes for approved trips and activities. Each student must make satisfactory make-up arrangements with his or her instructors, before the event if possible. No off-campus activities or performances by student organizations are permitted during the period of semester examinations.

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 principal home page on the World Wide Web, http://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 “University Letter” and “UND Dimensions,” brochures and other printed materials, videocassettes, 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.

WOMEN’S CENTER

305 Hamline Street
Phone (701) 777-4300
Fax (701) 777-2307
undwomenscenter@und.nodak.edu
www.und.nodak.edu/dept/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” (discussion-based programs), “Lunch & A Video,” 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. Conferences and programs relative to celebrating the lives of women are held periodically throughout the academic school year. A lending library, resource room, and computer/study area are available for students. The Women’s Center is open Monday through Friday from 8:00 a.m. to 4:30 p.m.

WRITING PROGRAM

12A Merrifield Hall
Phone (701) 777-3600

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. The Writing Center (Merrifield 12) 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 daily, 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

Write: Enrollment Services, P.O. Box 8135
Grand Forks, ND 58202-8135

ONLINE: www.rdb.und.nodak.edu/www_ea/plsql/ea_blank

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

Graduate Student Applications

Write: Graduate School, P.O. Box 8178
Grand Forks, ND 58202-8178

ONLINE: www.und.edu/dept/grad/admissns.html

Telephone: (701) 777-2945
(800) CALL UND, ext. 2945
(701) 777-2947 TTY Service Only

Visit and Tour Arrangements

Write: Enrollment Services, P.O. Box 8135
Grand Forks, ND 58202-8135

Telephone: (701) 777-4463
(800) CALL-UND, ext. 4463
(701) 777-3367 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 at schools and college fairs, tours of the UND campus, and personal contact over the telephone 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: Enrollment Services Office, Box 8135 University Station, University of North Dakota, Grand Forks, ND 58202. The office telephone number is 701/777-4463. The application form can also be obtained on the web at www.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 four categories: Regular Admission (full-time or part-time); Transient Admission; Undergraduate Non-Degree Admission; or Audit Admission. See below for definitions of these admission categories. For provisions governing admission to the Law School and medical studies in the Medical School, applicants should consult the respective bulletins of those schools.

Types of Admission

Regular Admission is granted to a student who has entirely 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.

Transient Admission. A transient student is one who is in good standing at another college or university and who enrolls at the University for a summer session or one semester only and plans to transfer the credits earned to apply toward a degree at the other institution. Transient students do not qualify for financial aid. Credit earned as a transient student may be applied toward a UND degree if the student qualifies for Regular Admission.

Undergraduate Non-Degree Admission. Students who defer Regular Admission while they enroll in a course(s) for purposes other than the completion of a degree may enroll as Undergraduate Non-Degree students. Students enrolling with this status are not eligible for federal financial aid and may not exceed a total of 12 semester hours of credit as Undergraduate Non-Degree students. Enrollment in courses beyond 12 semester credits will be contingent upon Regular Admission after satisfying all entrance requirements.

Audit Admission. Students who plan only to enroll in university classes as auditors will be admitted as auditors and have a status and responsibility in class distinctly different from that of those taking the course for credit. Students wishing to enroll in university classes as auditors must seek and receive the prior consent of the instructor concerned. Anyone enrolling without such consent may be cancelled from the class by the instructor. An auditor is not required to participate in the oral or written work of the class. He or she takes no examinations and receives no credit for the course. He or she is identified to the instructor concerned as an auditor on the official class list. An auditor may not later establish credit in that course by taking a special examination. The course must be repeated as UND institutional credit to earn credit. While a student cannot fail an audit, an instructor may file a “W” (withdrawn) for non-attendance.

Admission of New Freshmen

Students applying for admission to UND are required to take one of the standardized college entrance exams. The American College Test (ACT) is preferred, though the SAT is also accepted. Standardized test scores at UND are used for scholarships and advisement, as well as admission criterion. Students 25 years old or older are not required to have test scores. It is recommended that students take the ACT late in their junior year or early in their senior year.

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.

Enrollment Services Office provides assistance and counseling to students from countries other than the United States. International students 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 525 on the Test of English as a Foreign Language to be considered for admission. TOEFLcomputerized tests completed after June 1998 require a minimum score of 195. The International Programs Office provides assistance and counseling to students from countries other than the United States. International students should write to the International Program Director as well as to the Office of Admissions.

Canadian students are required to have completed Grade XII and to meet high school core curriculum admission requirements. They must also complete the ACT (preferred) 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 Scholastic Aptitude Test (SAT) may request official test scores be mailed to the Office of Admissions from SAT in Princeton, N.J. 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. Test scores are required for admission, as well as for evaluating applications for loans and scholarships.

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 progress 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 Examining their status for credit 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. The minimum score for Math 102 will be 18 whereas Math 103 will require a minimum score of 20. In some cases, students may request credit in Math 102 through CLEP. CLEP scores will be accepted under the following conditions: 

**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 “undecided” 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, Box 8135 University Station, University of North Dakota, Grand Forks, ND 58202 or on the web at www.und.edu.

2. All applicants are required to complete and return the application for admission to the Office of Admissions with the $25.00 non-refundable application fee. In addition, beginning freshmen must request their high school to send an official transcript of their records directly to the Office of Admissions.

3. The freshman applicant is required to take the ACT (preferred) 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:** 1. 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.

2. The application for admission for the fall semester may be submitted any time during the period between the beginning of the senior year and July 1. Application for spring semester should be submitted no later than December 1 prior to the opening of the spring semester and May 15 for the Summer Session. International students are required to apply for admission for the fall semester by April 1 and for the Spring Semester by October 1.

Provided applicants meet all the admission requirements, completed applications received from applicants after the deadlines may be considered for admission to the University by the Director of Admissions.

**Admission of Transfer Students**

Transfer students from other colleges and universities who have earned fewer than 60 semester hours of credit that is 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. Odberg School of Aerospace Sciences, the College of Nursing, and the School of Medicine and Health Sciences (Physical Therapy, Athletic Training, Cytotechnology, Clinical Laboratory Science, Occupational Therapy). 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 stu-
When to Apply: 1. 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. 2. A student should submit an application no later than July 1 prior to the opening of the first semester in the year for which admission is sought. Application for second semester should be submitted no later than December 1 prior to the opening of the second semester. Application for Summer Session should be submitted by May 15. International students must apply by April 1 for the fall semester and October 1 for the spring semester.  

Credit Transfer: Students transferring to the University must have maintained at least a ‘C’ average at the colleges or universities 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 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 Station, University of North Dakota, Grand Forks, ND 58202, or on the web at www.und.edu. 2. Students must complete the application and return it to the Office of Admissions together with a $25.00 non-refundable fee. 3. Students must request that an official transcript from each college attended be forwarded directly to the Office of Admissions, Box 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.

Readmission of Former Undergraduate Students: Former undergraduate students of the University of North Dakota who wish to return must submit a Request for Readmission form to the Registrar’s Office. Those who have enrolled in other institutions must submit official transcripts for evaluation before they will be considered for readmission. (Returning graduate students should refer to the Graduate Bulletin.) The completed Request for Readmission form should be returned to the Registrar’s Office at least one month before the beginning of the semester in which the student expects to return to the University.

Orientation Programs For New Students: The University of North Dakota holds orientation programs for new students (freshman and transfer students) each semester. 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.
Undergraduate Academic Information

INTRODUCTION AND BACKGROUND

This section of the catalog summarizes many of the academic policies and procedures which will apply to the student during his or her undergraduate years at UND. Particularly important are the passages describing the University’s general education requirements. 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 “undecided” 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 be graduated 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 student. 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 Time Schedule of Classes for each term. Registration is the student’s personal responsibility.

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.

The statement 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

Before consulting the University-wide graduation requirements, students are urged to read this statement of philosophy prepared by UND’s General Education Requirements Committee. One aspect of the University-wide requirements for a baccalaureate degree is completion of UND’s general education requirements. This statement places the general education requirements into a broader context and indicates the end results which should be striven for in undertaking a university education.

Introduction

The University of North Dakota provides students opportunities to enrich their lives through a large number of major and minor fields of study designed both for general education and for academic specialization. This dual objective — non-specialized and specialized education — ideally is reciprocal and inclusive. Each kind of education is expected to inform and enrich the other and to contribute to those special qualities and abilities we have come to expect of university graduates.

While the directions and purposes of specialized programs usually are clear, the directions and purposes of general education have often been left undefined. For this reason, the General Education Requirements Committee has defined a number of broad and specific goals to serve as guideposts for faculty proposing and teaching courses designed to fulfill general education requirements and also to enhance students’ understanding of the purposes of a university education.

These broad goals are rooted in a belief that a general education program should help students develop (1) the ability to make informed choices, (2) the ability to communicate effectively, (3) intellectual curiosity and creativity, (4) a continuing commitment to learning, (5) a capacity and interest in serving others, (6) a sense of responsibility both to specific communities and to a culturally pluralistic world, and (7) greater personal satisfaction through access to the larger social, political, economic, scientific, and aesthetic culture.

The specific goals have been organized into two sets. The first set is not tied directly to any particular discipline and gives attention to integration around such abilities as critical thinking, effective communication, creative thinking, recognizing relationships and understanding value formation. The second set is more closely tied to the areas of study included in the general education program: the social and behavioral sciences; mathematics, science and technology; and humanities and the fine arts.

I. Cross-Disciplinary Abilities

A. Critical Thinking

Critical thinking can provide students confidence and assurance to make informed decisions. The processes of dissecting and reassembling ideas can be personally liberating and serve as a powerful means for developing one or more of the following abilities:

1. defining a problem and selecting pertinent information for its solution;
2. recognizing stated and unstated assumptions in order to formulate useful hypotheses;

B. Communication

Students receive instruction in ways of expressing ideas to others. There is an expectation that students will be able to communicate effectively in a variety of settings through different modes of expression — writing, speaking, listening, reading, and using technology.

C. Information Literacy

Students will have access to a wealth of resources in order to become effective members of society and to lead productive and satisfying lives. These resources include libraries, information systems, and web-based databases. Students will learn how to locate, access, evaluate, and use information to pursue their personal, educational, and professional needs.

D. Quantitative Reasoning

Students who are prepared in quantitative reasoning are able to understand and apply numerical data, solve problems, and make decisions using relevant information and strategies. They have a sense of the different kinds of mathematics and the abilities and skills needed for effective use of mathematics.

E. Creative Thinking

Creative thinking, as defined here, is the ability to think in a non-routine manner or to use existing information in new ways. Creativity is shown not only by the originality of ideas but also by the flexibility, fluency, and elaboration of those ideas in order to generate a wide possible range of ideas and solutions.
3. understanding methods of inquiry as they are used in specific disciplines;
4. using imagination and insight to expand an exploratory process;
5. questioning what one has been told; and
6. relating skills to thought and action.

B. Communication
The ability to communicate is the ability to present information, ideas, feelings, and values, in such a way that people may be able to understand one another. Students should learn how to communicate effectively in as many ways as possible.

In order to communicate one must know languages. Each culture and each discipline develops its own language, with unique symbols, terminology, and rules for using its symbols. Students must advance their skills in the use of English, develop abilities to use other languages, and become acquainted with the specialized languages which exist in many areas — mathematics, computer science, graphics, the fine and performing arts, and others.

Communication also depends on experience in expressing oneself through language and experience in interpreting and appreciating what other people are trying to say. General education at the University should provide students with numerous opportunities to express their thoughts, feelings and values through language of all kinds, and to learn how well others have been able to understand them. Communication skills may be taught both by courses specifically emphasizing written and oral expression and interpretation and by courses emphasizing other aspects of the arts, sciences, and humanities.

C. Creative Thinking
While it is unrealistic to expect every student to bring into being original work of extraordinary merit, every person ought to be given opportunities and incentives to think creatively and to attempt creative work. Creative thinking can be encouraged by promoting students' ability and effort:
1. to imagine alternatives to accepted ways of solving problems or formulating questions;
2. to change categories and comprehend analogies;
3. to generate new ideas; and
4. to add details, transform, or extend ideas.

Characteristics of a teaching environment that fosters creativity include:
1. encouragement of risk taking;
2. use of a rich variety of stimuli;
3. support for curiosity, imagination and experimentation;
4. opportunities for self-expression; and
5. tolerance for ambiguity and complexity.

D. Recognizing Relationships
Focusing upon relationships among parts — emphasizes connectedness and interdependency.
Learning to see connections is vital to general education. This process emphasizes:
1. inter-relatedness; conceptualizing links between events, entities and ideas and the larger context in which they occur;
2. inter-dependency; conceptualizing mutual dependency or reciprocity of events, entities, or ideas — seeing that the impact on one part has ramifications for the other parts and for the whole;
3. holism; conceptualizing a totality rather than considering discrete or individual elements that only partially depict that totality; and
4. structure; conceptualizing the underlying and relatively stable relationships that exist among events, entities and ideas which unify any totality.

E. Recognizing and Evaluating Choices
Education concerning values is important in general education — not seeking one right way to behave, but recognizing that choices cannot be avoided. Students should be aware of how many choices they make, how these choices are based on values, and how to make informed choices.

General education courses should deal with at least some of the following issues:
1. how human choices influence the results and dominant values of all disciplines;
2. how these choices have been made in the past;
3. how some of these choices might otherwise have been made; and
4. how choices are made, evaluated, and used to explain phenomena.

F. World Cultures
The University of North Dakota has established a World Cultures course requirement to enable students to:
1. gain an awareness of cultures geographically or historically different from their own;
2. gain an awareness of a language other than their native language;
3. foster a spirit of international understanding;
4. understand cultural systems other than their own;
5. address multi-cultural issues, or
6. learn about race, gender, or ethnicity other than their own.

This requirement will be satisfied according to the following format:
1. World Cultures courses will be taken as part of the General Education Requirements.
2. Students will find the plus sign symbol (+) before each course that meets the World Culture designation.
3. A minimum of three (3) credits of the General Education Requirements must meet the World Cultures designation.

II. Disciplinary Abilities

A. The Behavioral and Social Sciences
General education should include courses that help students understand the complexities and uncertainties of their personal and social environment; its differing goals and expectations, agreements and conflicts, actions and transactions; and how students intentionally and unintentionally can change and control their personal and social environment and be changed and controlled by it.

Specifically, general education in the behavioral and social sciences should give students knowledge about themselves and their human environment at three levels: 1) how human beings behave individually; 2) how individuals are linked to the social environment around them; and 3) how the social environment is organized and influenced by institutions.

For knowledge of individual behavior, general education should help students attempt to understand how human behavior originates, how it is integrated into a continuing and whole personality, and how it can deviate from what is intended or desired. To increase this understanding, general education courses should help students learn about how individuals think, obtain and use information, solve problems, make decisions, are motivated to act, develop over a lifespan, and can demonstrate a broad range of behavior.

For knowledge of the social environment, general education should help students attempt to understand how they are affected by the world around them, how they affect that world, and how they may be able to make intended changes in it. Improved understanding can come from learning about the following issues:
1. how groups of people make decisions intended to direct their own behavior and other people's, or to change the conditions in which they and others live;
2. how the behavior of individuals is socially organized into different patterns of coordinated activity that individuals are obligated to perform;
3. how the cumulative effects of individuals and their behavior have consequences for the environment that individuals have not intended or controlled; and
4. how people produce, expend and exchange social resources, those resources whose existence and usefulness depend on social interaction (such as money, authority, information, or loyalty).

General education should also help students understand how the structure, organization and resources in the social environment depend on social institutions such as family and household life, religion, education, business, politics and health. General education about social institutions should address the origins of institutional characteristics, variations and options, how the institutional characteristics have changed and developed, and what the immediate and long-term consequences of these characteristics may be.
B. Mathematics, Sciences and Technology

General education in mathematics, science, and technology should provide students with knowledge of how human beings try to understand and control the fundamental phenomena and processes of the universe, and do so by means of readily understandable, accurate descriptions and explanations.

Mathematics

General education in mathematics should help students to understand and use mathematics as:

1. an intellectual discipline concerned with such considerations as quantity and space and their relationships;
2. a method of analyzing problems with logic and precision;
3. a way to communicate and interpret information provided by others; and
4. a continually developing tool, useful for describing and explaining phenomena.

General education in mathematics is one way to improve a student’s ability to think in terms of precise and quantitative relationships. It should develop abilities to perceive how things are logically related. It should also enable students to consider systematically alternative approaches to solving problems, and enable them to appreciate the accomplishment and elegance of solutions to problems.

General education courses should help students learn how to use mathematics as a basic tool for working in many different disciplines and for integrating the findings of different disciplines. Because it is important for students to understand that the concepts and methods of mathematics are not fixed, but are continually being expanded, revised, and refined, students can benefit from learning the history of mathematics, and learn how mathematicians evaluate their achievements and decide on their goals.

The Natural and Physical Sciences

To make a significant contribution to general education, courses from the natural and physical sciences ought to attract those who find science fascinating, those who approach it apprehensively, and those whose outlook falls somewhere between. Given the wide range of attitudes toward science, science courses designated as part of a general education program must necessarily differ from each other structurally and pedagogically. All should share, however, certain common characteristics.

Science courses intended for general education should offer students opportunities to acquire an appreciation of science and its contributions to society. General education courses in science should present current information on certain aspects of the natural world, and should require students to follow the logical, and sometimes mathematical, reasoning relating one structure or process to another. What differentiates science from other disciplines is its methods and its choice of problems. Scientists continually build and revise theoretical models to organize and explain natural phenomena. The theories must be logically consistent and must stand the test of experiments. Thus, as part of their general education, students should learn that science does not consist of a set of immutable or unquestionable facts but is by nature a continuing process of hypothesis and revision.

Technology

Throughout history humans have sought to apply their scientific knowledge in ways that enhance material culture, enlarge their capacity to produce goods and services, and defend physically their territorial and ideological borders. This application of scientific knowledge is what is commonly referred to as technology. Technology is visible everywhere and has brought enormous material benefits as well as increasingly complex social and environmental problems. The need to understand the tensions and conflicts that arise over the uses and consequences of technology is as critical as the necessity of making human choices about technology.

C. Humanities and Fine Arts

The humanities and fine arts are expected to give principal attention to the individual and collective search for meaning through order, values and aesthetics. By giving focus to “a search for meaning,” the general education program encourages courses and related experiences which challenge how individual students think about and relate to the culture in which they live, as well as introduce them to some of the literature, the ideas, the art forms, and the expressions of social order which are rooted deep in history.

The search for meaning which is embodied in the humanities and fine arts is an exploration of the many imaginative answers given to the questions about the place of human beings in the universe by richly diverse cultures. In this sense, the humanities and fine arts are attempts to understand human action and thought, to find languages which express ideas and beliefs, hopes and fears, certainties and uncertainties. They provide opportunities for students to see how their present lives connect with the larger life of our culture as it has developed over time. The humanistic tradition embodies the age-long attempt to know and express self through works of the imagination and intellect.

While courses in the humanities and fine arts may help students examine their own values and ways of viewing the world, they also provide opportunities for students to encounter the great humanistic works. By enriching their experience with the exploration or other ways of seeing, of recognizing meanings, and of dealing with the world, students should discover in the interplay the complexity of our world.

As much as possible, humanities and fine arts courses should assist students to appreciate the roles of historians, writers, painters, philosophe rs, sculptors and musicians in giving voice to human understanding and aspiration. These courses may also help students to comprehend the joys that come from personal expression. Thus it is appropriate to provide within related general education courses both opportunities to participate actively in the humanities and arts as creators — as writers, painters, musicians or actors — and as audience in art exhibitions, performances, lectures and discussions.

Conclusion

General education as it is presented in this statement has few unique qualities. Thinkers and writers in various ages and cultures have voiced ideals for individuals and societies that undergird the concepts of general education presented. The pursuit of each of these ideals requires different, often specialized skills. The full realization of any one of these ideals may require a lifetime of experience to perfect, during which one progressively hones skills, encounters a range of practical experiences, and learns to deal with a level of complexity not previously recognized.

Each culture has an image of the person who has had the benefit of a general education. The goals set forth in the preceding sections mirror the idealized vision of our university and of our contemporary society. The following set of courses is intended to make the achievement of these goals more attainable. Faculty and students must create from their commitment to general education a sense of the unity of learning.

THE NORTH DAKOTA UNIVERSITY SYSTEM TRANSFER AGREEMENT

The North Dakota University System (NDUS) General Education Requirement (GERTA) Transfer Agreement was developed to assist students who transfer within the NDUS. If you have completed your general education coursework at a NDUS institution with at least 36 credits of general education courses and transfer to another NDUS institution, normally your general education requirement will have been met. If you have not completed your generals before transferring, most courses will be acceptable as generals at another NDUS school; however, the courses may be redistributed in general areas.

UND coursework generally acceptable at other NDUS schools as general education courses are designated on the list that follows (e.g. ND:ENGL). Please direct questions about the NDUS 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
The following pages describe the requirements which must be met by all students seeking the baccalaureate degree. These include the General Education requirements in (I) Communication, (II) Social Sciences, (III) Arts and Humanities, and (IV) Mathematics, Science, and Technology, as well as regulations concerning majors, minors, grade point average, upper-division course, and residence. A minimum of three (3) credits of the General Education Requirements must meet the World Cultures designation. Students cannot fulfill the world cultures requirement by taking a CLEP or Foreign Language Placement and credit test.

The philosophy guiding the General Education portion of the University’s graduation requirements (I through IV) is explained in the immediately preceding section of the catalog. (Note: engineering students should pay special attention to General Education requirements for engineering students in the School of Engineering and Mines section. The General Education requirements may be satisfied by:

1. Successful completion of coursework acceptable for that area, as specified below, or
2. Achievement of the minimum score required for credit in College-Level Examination Program (CLEP) subject examinations.

### I. Communication (9 sem. credits min.)

Choose one course from each of the three areas:

1. English
   - Engl 110 College Composition I (ND:ENGL) (3)
   - Engl 120 College Composition II (ND:ENGL) (3)
   - Engl 125 Technical and Business Writing (ND:ENGL) (3)
2. Chemistry
   - Chem 131 Chemical Engineering Lab I (2)
   - Chem 332 Chemical Engineering Lab II (2)
   - Chem 431 Chemical Engineering Lab IV (3)
3. Class
   - Class 101 First Year Latin I (3)
   - Class 151 First Year Greek I (3)

Commit 110 Fundamentals of Public Speaking (ND:SPHC) (3)

Engl 120 College Composition II (ND:ENGL) (3)
Engl 125 Technical and Business Writing (ND:ENGL) (3)
Engl 306 Advanced Composition I (3)
Engl 408 Advanced Composition II (3)
E E 481 Senior Design II (3)

Frem 101 First Year French I (4)
Germ 101 First Year German I (4)
Hist 240 The Historian’s Craft (3)
IS 240 Research and Writing in Indian Studies (3)
Ital 101 First Year Italian (4)
ME 480 Mechanical Engineering Seminar (3)
Mus 201 Cultural and Classical Music of the World (3)
Mus 310 Music History Survey I (3)
Mus 311 Music History Survey II (3)
Mus 312 Music History Survey III (3)
Norw 101 First Year Norwegian I (4)
Nurs 230 Personal and Group Dynamics (2)
Num 233 Nursing and Professionalism (3)
Russ 101 First Year Russian I (4)
Span 101 First Year Spanish I (4)

### II. Social Sciences (9 sem. hours min. (must be taken in a minimum of 2 departments)

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<th>Department</th>
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<th>Course Title</th>
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<td>Anth 100</td>
<td>Introduction to Anthropology (ND:SS)</td>
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<td>Anth 171</td>
<td>Introduction to Cultural Anthropology (ND:SS)</td>
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<td>Anth 172</td>
<td>Introduction to Archaeology and World History (ND:SS)</td>
<td>(3)</td>
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<td>Anth 371</td>
<td>Cultural Dynamics</td>
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<td>Anth 374</td>
<td>Old World Prehistory</td>
<td>(3)</td>
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<td>Anth 375</td>
<td>North American Indians (ND:SS)</td>
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<td>Anth 377</td>
<td>North American Archaeology</td>
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<td>Anth 379</td>
<td>Culture Area Studies (ND:SS)</td>
<td>(3)</td>
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<tr>
<td>Arts and Sciences</td>
<td>A&amp;S 225</td>
<td>Introduction to the Study of Women</td>
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<td>Business Administration</td>
<td>BAdm 101</td>
<td>Introduction to Business</td>
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<tr>
<td>Communication</td>
<td>Comm 102</td>
<td>Communication and the Human Community</td>
<td>(3)</td>
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<td>Comm 103</td>
<td>Information Technology and Social Change</td>
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<td>Comm 300</td>
<td>Communication and Society</td>
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<td>Communication Sciences &amp; Disorders</td>
<td>CSD 232</td>
<td>Survey of Communication Disorders</td>
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<td>Aging and Communication</td>
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### Criminal Justice Studies

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### Economics

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<td>Econ 105</td>
<td>Elements of Economics (ND:SS)</td>
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<td>Econ 201</td>
<td>Principles of Microeconomics (ND:SS)</td>
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<td>Econ 202</td>
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### Geography

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<td>Geog 151</td>
<td>Human Geography (ND:SS)</td>
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<td>Geog 161</td>
<td>World Regional Geography (ND:SS)</td>
<td>(3)</td>
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<td>Geog 262</td>
<td>Geography of North America I (ND:SS)</td>
<td>(3)</td>
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<td>Geog 352</td>
<td>Economic Geography</td>
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<td>Geog 354</td>
<td>Conservation of Resources (ND:SS)</td>
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### History

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<td>Hist 101</td>
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<td>Hist 102</td>
<td>Western Civilization II (ND:Hist)</td>
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<td>Hist 103</td>
<td>United States to 1877 (ND:Hist)</td>
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<td>Hist 104</td>
<td>United States since 1877 (ND:Hist)</td>
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<td>Hist 106</td>
<td>Middle Eastern Civilization from Islam to present time (ND:Hist)</td>
<td>(3)</td>
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<tr>
<td>Hist 205</td>
<td>History of Canada since 1867</td>
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<td>Hist 220</td>
<td>History of North Dakota (ND:Hist)</td>
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<td>Hist 221</td>
<td>The Scandinavian Countries since 1500 (ND Hist)</td>
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<td>Hist 325</td>
<td>The United States: The Early Frontier</td>
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<td>Hist 326</td>
<td>The United States: Western Frontier</td>
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<td>Hist 332</td>
<td>Women in American History</td>
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<td>Women in American History Since 1865</td>
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<td>Hist 335</td>
<td>Nuclear Weapons and the Modern Age</td>
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<td>The United States and Vietnam, 1945-75</td>
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<td>Europe: Age of Absolutism, 1648-1789</td>
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<td>Europe: French Revolution and Napoleonic Era, 1789-1815</td>
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<td>Europe: 1815-1918</td>
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<td>Hist 362</td>
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<td>Hist 405</td>
<td>The United States: Age of Jefferson and Jackson, 1789-1850</td>
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<td>The United States: Civil War and Reconstruction, 1850-1877</td>
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<td>The United States: Rise of Industrial America, 1877-1917</td>
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<td>The United States, 1920-1945</td>
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<td>Great Britain Since 1815</td>
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<td>Hist 431</td>
<td>All History courses approved as GERs may be applied to either the Arts and Humanities or the Social Science requirement. See approved History GERs under Arts and Humanities.</td>
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<td>Honors</td>
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<td>Advanced Colloquium in the Social Sciences</td>
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### Indian Studies

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<td>History of the Sioux</td>
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<td>IS 330</td>
<td>Contemporary Plains Indian Culture (ND:SS)</td>
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<td>IS 331</td>
<td>Traditional Plains Indian Culture (ND:SS)</td>
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<td>IS 345</td>
<td>Contemporary American Indian Issues</td>
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<td>IS 370</td>
<td>North American Indians</td>
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<td>IS 371</td>
<td>Reservation Government and Politics</td>
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### Nursing

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<td>Transcultural Health Care Theories, Research and Practice</td>
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### Nutrition and Dietetics

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### Political Science

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**Notes:**
- Courses must be taken in a minimum of 2 departments.
- *FT 322* Fundamentals of Photography (2)
- All History courses approved as GERs may be applied to either the Arts and Humanities or the Social Science requirement. See approved History GERs under Arts and Humanities.
- Honors courses are noted with an *H*.
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Math 115 Introduction to Mathematical Thought (3)
Math 146 Applied Calculus I (ND-Math) (3)
Math 165 Calculus I (ND-Math) (3)
Math 166 Calculus II (ND-Math) (4)

Nutrition and Dietetics
Nut 240 Fundamentals of Nutrition (3)

Philosophy
Phil 350 Symbolic Logic (3)

Physics
***Phys 110 & 110L Introductory Astronomy (with lab) (ND-LABSC) (4)
***Phys 130 & 131L Natural Science —Physics (4)
Phys 140 Physics for Poets (3)
***Phys 150 & 151L Physics for Aerospace Sciences (5)
***Phys 161 & 161L Introductory College Physics I (ND-LABSC) (4)
***Phys 162 & 162L Introductory College Physics II (ND-LABSC) (4)
***Phys 211 & 211L College Physics I (ND-LABSC) (4)
***Phys 212 & 212L College Physics II (ND-LABSC) (4)
***Phys 251 & 251L University Physics I (ND-LABSC) (4)

Psychology
Psy 241 Introduction to Statistics (4)

Sociology
Soc 240 Sociological Statistics (3)

Space Studies
Spil 200 Introduction to Space Studies (ND-Sci) (3)

***Courses designated to fulfill the laboratory science requirement.

V. 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.

VI. 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.

VII. 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 professional 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.

VIII. 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.

IX. 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.)

X. 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 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.

Confering 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. A list of UND’s CCN courses follows, including their previous number and title. Course descriptions for each course are found under the individual department sections. The CCN notation in the course description indicates UND courses that are recognized as common within the North Dakota University System.

OLD COURSE PREFIX, NUMBER, TITLE

<table>
<thead>
<tr>
<th>COURSE PREFIX</th>
<th>NUMBER</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200</td>
<td>Elements of Accounting I</td>
<td></td>
</tr>
<tr>
<td>ACCT 201</td>
<td>Elements of Accounting II</td>
<td></td>
</tr>
<tr>
<td>ACCT 207</td>
<td>Managerial Accounting</td>
<td></td>
</tr>
<tr>
<td>ACCT 218</td>
<td>Computer Applications in Business</td>
<td></td>
</tr>
<tr>
<td>ACCT 295</td>
<td>Survey of Accounting Principles</td>
<td></td>
</tr>
<tr>
<td>ANTH 101</td>
<td>Independent Study</td>
<td></td>
</tr>
<tr>
<td>ANTH 189</td>
<td>Readings in Anthropology</td>
<td></td>
</tr>
<tr>
<td>A&amp;S 200</td>
<td>Arts and Sciences</td>
<td></td>
</tr>
<tr>
<td>A&amp;S 498</td>
<td>Senior Study; Women Studies</td>
<td></td>
</tr>
<tr>
<td>AVIT 393</td>
<td>Glider Certification</td>
<td></td>
</tr>
<tr>
<td>AVIT 395</td>
<td>Seaplane Certification</td>
<td></td>
</tr>
<tr>
<td>AVIT 396</td>
<td>Conventional Aircraft Operations</td>
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<tr>
<td>AVIT 399</td>
<td>Introduction to Aerobic Flight</td>
<td></td>
</tr>
<tr>
<td>AVIT 400</td>
<td>Method &amp; Materials in Teaching Aviation</td>
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<tr>
<td>AVIT 401</td>
<td>Topics in Aviation</td>
<td></td>
</tr>
<tr>
<td>AVIT 409</td>
<td>Cooperative Education</td>
<td></td>
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<tr>
<td>AVIT 410</td>
<td>Special Aerospace Topics</td>
<td></td>
</tr>
<tr>
<td>AVIT 415</td>
<td>Aviation Internship</td>
<td></td>
</tr>
<tr>
<td>AVIT 491</td>
<td>Airline Transport Pilot Certification Lab</td>
<td></td>
</tr>
<tr>
<td>AVIT 497</td>
<td>Readings in Aviation</td>
<td></td>
</tr>
<tr>
<td>BIOL 101/101L</td>
<td>Principles of Biology</td>
<td></td>
</tr>
<tr>
<td>BIOL 110/110L</td>
<td>Introduction to Biology</td>
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</tr>
<tr>
<td>BIOL 124</td>
<td>Environmental Science</td>
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<tr>
<td>BIOL 357</td>
<td>Genetics</td>
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<tr>
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<td>Genetics</td>
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</table>

NEW COURSE PREFIX, NUMBER, TITLE

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<th>TITLE</th>
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</thead>
<tbody>
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<td>OLDCOURSEPREFIX, NUMBER, TITLE</td>
<td>CCN COURSEPREFIX, NUMBER, TITLE</td>
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<tr>
<td>ACCT 200 Elements of Accounting I</td>
<td>ACCT 200 Elements of Accounting I</td>
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<td>ACCT 295 Accounting for Non-Accountants</td>
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</tr>
<tr>
<td>BIOL 357 Genetics</td>
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<td></td>
</tr>
</tbody>
</table>
COMMON COURSE NUMBERS (continued)

OLD COURSE PREFIX, NUMERICAL TITLE
REL 109 Introduction to Old Testament
REL 116 Women in Religion
REL 120 Religion in America
REL 203 World Religions
REL 228 Early Christian Traditions
REL 238 Christianity in the Modern World
REL 247 Introduction to Judaism
REL 250 East & West Religion
REL 395 Selected Topics
REL 470 Seminar on Religion
REL 480 Independent Study in Religion

CCN COURSE NUMBER, TITLE
PHYS 223/223L Introduction to Astronomy
PHYS 251/251L University Physics I
PHYS 252/252L University Physics II
PHYS 253/253L University Physics III
PHYS 290 Special Topics in Physics
PHYS 490 Special Problems
PSCI 101 American Government I
PSCI 102 American Government II
PSCI 231 Politics of Public Administration
PSY 101 Introduction to Psychology
PSY 251 Developmental Psychology
PSY 270 Abnormal Psychology
SOC 101 Introduction to Sociology
SOC 102 Social Problems
SOC 497 Practicum in Sociology
SOC 498 Readings in Sociology
TA 121 Introduction to Theatre Arts
TA 200 Rehearsal & Performance
TA 225 Stagecraft
TA 227 Acting I
TA 232 Acting II
TA 337 Cooperative Education
TA 490 Senior Project
TA 498 Playwriting
VA 110 Introduction to Understanding Art
VA 130 Drawing I
VA 131 Drawing II
VA 173 Design I. Two Dimensional
VA 174 Design I. Three Dimensional
VA 204 Jewelrymaking I
VA 210 Art History Survey: Paleolithic to Renaissance
VA 211 Art History Survey: Renaissance to
VA 230 Figure Drawing I
VA 231 Figure Drawing II
VA 251 Ceramics I

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 Registrar’s Office 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 examinations 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 exams in most of the Subject Examinations. CLEP Subject Examinations currently accepted by UND for transfer credits are listed below with minimum acceptable standard score. Minimum CLEP scores are under review by the North Dakota University System. 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 exceptions to the policy prior to taking the CLEP Subject Examination for the balance of the credit.

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

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

5. A Subject Examination may not be used to establish credit in a subject in 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>Algebra-Trigonometry</td>
<td>50</td>
<td>Math 107 (5 cr.)</td>
</tr>
<tr>
<td>American Government</td>
<td>50</td>
<td>Pusb 115 (3 cr.)</td>
</tr>
<tr>
<td>Analyzing &amp; Interpreting Literature</td>
<td>50</td>
<td>English 271 &amp; 272 (6 cr.)</td>
</tr>
<tr>
<td>Biology (General)</td>
<td>50</td>
<td>Biol 150, 151B (4 cr.)</td>
</tr>
</tbody>
</table>
| Business Law (Introductory) | 50 | Acc 315 (3 cr.)
| Calculus with Elementary Functions | 50 | Math 165 (4 cr.)
| Chemistry (General) | 50                     | Chem 121, 122 (4 cr.) |
| College Algebra     | 50                     | Math 103 (3 cr.)      |
| Composition, Freshman | 50                  | English 110 (1 cr.)  |
| Educational Psychology (Introduction to) | 50 | Psy 213 (3 cr.)
| History of U.S. I   | 50                     | Hist 103 (3 cr.)      |
| History of U.S. II  | 50                     | Hist 104 (3 cr.)      |
| Human Growth and Development | 50 | Psy 250 (4 cr.)
| Psychology (Introductory) | 50 | Psy 111 (3 cr.)
| Languages (French, German, Spanish) | 50 | Frem, Germ, Span 101 (4 cr.)
| Macroeconomics (Principles of) | 50 | Econ 202 (3 cr.)
| Microeconomics (Principles of) | 50 | Econ 201 (3 cr.)
| Sociology (Introductory) | 50 | Soc 119 (3 cr.)
| Trigonometry        | 50                     | Math 105 (2 cr.)      |
| Western Civilization I | 50                   | Hist 101 (3 cr.)      |
| Western Civilization II | 50                   | Hist 102 (3 cr.)      |

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
COOPERATIVE EDUCATION

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

Students spend from 3-9 months on Cooperative Education assignment. Academic credit is granted by the participating academic department through the student’s enrollment in the department’s course titled, Cooperative Education 397. 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 on page iv. Details concerning the registration procedure are given in the Time Schedule of Classes, which is available to all students prior to and at the time of registration.

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 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 p. iv.) 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 from credit to audit or from S/U grading are permitted to the last day to drop that credit. The specific deadlines for the various types of changes of registration are published in the Time Schedule of Classes 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 mail to the current local address a revised class schedule 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 with the Office of the Registrar.

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 should continue classes to completion. An exception to this rule is that a student may have his or her registration canceled without grades for cause (major mental or physical illness or other significant incapacity) providing both the student’s Academic Dean and the Associate Vice President for Student Services agree to this course of action. Please note: Anytime a student withdraws after the first 10 days of the semester, a “W” indicating the withdrawal will appear on the student’s transcript. All courses in which the student was enrolled on the first day of the term will be considered when assessing satisfactory progress for financial aid purposes.

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

STUDENT LOAD

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

For a member of the freshman class, 16 hours a semester is considered a normal schedule. Outside work or activities may necessitate a reduction of the student’s academic schedule. The class load of any freshman who ranks in the lower half of his or her high school class may be restricted to 12 semester credits. The minimum amount of work in which a student shall be enrolled is left to the discretion of the academic adviser.

For most undergraduate colleges from 15 to 17 hours of class work a week is the normal load. A student wishing to enroll in more than 21 semester hours must obtain approval from his/her adviser and the dean of the college in which the student is enrolled.

THE GRADING SYSTEM

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

<table>
<thead>
<tr>
<th>LETTER GRADE</th>
<th>EXPLANATION</th>
<th>GRADE PTS. PER SEM. HR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Marked Excellence</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Superior</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>2</td>
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<tr>
<td>D</td>
<td>Passing but low</td>
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</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>—</td>
</tr>
<tr>
<td>S</td>
<td>Satisfactory</td>
<td>—</td>
</tr>
<tr>
<td>U</td>
<td>Unsatisfactory</td>
<td>—</td>
</tr>
<tr>
<td>W</td>
<td>Withdrawn</td>
<td>—</td>
</tr>
<tr>
<td>NR</td>
<td>Not Reported</td>
<td>—</td>
</tr>
<tr>
<td>AU</td>
<td>Audit</td>
<td>—</td>
</tr>
<tr>
<td>WV</td>
<td>Course Waived</td>
<td>—</td>
</tr>
</tbody>
</table>

The mark “I”, Incomplete, shall 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 so entered on a semester grade sheet. In addition, the instructor shall indicate on a separate form what grade the incomplete should automatically be converted to, if the student fails to complete the assigned work within the allowed time period. An “I” Incomplete, in a course taken for undergraduate credit must be completed during the first four weeks of the succeeding semester that the student is enrolled in institutional credit. An Administrative Procedures Committee petition for an extension of time of an incomplete may be submitted to the Office of the Registrar by a student with the approval of the instructor of the course and the dean of the college offering the course. An “I” once recorded may be removed or converted as indicated above but cannot be expunged from the record. After seven years, all outstanding “Incomplete” grades will be marked as permanent “Incomplete.” A student may complete the course work to remove a permanent “Incomplete” after seven years with the permission of the chairperson of the department offering the course and the dean of the college offering the course.
If a student misses a final examination for reasons not satisfactory to the instructor, he or she is given an F. A student receiving a failure in a course shall not be allowed to pursue the continuation of that course before removing the failure. Any student receiving a failure in a course which is required in his/her curriculum must repeat the course at the earliest opportunity.

**S-U GRADES**

Grades of S or U rather than the traditional grades of A through F are used by the University under regulations specified. A grade of S grants credit toward graduation but does not affect a student’s grade point average except as outlined below in item number 5. A grade of U also does not affect the grade point average and does not grant credit toward graduation.

**Elective S-U Enrollment.** A student of sophomore, junior or senior standing (as determined by the Registrar) may elect to enroll in one or more courses per semester for S-U grading subject to the following regulations:

1. A maximum of 30 semester hours of credit of elected S-U grades may be counted toward his or her baccalaureate degree.
2. Courses in the major field may be not taken for an S-U grade. In the event a student wishes to major in a field in which he/she has taken a required course for an S-U grade, the department, with the approval of the Academic Dean, may (a) accept the S-U grade, (b) select an additional course to substitute or (c) request the Registrar’s Office to change the S or U to the letter grade submitted by the instructor.
3. A student may take extra-departmental major requirements for an S-U grade with the approval of the major department chair and his/her Academic Dean.
4. A course elected for S-U grade will not be included in the 30 hour residency requirement (i.e., all students must complete a minimum of 30 graded credits at the University of North Dakota to receive a bachelor’s degree).
5. Repeating a course by S-U registration will eliminate the effects of the earlier grade from a student’s grade point average if the achieved result is an S. Repetition, which results in a U, will leave the effects of the earlier grade intact.

Class rolls and grade sheets will not identify students who are enrolled for S-U grading. Grades of A, B, and C will be converted by the Office of the Registrar to a grade of S. Grades of D and F will be converted to U. Changes in registration to or from S-U grading for fall and spring semesters may be made during the first five weeks of the semester. The deadline for that same activity during the summer session is determined by using a time guideline which is proportionate to that for the academic year (see Academic Calendar). 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. These courses may be taken in excess of the 30 hour limitation if they are required for that student’s program. Students who do enroll in a required S-U class, which is not a program requirement for them, must include it in the 30 hour maximum and comply with all other elective S-U regulations.

**REPETITION OF COURSES**

A student who receives a grade of D or F in a course may repeat the course without special permission. Courses in which grades of C or better are earned may be repeated upon written approval of the department concerned and the dean of the college offering the course and the student’s academic adviser. Without this approval, both grades will be marked as duplication and not being counted in the student’s GPA. 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.

**RAISING A "D" GRADE**

To raise a D grade, a student may have the alternative of retaking a final examination at the time of the first regularly scheduled final examination in the subject if it meets with the approval of the department and dean of the course and the student’s 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 requirements.

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 course of D is considered unsatisfactory although it is a passing grade. The Registrar mails 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 advisement purposes. Deficiency grades do not appear on the student’s permanent record. It is also the student’s responsibility to keep informed of his/her own performance in a class.

**SEMESTER GRADE REPORTS**

Grade reports are mailed to students at their home address approximately two weeks after the close of each semester and the summer session.

**TRANSCRIPTS OF ACADEMIC RECORDS**

Transcript requests must be submitted in writing. Either a completed “transcript request” form or a letter bearing the student’s signature is acceptable. Telephone requests cannot by federal law be honored nor can requests by relatives or friends of a student. 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. The written request by the student should be sent to the Registrar’s Office, Box 8382, Grand Forks, ND 58202. Questions about the Family Educational Rights and Privacy Act (FERPA) should be directed to the Office of the Registrar.

Each transcript includes the student’s entire academic record to date and current academic status. Partial transcripts are calculated. 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 fax transcripts.

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 earn 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. 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.

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 AND PROCEDURE

Attendance and participation in class activities are considered integral parts of a university education. It is the University policy that attendance in classes is expected of all students. While attendance is necessary to demonstrate competency via participation in some classes, attendance itself is not a measure of competence and therefore is not used as a criterion for evaluation. Students’ grades are based on recognized academic standards (e.g., scholarly achievement and examination performance). Faculty are encouraged to find appropriate ways to reflect in their grading the quality of participation and contributions of students to their classes. Students are informed during the first class week of the criteria to be used in assigning grades to their courses.

In instances where a student is hospitalized or absent due to a death in the family, students are to notify the instructor if unable to attend classes.

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 incompletes will apply.

No undergraduate student should be obligated 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 — DISMISSAL POLICY

Any student who does not maintain minimum academic requirements will, at the end of the term in which he or she fails to meet minimum standards, be placed on Academic Probation. Subsequent failure to meet these standards will result in dismissal from the University.

A student who has earned less than 90 total hours will be considered in Good Academic Standing if he or she maintains a UND Grade Point Average (GPA) of C (2.00) or higher. A student who has earned 90 or more total hours will be in Good Academic Standing only with a 2.00 or higher GPA on both UND and cumulative hours. NOTE: It is possible to be in Good Academic Standing at the University, and, yet to not be in Good Academic Standing in certain University programs which require a GPA higher than 2.00.

Total hours earned toward graduation include (1) all UND hours for which a grade of A, B, C, D, or S, is recorded, (2) all hours accepted in transfer, (3) hours recorded by special examinations, (4) hours with passing grades of non-traditional nature, and (5) other hours which grant credit toward a degree.

Grade Point Average will be calculated by dividing grade points earned by average hours. Average hours include hours for which letter grades of A, B, C, D, and F are recorded. Grade points are accumulated per credit hour at the rate of A—4, B—3, C—2, D—1 and F—0. A student on Academic Probation may remove Probation by attaining Good Standing. A student on Academic Probation who does not remove his or her probation at the end of the next term (semester or summer session) in which he or she enrolls will be dismissed. Academic probation and dismissal will be noted 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, available from the Vice President for Student and Outreach Services, and the Dean of Students Office, 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 periodically. 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. Bribing 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 an overall cumulative grade point average of 3.80 or higher. The student must also have earned a minimum of 30 semester hours and have completed a minimum of 12 hours at the close of the semester, eight of which must be for traditional letter grades.

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 the bachelor’s degree who achieve a scholastic average of 3.20 will be graduated cum laude; those with an average of 3.50, magna cum laude; those with an average of 3.70, summa cum laude. A student with transferred credits will be similarly distinguished if his/her cumulative record and record at the University of North Dakota each meet the requirements. A gold seal indicating the honor will be affixed to the diploma upon graduation. The honor will be recorded on the student’s academic record.

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 the knowledge for and about aerospace, atmospheric sciences, 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 in the nationally accredited programs 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 four academic departments and five major research and support organizations. The department of aviation offers undergraduate degrees in aerospace fields including flight, air traffic control, aviation business and management, aviation education, and a master’s degree in aviation. With its roots in research, the department of Atmospheric Sciences undergraduate program offers students unique opportunities to participate in funded research using the department’s Digital Doppler radar, a customized Cessna Citation II research jet, and in operational forecasting enterprises. 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 and Master’s degrees.

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 their research, academic, and administrative functions, operating a variety of mainframe and mini-computers, and a Cray supercomputer. Working in consort, the Center’s Atmospheric Sciences Department, Space Studies Department, and Scientific Computing Center engage in multidisciplinary research as the Earth System Science Institute. It’s purpose is to better understand and the earth’s complex environment and generate practical tools for agriculture generated from this research. 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 100 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 Atmospheric — a computerized planetarium and multimedia instructional theater.

The School’s computer facilities have developed into one of the most advanced technical and scientific computer systems in the nation. It has achieved a national reputation for the processing and analysis of digital radar data and cloud physics data collected during research flights. Fully integrated systems, with advanced networking, provide a wide range of computer support activities for academic, research, government, and industry programs. The facilities are linked by fiber optics to 20,000 square feet of space dedicated to computer studies.

The School operates a modern flight training facility with a fleet of approximately 100 aircraft including reciprocating and turbine powered airplanes and helicopters. 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.
DEGREES AND REQUIREMENTS

For Graduation

The Degree of Bachelor of Science in Aeronautics or Bachelor of Science in Atmospheric Sciences is conferred by the School of Aerospace Sciences upon a student who successfully fulfills the following requirements. A student must:

1. Complete the University’s General Education Requirements.
2. Earn a minimum Grade Point Average of 2.50 in all courses taken. (Note: transfer students must not only earn a minimum cumulative GPA of 2.50, but must also earn a minimum GPA of 2.50 for studies completed at the University of North Dakota.)
3. Complete the curriculum for the major as outlined in the departmental listings, and
4. Make formal application to the Registrar for the degree sought within four weeks of the beginning of the semester the student expects to graduate.

The Department of Atmospheric Sciences offers both a major and a minor. The curriculum for each can be found under the appropriate departmental listings.

The Department of Aviation, working with the College of Business and Public Administration, also offers the degree of Bachelor of Business Administration with majors in Aviation Management or Airport Management. The curriculum for each of these programs is outlined under the specific departmental listings.

The Department of Computer Science, in conjunction with the College of Arts and Sciences, awards the degree of Bachelor of Science with major in Computer Science as well as the degree of Bachelor of Arts with major in computer science. The curriculum for each of these programs is outlined under Computer Science. A minor in Computer Science may also be completed.

The Department of Space Studies 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.

OTHER PROGRAMS

Cooperative Education. The School encourages its students to gain practical on-the-job experience in their chosen field prior to graduation. 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.

Weather Modification Pilot Training. This one-of-a-kind cooperative education is supported by the U.S. Bureau of Reclamation. 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 8th, 9th, and 10th graders.

In 1998 the Aviation Department instituted a laptop computer program for all aviation majors. The laptop computer will enable 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. 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, the club’s activities include airport tours and attending the national AAAE convention. Originally founded in 1928 to represent management, AAAE established a student chapter program for universities in order to promote professional development and instill professional attitudes in students who are studying aviation-related development, administration, and operations.

American Meteorological Society. The Lake Agassiz Student Chapter of the American Meteorological Society seeks to promote advancement and understanding of meteorology.

Association for Computing Machinery. As the student branch of the National Association for Computing Machinery, this organization sponsors such events as computer programming contests, computer demonstrations, and tutorial programs.

Aviation Safety Association. Organized in 1998, this aviation student group is interested in supporting and educating students in all of the areas related to aviation safety.

Dakota Space Society. 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. The website for DSS is: http://www.space.edu/projects/dss.

Flying Team. The UND Flying Team has won the National Championship title of the National Intercollegiate Flying Association eleven times. Students compete in regional and national events oriented to increasing piloting skill, knowledge, and safety.

Military Aviation Association. This student aviation organization is for those students who desire to make military aviation a career, or who have an interest in military aviation.

Organization of Minority Aviation Professionals. This organization encourages minority students in their efforts to pursue careers within the aerospace industry. It supports the school’s efforts to recruit and retain minority students and faculty.

Student Air Traffic Control Association. 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.

Student Aviation Adviser Council. This six-member student adviser council is elected by their peers to act as a liaison between students and aviation faculty and administration.

Student Aviation Management Association. Founded in 1975, this organization became the first student chapter of the American Association of Airport Executives. It sponsors professional development activities and hosts an annual aviation seminar.

Women in Aviation. A student organization for women pilots, the group provides opportunities for women students to learn more about their chosen profession and participate in a variety of aviation-related activities.

Wilderness Pilots Association. Floatplane enthusiasts have a group to promote air safety as it relates to flying into remote areas. Activities include fly-ins, field trips, a wilderness survival program, and first aid courses.
The College of ARTS AND SCIENCES

Martha 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 1957. 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 Wittner (1948-1965), and interim associate dean Philip A. Rognlie (1965-66). Bernard O'Kelly was dean from 1966 until his retirement in 1995 when he was succeeded by John Ettling (1995-1998). Albert Fiviziani has served as interim dean of the College since 1998.

The College structurally includes at present 18 academic departments: Anthropology, Art, Biology, Chemistry, Communication, Communication Sciences and Disorders, 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 or Bachelor of Science degree with concentration in some substantive or applicable field of study within the traditionally broad spectrum of the liberal arts. The College also enrolls some "unclassified" students who already have a bachelor's degree but wish to pursue further studies without formally registering in the Graduate School, and accepts auditors and special students.

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 and Bachelor of Science 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, 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;
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 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 & Sciences may be admitted directly to the College. Students enrolled in other colleges at UND who decide on an A&S major may transfer to A&S 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 and Computer Science 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. 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.

III. 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 beginning on page 61. Students should note particularly the requirements not only of the majors and concentrations, but, where appropriate, the accompanying requisites in other departments. In the Major (or concentration) students must have a grade point average of at least 2.20 by graduation.

Majors Available in the College

Anthropology
Art
Biology
Chemistry
Classical Studies
Communication
Communication Sciences and Disorders
Computer Science
Criminal Justice
Economics
English
Fisheries and Wildlife Biology
Forensic Science
French
General Studies
Geography
Geology
German
History
Indian Studies
International Studies
Mathematics
Music
Norwegian
Philosophy
Physics
Political Science
Psychology
Religion
Sociology
Spanish
Theatre Arts

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 the 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.

Teacher Certification 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 certification 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 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. Majors in the humanities and social sciences are appropriate. See also the Law School.

Medical School Preparation. Like law schools, medical schools generally require a B.A. or B.S. 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 even 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 Biology may also be 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 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., 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 web site at www.und.nodak.edu (“Academics” to “Majors” to “Pre-Health”).

Pre-Dental

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

Pre-Medical

Most medical schools prefer or 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 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>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Math 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>English 110, 120</td>
<td>College Composition I &amp; II</td>
<td>6</td>
</tr>
<tr>
<td>Phys 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>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 314, 342</td>
<td>Organic Chemistry I &amp; II</td>
<td>10</td>
</tr>
<tr>
<td>Psych 111</td>
<td>Introduction to Psychology</td>
<td>3</td>
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</table>

Freshman Year

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biol 150, 151</td>
<td>Introduction to Biology I &amp; II</td>
<td>8</td>
</tr>
<tr>
<td>Math 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Other Requirements*
### 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 successful completion of courses in the basic sciences, advanced biological sciences, social/behavioral sciences, 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.

### Pre-Optometry

The requirements for admission into a school of optometry are highly variable, but students must normally complete at least three years of college. All optometry schools require at least one year of biology, physics, and chemistry; almost all require at least one course in organic chemistry; and most require calculus. Additional specific courses are required by each school. Consult with the Dean of the College of Arts and Sciences for schools and requirements and the web site above.

### 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>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 150, 151</td>
<td>Introduction to Biology I &amp; II</td>
<td>(8)</td>
</tr>
<tr>
<td>Math 103</td>
<td>College Algebra</td>
<td>(3)</td>
</tr>
<tr>
<td>Physics 211, 212</td>
<td>College Physics I &amp; II</td>
<td>(8)</td>
</tr>
<tr>
<td>Bio 315</td>
<td>Genetics</td>
<td>(3)</td>
</tr>
<tr>
<td>Other Requirements*</td>
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### Sophomore Year

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<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Chem 341, 342</td>
<td>Organic Chemistry</td>
<td>(10)</td>
</tr>
<tr>
<td>Biology 315</td>
<td>Genetics</td>
<td>(3)</td>
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<tr>
<td>Other Requirements*</td>
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### Junior Year

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Physics 211, 212</td>
<td>College Physics I &amp; II</td>
<td>(8)</td>
</tr>
<tr>
<td>MBio 302</td>
<td>General Microbiology Lecture and Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>Other Requirements and Electives**</td>
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</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Biochemistry 301</td>
<td>Biochemistry Lecture</td>
<td>(3)</td>
</tr>
<tr>
<td>Physics 211, 212</td>
<td>College Physics I &amp; II</td>
<td>(8)</td>
</tr>
<tr>
<td>ISBE 320</td>
<td>Professional Communication for Business</td>
<td>(3)</td>
</tr>
<tr>
<td>Acct 200</td>
<td>Elements of Accounting I</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 110 and 120 (or 125)</td>
<td>Humanities, Social Science, or Electives</td>
<td>(6-8)</td>
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</table>

### Pre-Optometry

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Engl 110, 120</td>
<td>College Composition I &amp; II</td>
<td>(6)</td>
</tr>
<tr>
<td>Bio 150, 151</td>
<td>Introduction to Biology I &amp; II</td>
<td>(8)</td>
</tr>
<tr>
<td>Math 107</td>
<td>Precalculus</td>
<td>(5)</td>
</tr>
<tr>
<td>Psych 111</td>
<td>Introduction to Psychology</td>
<td>(3)</td>
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### Sophomore Year

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Chem 121, 122</td>
<td>General Chemistry I &amp; II</td>
<td>(8)</td>
</tr>
<tr>
<td>Math 103</td>
<td>College Algebra</td>
<td>(3)</td>
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<tr>
<td>Other Requirements*</td>
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### Junior Year

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Physics 211, 212</td>
<td>College Physics I &amp; II</td>
<td>(8)</td>
</tr>
<tr>
<td>Biochemistry 301</td>
<td>Biochemistry Lecture</td>
<td>(3)</td>
</tr>
<tr>
<td>Other Requirements and Electives**</td>
<td></td>
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</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry 301</td>
<td>Biochemistry Lecture</td>
<td>(3)</td>
</tr>
</tbody>
</table>

** Other requirements include: Math 146 or 165, Psych 241, Engl 110 and 120 (or 125), Psych 111 or Soc 110.**

*** Currently required only by UM Twin Cities Medical School.***

### 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 work at one intellectual initiative and intellectual self-discipline; and usually the rewards are correspondingly greater.

Without entering either of the Honors Programs, both of which provide a greater challenge and opportunity for independent study and research, students can receive academic credit. Most departments have "readings" or "special topics" courses in which the student can work with a faculty member in a subject area not covered by regular courses. 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 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

Dennis Elbert, Dean

HISTORY
A course in Commerce was organized in 1917-1918 as a four-year curriculum within the College of Liberal Arts, with students granted the degree of B.A. (Course in Commerce). A School of Commerce was organized in 1924 as an independent two-year school on a distinctly professional basis. The name was changed in 1955 to the College of Business and Public Administration. The College’s undergraduate business programs have been accredited by the AACSB International — the Association to Advance Collegiate Schools of Business — since 1984, and the MBA program has had AACSB accreditation since 1990.

MISSION
The University of North Dakota College of Business and Public Administration is committed to being the preeminent center of learning for business and public administration in the upper great plains. We are dedicated to preparing men and women with the academic tools, people skills, and ethical values for a lifetime of productive leadership in business, government and society. We are further dedicated to the advancement of knowledge and its dissemination to private and public institutions. In all our endeavors, we seek to develop an atmosphere of learning and scholarship which serves students, faculty, the business community, government organizations, and society.

WESERVE STUDENTS
Our curriculum provides a solid foundation for the development of the knowledge and values requisite to successful careers in business, industry, and public service. Learning experiences consisting of classroom, tutorial, and outside activities provide a rigorous, challenging, and highly interactive environment intended to develop leaders as well as dedicated employees in business, industry, and government. By emphasizing student-professor contact through small class sizes, and in all other modes of instruction, we seek to cultivate the capacity for creative thinking, the willingness to accept challenge, and the courage to act with ethical standards and social responsibility.

WESERVE FACULTY
By nurturing an intellectually stimulating teaching and research environment, combined with appropriate resources, the College seeks innovative, interactive, and interdisciplinary approaches toward learning and timely contributions to knowledge consistent with the needs of business, government, and society.

WESERVE BUSINESS, INDUSTRY AND GOVERNMENT
We emphasize comprehensive learning that combines the study of liberal arts, business, economics, and the public sector. A core value is the development of an understanding and appreciation for the role of business enterprise and government at local, regional, national, and international levels. With an understanding of the role of technology and the impact of technological change, coupled with practical business world experience, our graduates are capable of making immediate as well as long-term contributions to their organizations. Our faculty provide timely and appropriate consulting expertise serving a variety of needs. The development of interactive interdisciplinary educational and scholarly relationships among faculty, the business community, and government entities are highly valued and continuously pursued.

WESERVE SOCIETY
Our graduates understand and appreciate the political, cultural, and economic system in which we all work and live. When combined with a strong work ethic, and attitude of teamwork and cooperation, a personal dedication to excellence, and an appreciation for a community of diverse individuals, long-term and lasting contributions to society are anticipated outcomes. We seek to transfer classroom knowledge to life and to instill the value of lifelong learning.

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: Accounting, Airport Management, Aviation Management, Banking and Financial Economics, Business Economics, Entrepreneurship, Financial Management, Information Systems, Management, 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 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 a minor in International Business (see Business Administration). 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 and the College of Education and Human Development. They include Business Education, Economics, Political Science, and Vocational Marketing Education.

The College offers a course which provides an overview of the many areas of focus in business; the Introduction to Business course (BAdm 101) provides a study of business and its environment, organization, operation, and the interrelationships with government and society. Students will become familiar with the American enterprise system and issues facing society today. The Introduction to Business course is open to anyone enrolled at the University and will fulfill a portion of the Social Science 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-Business 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. Completed the six Pre-Business Core courses (Acct 200 & 201; ISys 217; 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 listings)

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 Code</th>
<th>Course Title</th>
<th>Credit 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>Technical &amp; Business Writing</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 104</td>
<td>Finite Math</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 146</td>
<td>Applied Calculus I</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 115</td>
<td>American Government I</td>
<td>(3)</td>
</tr>
<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking</td>
<td>(3)</td>
</tr>
<tr>
<td>Psy 111</td>
<td>Introduction to Psychology (see notes)</td>
<td>(3)</td>
</tr>
<tr>
<td>or</td>
<td>Introduction to Sociology</td>
<td>(3)</td>
</tr>
<tr>
<td>or</td>
<td>Introduction to Cultural Anthropology</td>
<td>(3)</td>
</tr>
<tr>
<td>or</td>
<td>Arts &amp; Humanities Electives (see notes)</td>
<td>(6)</td>
</tr>
<tr>
<td>or</td>
<td>Free Elective</td>
<td>(3)</td>
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</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit 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>Acc 203</td>
<td>Elements of Accounting I</td>
<td>(3)</td>
</tr>
<tr>
<td>Acc 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 217</td>
<td>Fundamentals of Management</td>
<td>(4)</td>
</tr>
<tr>
<td>Arts &amp; Humanities Electives</td>
<td>(see notes)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

**Notes**

Students desiring to major in Airport Management or Aviation Management must: take ATS 110 for laboratory science requirement, take two semesters of a foreign language or enrich arts and humanities requirement.

Students desiring to major in Information Systems must take Psychology 111 instead of Sociology 110 or Anthropology 171.

Students desiring 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. Full lower division transfer credit will be granted for all courses equivalent to those specified for the freshman and sophomore years at the University of North Dakota.

Business administration courses taken at the freshman or sophomore level at another institution which are similar to junior or senior courses offered at the University of North Dakota will be accepted for transfer credit only if the student passes a validation examination covering each course for which transfer credit is sought. Students who take junior/senior upper division courses at unaccredited four-year schools may be required to take a validation examination. Transfer credit is not allowed for Mgmt 475, Strategic Management, the capstone course for business degree programs at UND. Validation examinations are administered by the department responsible for the course(s) in question. Students desiring to validate courses taken at another institution should contact the College’s Office of Academic Advisement, room 127, Gambles Hall.

**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.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. degree** must earn a minimum 2.50 overall and UND GPA.

**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 the major program of study.

**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 program, 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, Aviation, Economics, 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.), master of Science with majors in Industrial Technology and Career and Technical Education. The master of Business Administration program is accredited by the AACSB, the International Association for Management Education.

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 three networked microcomputer laboratories that provide students access to the internet and popular spreadsheet, database, and word processing software; video display equipment for in-class computer-aided instruction; and video tape players with large screen monitors. 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 devises, and laptop 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. Cargill has committed to a $150,000 donation to renovate the third floor of Gamble Hall. Pit style classroom rooms in Gamble Hall are designed in amphitheater format to facilitate case study instruction. Study carrels are also available within the building so that students may make profitable use of their time between classes. Two classrooms have been refitted as interactive video studios and are now 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 Faculty of Political Science and Public Administration. It conducts research into various problems of state and local government in North Dakota either at the request of government agencies or on its own initiative. The Bureau also conducts workshops, seminars, and other conferences for the purpose of disseminating information to state and local government officials, and undertakes activities such as polling and public and non-profit management consulting. It maintains a research library for faculty and student use in conducting research on governmental problems.

THE CENTER FOR INNOVATION
The Center for Innovation (Rural Technology 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 (Gamble Hall, Room 118) 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 through five regional centers, an outreach center and a procurement technical assistance center located throughout the state. In partnership with the University System, the U.S. Small Business Administration and the State of North Dakota, 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/letter writing 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 & Public Administration. Some of the council’s activities include hosting the annual BPA conference and presenting the William Frederick Lawrence Outstanding Achievement Award. 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, Financial Management Association, Information Management Club, Management Club, MBA Student Association, Native American Business Leaders, Public Affairs Club, Society of Manufacturing Engineers, Students in Free Enterprise.

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, Sigma Iota Epsilon.
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 education- al 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 pro- vided 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 sit- uation and need. The Division administers the following: credit corre- spondence study, extension courses, conferences, seminars, workshops, certificate programs, University within the University, Work Force Development, evening and weekend courses and off-campus Graduate degree programs at the UND Graduate Center at Bismarck and to a national and international audience.

Extension Program

Extension courses are workshops offered to professionals for gradu- ate credit. Most of the workshops deal with topics related to education, personal growth and working with youth. The credits earned through these workshops count towards certification renewal and local school district salary-lane changes. The appropriate academic department and colleges approve all workshop courses and instructors. Since these courses are not designed for the purpose of being part of a graduate degree program, their credit normally may not be applied toward a graduate degree.

Additional information can be obtained by calling: (701) 777-4225 or toll-free 1-877-450-1842, by writing: Extension Program, Division of Continuing Education, University of North Dakota, Box 9021, Grand Forks, ND 58202-9021 or by visiting our web-site: www.conted.und.edu/ext/.

Evening and Weekend Courses and Programs

The Division of Continuing Education in coordination with the University of North Dakota’s academic colleges and departments offer courses and degree programs in the evening in Grand Forks as well as other communities throughout the State of North Dakota through the Interactive Video Network. Programs include the Masters of Public Administration and Masters of Business Administration from the College of Business and Public Administration; the Masters of Education in Special Education, Masters of Education in Educational Leadership, Masters of Science in General Studies in Education, Masters of Science in Elementary Education and Ph.D. of Teaching and Learning: Higher Education, Masters of Social Work, and courses in Autistic Spectrum Disorders from the College of Education and Human Development.

Additional Degree Programs offered through videotape and the internet include Masters of Space Studies from the John D. Odegard School of Aerospace Sciences and a Bachelor of Science in Chemical, Civil, Electrical and 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: Extended Degree Programs, Division of Continuing Education, University of North Dakota, Box 9021, Grand Forks, ND 58202-9021 or by visiting our web-site: www.conted.und.edu/extended/.

Correspondence Study

Correspondence Study offers more than 80 courses from 25 UND departments. Correspondence Study is flexible, allowing students to enroll at anytime, work at their own pace and study in a place of their choosing. Students have nine months to complete a course from their enrollment date. Correspondence Study allows the student to learn and grow while managing family and/or work responsibilities.

Additional information can be obtained by calling: (701) 777-3044 or toll-free 1-800-342-8230, by writing: Department of Correspondence Study, Division of Continuing Education, University of North Dakota, Box 9021, Grand Forks, ND 58202-9021 or by visiting our web-site: www.conted.und.edu/creditcorre/.

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

Chemical Engineering

201 Stoichiometry, 3 credits

Communication

200 Introduction to Media Writing, 3 credits
244 Reporting and Feature Writing, 3 credits
313 Persuasion, 3 credits
322 Editing, 3 credits
328 Community Journalism, 3 credits

Economics

201 Principles of Microeconomics, 3 credits
202 Principles of Macroeconomics, 3 credits

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
303 Survey of American Literature, 3 credits
304 Survey of American Literature, 3 credits
305 Creative Writing, 2 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
University of North Dakota

**General Information for Bismarck/Mandan Area**

The University of North Dakota offers graduate degree programs through the UND Graduate Center/Bismarck. 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 Graduate Center/Bismarck 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 Graduate Center/Bismarck include Masters degrees in Business Administration, Public Administration, Special Education, Educational Leadership, General Studies in Education, Elementary Education, Social Work, and a Ph.D. in Teaching and Learning; Higher Education.

The higher education courses are delivered to Bismarck via the North Dakota Interactive Video Network (ND-IVN). The ND-IVN system links 14 communities across the state and provides students an opportunity to take course work without leaving their vicinity. The Interactive Video Network 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. The Graduate Center has served the Bismarck-Mandan areas since 1976. Hundreds of students have taken courses and received degrees through off campus programs.

Additional information can be obtained by calling: (701) 224-5437 or toll-free 1-800-445-5073, by writing: UND Graduate Center/Bismarck, 1200 College Drive, PO Box 5587, Bismarck, ND 58506-5587 or by calling the UND Division of Continuing Education at (701) 777-4884 or toll-free at 1-800-877-1842.

**Office of Conference Services**

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 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) 777-2663 or toll-free 1-800-342-8230, by writing: Office of Conference Services, Division of Continuing Education, University of North Dakota, Box 9021, Grand Forks, ND 58202-9021 or by visiting our web-site: www.conted.und.edu/conferences/.

**Office of Certificate Programs**

The Office of Certificate Programs provides distance education for non-academic credit or certification programs. Courses are aimed at professional development in a wide variety of areas. Special emphasis on Dietary Managers, Real Estate, and Paralegal certification courses.

Additional information can be obtained by calling: (701) 777-4269 or toll-free 1-877-450-1841, by writing: Office of Certificate Programs, Division of Continuing Education, University of North Dakota, Box 9021, Grand Forks, ND 58202-9021 or by visiting our web-site: www.conted.und.edu/ceu/.

**Certificate Programs**

- **Food Service and Nutrition**
  - Basics of Nutrition, 3.5 Continuing Education Units
  - Diabetes Nutrition Therapy, 2.5 Continuing Education Credits
  - Dietary Managers Course, 32 Continuing Education Credits
  - Food Safety: HACCP, 2.2 Continuing Education Credits
  - Introductory Nutrition for Dietary Personnel, 4.8 Continuing Education Units
  - Menu Planning for Health Care Facilities, 3.0 Continuing Education Units
  - Nutrition and Aging, 3.5 Continuing Education Credits
  - Nutrition Therapy for Dietary Personnel, 4.8 Continuing Education Units

- **MCAT Review Course**

- **Mathematics**
  - Math 100, A Refresher Course in Mathematics, 5.4 Continuing Education Units

- **Paralegal Certificate Course**, 10 Continuing Education Units

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**Geology**

- 101 Introduction to Geology, 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

**Humanities**

- 101 Humanities I, 4 credits
- 102 Humanities II, 4 credits

**Information Systems**

- 309 Information Resource Administration, 3 credits
- 315 Records & Information Management, 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 (Does not count towards graduation at UND), 3 credits
- 103 College Algebra, 3 credits
- 106 Finite Mathematics, 3 credits
- 105 Trigonometry, 2 credits
- 107 Pre-Calculus 107, 5 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

**Music**

- 100 Introduction to the Understanding of Music, 3 credits

**Nutrition and Dietetics**

- 240 Fundamentals of Nutrition, 3 credits

**Occupational Therapy**

- 200 Introduction to Occupational Therapy, 2 credits
- 205 Medical Terminology, 1 credit

**Psychology**

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

**Religion**

- 101 Introduction to Religion (West), 3 credits
- 203 World Religions, 3 credits
- 345 Death and Dying, 3 credits

**Sociology**

- 110 Introduction to Sociology, 3 credits
- 309 Selected Topics: Sociology of Military, 3 credits
- 331 Rural Sociology, 3 credits
- 335 The Family, 3 credits
- 352 Aging, 3 credits
- 355 Sociology of Health and Dying, 3 credits

**Teaching & Learning**

- 200 Exploring Teaching, 2 credits
- 350 Development & Education of the Adolescent, 3 credits

**Visual Arts**

- 110 Introduction to Visual Arts, 3 credits
- 120 Introduction to Drawing and Color Materials, 3 credits
- 391 Special Topics: Visual Thinking, 3 credits

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

**ADMISSION**

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

Upon satisfactory completion of a course, grades are forwarded to the Registrar’s Office. Transcripts may be requested from the Registrar’s Office and may be sent to another institution upon written request.
The College of Education and Human Development

Dan Rice, Dean

The College of Education and Human Development

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.

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.

The College of Education and Human Development, University of North Dakota, Box 7131, Grand Forks, ND 58202-7131 or by visiting our web-site: www.conted.und.edu/U2/.

Work Force Development

The Work Force Development Office is the “gateway” for business and industry to the talents, expertise and technologies that are available through the University of North Dakota. The Office of Work Force development is based on the concept that the University would become the long-term strategic partner of business and industry and the preferred provider of workforce development services and training. Services available to business and industry include facilitation services, strategic planning services, research for business and industry, human resources consulting, the management of training departments, the development of training plans and curriculum, and revenue procurement (grantmanship) on behalf of business and industry to support their individual workforce development initiatives.

Additional information can be obtained by calling: (701) 777-2313 or toll-free 1-800-342-8230, by writing: Work Force Development, Division of Continuing Education, University of North Dakota, Box 7131, Grand Forks, ND 58202-7131 or by visiting our web-site: www.conted.und.edu/workforce/.

The 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) 777-4266 or toll-free 1-800-342-8230, by writing: University Within the University, Division of Continuing Education, University of North Dakota, Box 7131, Grand Forks, ND 58202-7131 or by visiting our web-site: www.conted.und.edu/U2/.
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, where it has developed programs to prepare and support professionals, with focus on practice in rural communities.

**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 through 2002. Programs in social work are accredited by the Council on Social Work Education. In 1998, it grew to include UND’s program in Recreation and Leisure Services. 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 Social Work

**Teaching and Learning**
- B.S.Ed. with major in Business Education
- B.S.Ed. with major in Early Childhood Education
- B.S.Ed. with major in Elementary Education
- B.S.Ed. with major in Elementary/Early Childhood Education
- B.S.Ed. with major in Elementary/Elementary Mathematics Education
- B.S.Ed. with major in Elementary/Middle Level Education
- B.S.Ed. with major in Elementary/Music Education
- B.S.Ed. with major in Elementary/Physical Education
- B.S.Ed. with major in Elementary/Visual Arts Education
- B.S.Ed. with major in Vocational Marketing Education
- B.S.Ed. with major in Middle/Junior High 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 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 Geophysics
- B.S. with major in Mathematics
- B.S. with major in Physics
- B.A. with major in Visual Arts

Students preparing to teach music or physical education in the schools may fulfill requirements to teach grades 1 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

Minors may be taken in a wide variety of fields including athletic coaching, chemical use/abuse awareness, gerontology, health education, middle level 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 Teacher Education**

Regardless of the college in which their degree is being earned or their degree status, students interested in teacher licensure must make formal application to Teacher Education. Students apply for admission after completion of 30 semester hours, normally while enrolled in an entry level course of one of the teacher education programs: T&L 330 Introduction to Teaching and Learning, T&L 310 Introduction to Early Childhood or T&L 200 Exploring Teaching. Students transferring an entry-level course from another institution apply in the first semester of enrollment at the University of North Dakota. Application materials are available in the office of the Dean of the College of Education and Human Development.

New admission standards and policies are being introduced in Teacher Education and will begin to be implemented for Fall semester 2001. These include the use of a standardized test for admission, minimum GPA, and the possibility of documented experiences in teaching situations or personal interviews.

For students who complete their application process during the fall semester 2001 intending to begin their professional education course sequence in spring 2002, a PPST (Pre-Professional Skills Test) score is required to be reported. Minimum scores for admission to the College of Education and Human Development Teacher Education program are established for Reading, Mathematics, and Writing. Information regarding registration for the test, dates and costs are available through the UND Testing Center and the College Office of Advising and Admissions. These scores must be reported at the time of application.

A minimum GPA of 2.50 will be required of all students who complete the application process during the fall 2001, spring 2002 and fall 2002 semesters. Beginning in spring semester 2001, a minimum GPA of 2.75 will be required of all students completing the application process for the fall 2003 semester.

In addition, documentation of previous experiences in teaching environments and/or personal interviews may be required as part of the application process.

Admissions activities are conducted on specific dates during the fall and spring semesters and will be publicized. Notification of admission status is normally made within 20 working days of completing the admission process. Specific policies, procedures and dates are available in the College Office of Advising and Admission.

**DESIGN OF THE CURRICULUM**

**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 wholistic 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 preservice teachers 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 CERTIFICATION 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.

Students 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 2.50, and meet the legal requirements which include a satisfactory criminal background check, are eligible for certification to teach in North Dakota. Students apply to the North Dakota Education Standards and Practices Board for certification using forms that are available in the Office of the Dean of Education and Human Development. Application should be initiated prior to graduation. Students interested in teacher certification in states other than North Dakota should seek information in the College Office of Advising and Admissions.

**OTHER REQUIREMENTS OF TEACHER EDUCATION STUDENTS**

**Continuous assessment.** Student progress in teacher education programs is evaluated through regular review of portfolios assembled by students. Students are asked to save and file all work completed in courses of their teacher education programs. At several points in each program, students review their work with faculty and other students. 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. Application for student teaching is made for the spring semester by the third Friday in September and for the fall semester by the third Friday in January. Late applicants cannot be guaranteed placement in the preferred semester.

Acceptance for student teaching requires that students in all majors which include Elementary Education and in Middle Level Education complete each course in Teacher Education through Applied Methods (TEAM) with a minimum grade of C, satisfactorily complete a field experience, present a minimum overall GPA of 2.50 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 student has completed or is enrolled in all courses of the major and the professional education programs, has an overall GPA of at least 2.50, 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 advisor(s).

Although student teacher placement is usually made in greater Grand Forks and the surrounding area, more distant placements can often be arranged for students whose performance in the program is strong and who are recommended by the faculty. Student teaching placement in the area of social studies may be limited by the availability of cooperating teachers.

**OTHER PROGRAMS OF THE COLLEGE**

**Cooperative education.** The College of Education and Human Development encourages students to gain on-the-job experiences in their chosen fields prior to graduation. Cooperative Education experiences allow students to secure salaried, career-related work experiences under the supervision of both a supervising employer and the appropriate academic department while receiving academic credit. Please note, however, that student teaching, required in all teacher education programs is unpaid, as specified by North Dakota law.

**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, and Special Education 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

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 Geology and Technology, Geological Engineering, and Mechanical Engineering. All programs are supported by well-designed and well-equipped laboratories.

MISSION

The primary mission of SEM is to provide students a broad general education coupled with strong engineering fundamentals that prepare graduates to successfully fill important positions in professional practice in industry and government. Program completers 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 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 through the Corporate Engineering Degree Program (CEDP).

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 in meeting the mission of the School of Engineering and Mines.

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 two years of engineering 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 Geological Engineering, and Bachelor of Science in Mechanical Engineering. The School of Engineering and Mines also offers a Bachelor of Science in Environmental Geology and Technology.

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.

A cooperative program with the University of Manitoba at Winnipeg is available for engineering students interested in receiving a bachelor’s degree in computer engineering. Students study for one year at the University of North Dakota and complete the last three years at the University of Manitoba. Further information is available in the Engineering Dean’s Office.

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, and mechanical engineering; Master of Science with majors in chemical engineering, electrical engineering, geology, and mechanical engineering; and Doctor of Philosophy with majors in energy 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 energy 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 of this catalog.

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.

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.

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>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>
<tr>
<td></td>
<td></td>
<td>An additional science course which may be prescribed by each admitting department.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>At least four engineering science courses or acceptable equivalents prescribed by each admitting department.</td>
</tr>
</tbody>
</table>

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

**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 course work from other institutions that will meet the School of Engineering and Mines’ requirements.

**Degree Program Application Deadlines.** Students will apply for admission to a professional degree program during the term in which they are completing the foundation course work (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 application status will normally be mailed by April 1.

**Selection and Admission Process for 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. Earning at least a C grade in each of the foundation courses
2. The GPA earned in the foundation courses and all other engineering courses completed at the time of application for admission
3. 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 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.

No more than one unsuccessful completion will be allowed for any engineering course.

A minimum 2.00 overall GPA, 2.00 UND GPA, and 2.00 GPA for UND engineering courses in each degree program is required of all students in engineering. If any 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.

Students who have been admitted to a professional degree program, in addition to meeting stated requirements, will be allowed no more than a total of four unsuccessful completions in courses specifically listed in the program of study.

**Dismissal.** Dismissal from the School of Engineering and Mines will result when any of the above policies 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. No student will be reinstated within one calendar year of dismissal from the program, and reinstatement may be on a space-available basis.

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 2.00 overall Grade Point Average and a 2.00 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 2.00 GPA for work taken at the University of North Dakota.

**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 program, 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.

**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 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</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 121, 122..........General Chemistry I, II</td>
<td>(4)</td>
<td>(4)</td>
</tr>
<tr>
<td>English Composition</td>
<td>(3)</td>
<td>(3)</td>
</tr>
<tr>
<td>Eng 110..................College Composition I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eng 101.................Graphical Communications</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Math 165, 166...........Calculus I, II</td>
<td>(4)</td>
<td>(4)</td>
</tr>
<tr>
<td>Phys 251, 251L..........University Physics I</td>
<td>(4)</td>
<td>(4)</td>
</tr>
</tbody>
</table>
### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>First Semester Credits</th>
<th>Second Semester Credits</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 I</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>EE 206</td>
<td>Electrical Engineering Fundamentals</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Engl 125</td>
<td>Technical and Business Writing or 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>(4)</td>
<td></td>
</tr>
<tr>
<td>Phys 252/252L</td>
<td>University Physics II</td>
<td>(3)</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 Engineering programs must complete Philosophy 370, Ethics in Engineering and Sciences, and Economics 201, Microeconomics. In addition, within the GER Arts and Humanities or Social Science areas, there must be at least five (5) semester credits in one department. All Engineering students should plan carefully the fulfillment of their university GER’s so that they are inclusive of these Engineering Program Requirements.

### INTEGRATED MASTER OF ENGINEERING PROGRAM

The Integrated Master of Engineering program provides an opportunity for selected students to work concurrently toward both the baccalaureate and Master of Engineering degrees. Those students will be able to complete both degrees in a total of five years and will be qualified to directly enter the engineering profession at an advanced level with special competence in engineering design.

**Admission Requirements:**

Students may be admitted to the Integrated Master of Engineering program if they:

1. Have completed a minimum of 90 semester credits toward an engineering baccalaureate degree;
2. Have completed a minimum of 36 semester credits of approved engineering courses;
3. Have demonstrated the academic achievement necessary to pursue advanced study in engineering by attaining a GPA of at least 2.50 for all previous work.

Interested students should apply for admission to this program early during the second semester of the junior year on forms available from the UND Graduate School. Those admitted will receive a letter from the Dean of the Graduate School to that effect, and their academic transcripts will be marked accordingly.

### STUDENT ORGANIZATIONS

#### Student Societies

There are student chapters of each of the following professional and technical societies: 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 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, AIME, ASCE, ASME, IEEE and SWE; the vice presidents of Eta Kappa Nu, Sigma Gamma Epsilon, and Tau Beta Pi; and the engineering student senator.

#### CORPORATE ENGINEERING DEGREE PROGRAM

The Corporate Engineering Degree Program (CEDP) offers baccalaureate degrees in chemical, electrical and mechanical engineering via video tape and on-campus laboratories. This program is offered in cooperation with the School of Engineering and Mines and the Division of Continuing Education at the University of North Dakota.

On-campus courses are video taped and the tapes are distributed to each student enrolled in CEDP. Students enrolling in CEDP courses are employees of companies who have joined a consortium. Currently the consortium consists of 33 companies. 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 E-mail. Faculty members are exploring further use of the Internet for student interaction and course delivery.

For further information please contact the Division of Continuing Education at 1-800-342-8230.
The GRADUATE SCHOOL
Joseph N. Benoit, Dean

MISSION
The Graduate School has responsibility for all graduate work at the University. It is the purpose of this 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 (about 1,500 students) and most diversified (49 programs) graduate program in the region. A number of unique facilities and support resources augment the instructional and research program.

Each year approximately 500 new students enroll for degrees in the Graduate School, and approximately 400 students receive master’s degrees and 50 students receive doctoral degrees. In addition, the Graduate School and the Division of Continuing Education offer an extensive program of off-campus graduate work.

DEGREES GRANTED
The degrees conferred for graduate work are the Master of Arts, Master of Science, Master of Education, Master of Business Administration, Master of Engineering, Master of Fine Arts, Master of Music, Master of Physical Therapy, Master of Public Administration, Master of Social Work, Doctor of Arts, Doctor of Education and Doctor of Philosophy. The Specialist Diploma is offered in Educational Leadership.

GRADUATE PROGRAMS
The University offers work leading to the doctorate in 18 fields. Forty-six programs 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. Courses with 500 series numbers are graduate courses and are normally open only to graduate students. 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. For a listing of the fields in which graduate degrees may be obtained, see the table below.

ADDITIONAL INFORMATION
For detailed information students should consult the Graduate School Section of this Catalog or address inquiries to the Dean of the Graduate School, Box 8178, University of North Dakota, Grand Forks, ND 58202; Telephone (701) 777-2784.

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### GRADUATE PROGRAMS AND DEGREES

<table>
<thead>
<tr>
<th>Program</th>
<th>Degrees Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy and Cell Biology</td>
<td>MS, M.S.</td>
</tr>
<tr>
<td>Art</td>
<td>MFA</td>
</tr>
<tr>
<td>Atmospheric Sciences</td>
<td>MS</td>
</tr>
<tr>
<td>Aviation</td>
<td>MS</td>
</tr>
<tr>
<td>Biochemistry and Molecular Biology</td>
<td>MS, Ph.D.</td>
</tr>
<tr>
<td>Biology</td>
<td>MS, Ph.D.</td>
</tr>
<tr>
<td>Business Administration</td>
<td>MBA</td>
</tr>
<tr>
<td>Career and Technical Education</td>
<td>MS</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>MS, M. Engr.</td>
</tr>
<tr>
<td>Chemistry</td>
<td>MS, Ph.D.</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>M. Engr.</td>
</tr>
<tr>
<td>Clinical Laboratory Science</td>
<td>MS</td>
</tr>
<tr>
<td>Communication</td>
<td>MA</td>
</tr>
<tr>
<td>Communication Sciences and Disorders (See Speech-Language Pathology and Speech and Hearing Science)</td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>MS</td>
</tr>
<tr>
<td>Counseling</td>
<td>MA</td>
</tr>
<tr>
<td>Counseling Psychology</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Early Childhood Education</td>
<td>MS</td>
</tr>
<tr>
<td>Education — General Studies</td>
<td>Ed.D., Ph.D.</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>MS, M. Engr.</td>
</tr>
<tr>
<td>Elementary Education</td>
<td>MS, M.Ed.</td>
</tr>
<tr>
<td>Energy Engineering</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>English Language and Literature</td>
<td>MA, Ph.D.</td>
</tr>
<tr>
<td>Geology</td>
<td>MA, MS, M.Ed.</td>
</tr>
<tr>
<td>Geography</td>
<td>MA, MS, Ph.D.</td>
</tr>
<tr>
<td>History</td>
<td>MA, DA</td>
</tr>
<tr>
<td>Industrial Technology</td>
<td>MS</td>
</tr>
<tr>
<td>Instructional Design and Technology</td>
<td>MS, M.Ed.</td>
</tr>
<tr>
<td>Kinesiology</td>
<td>MS</td>
</tr>
<tr>
<td>Linguistics</td>
<td>MA</td>
</tr>
<tr>
<td>Mathematics</td>
<td>MS, M.Ed.</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>MS, M. Engr.</td>
</tr>
<tr>
<td>Microbiology and Immunology</td>
<td>MS, Ph.D.</td>
</tr>
<tr>
<td>Music</td>
<td>MM</td>
</tr>
<tr>
<td>Nursing</td>
<td>MS</td>
</tr>
<tr>
<td>Pharmacology and Toxicology</td>
<td>MS, Ph.D.</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td>M.P.T.</td>
</tr>
<tr>
<td>Physics</td>
<td>MS, Ph.D.</td>
</tr>
<tr>
<td>Psychology</td>
<td>MS, Ph.D.</td>
</tr>
<tr>
<td>Public Administration</td>
<td>MA, Ph.D.</td>
</tr>
<tr>
<td>Reading Education</td>
<td>M.P.A.</td>
</tr>
<tr>
<td>Secondary Education (see Education-General Studies)</td>
<td>MS, M.Ed.</td>
</tr>
<tr>
<td>Social Work</td>
<td>MS, M.S.W.</td>
</tr>
<tr>
<td>Sociology</td>
<td>MA</td>
</tr>
<tr>
<td>Space Studies</td>
<td>MS</td>
</tr>
<tr>
<td>Special Education</td>
<td>MS, M.Ed.</td>
</tr>
<tr>
<td>Speech and Hearing Science</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Speech-Language Pathology</td>
<td>MS</td>
</tr>
<tr>
<td>Teaching and Learning</td>
<td>Ed.D., Ph.D.</td>
</tr>
<tr>
<td>Theatre Arts</td>
<td>MA</td>
</tr>
<tr>
<td>Visual Arts (see Art)</td>
<td></td>
</tr>
</tbody>
</table>

^1 Non-thesis option is available. ^2 Non-thesis degree only.
The School of LAW

W. Jeremy Davis, 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 to educate and train legal professionals in a program blending fundamental substantive law teaching with opportunities for practical application of legal theory. The law school focuses its resources on research and service to the State, its citizens and the legal profession. Graduates are entitled to admission to the bar in the jurisdiction of their choice upon successful completion of that jurisdiction’s bar examination.

PRE-LAW STUDIES

There is no prescribed pre-law curriculum. The law school student body typically includes representatives of nearly every undergraduate field of study. The faculty of the School of Law strongly recommends a broad and liberal undergraduate program which combines rigorous and creative thinking, careful and thorough analysis and substantial oral and written communication opportunities. The major should be a subject area which interests and stimulates the student.

ADMISSION

Applicants for admission to the School of Law must be candidates for or have received a bachelor’s degree from an accredited college or university and must have taken the Law School Admission Test. Admission is competitive. Applicants accepted for the 2000-2001 entering class had an average undergraduate Grade Point Average (GPA) of 3.20 and an average LSAT score of 152.

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. Application will be accepted after the April 1 deadline with submission.

It is the policy of the School of Law to attempt to admit all qualified North Dakota residents seeking to enroll. 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.

STUDENTS IN OTHER COLLEGES OR SCHOOLS ELECTING LAW COURSES

The School of Law permits non-Juris Doctor degree candidates to enroll in law school courses on a limited basis. Undergraduate UND students will generally not be permitted to enroll in law school (JD curriculum) courses. UND graduate students may be permitted to enroll in law school courses rarely and only with the permission of the dean upon appropriate petition. Interested students should contact the School of Law for further information.

LIBRARY

The Thordarson Law Library of the School of Law has more than 263,482 volumes and equivalents, including 100,000 microform volumes and over 2,400 serial subscriptions. The facility is a research library designed to serve the legal resource needs of the students and faculty of the School of Law and of the University. In addition, the law library serves the practicing bar and citizens throughout the state of North Dakota and the northern plains region. The library subscribes to LEXIS® and WESTLAW® computer assisted legal research services.

ADDITIONAL INFORMATION

A separate catalog for the School of Law describing degree requirements, course offerings, financial aid and scholarships, student organizations and activities, faculty biographies, placement and other miscellaneous information may be requested from the office of the Dean, School of Law, University of North Dakota, P.O. Box 9003, Grand Forks, ND 58202.
The School of
MEDICINE AND HEALTH SCIENCES
H. David Wilson, M.D., Dean

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 programs of three to five years in duration (residencies) leading to eligibility for board certification in family medicine, internal medicine, general surgery and psychiatry, and a one-year transitional program;
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 Ph.D. degree; M.S. degree, and 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 physical therapy and clinical laboratory science;
7. Undergraduate programs leading to the following degrees: B.S. in athletic training, B.S. in cytotechnology, B.S. in clinical laboratory science, and B.S. in occupational therapy;
8. Undergraduate and graduate course work in anatomy and cell biology; biochemistry and molecular biology; microbiology and immunology, and pharmacology, physiology and therapeutics;
9. A physician assistant program leading to certification after one year for registered nurses who have at least four years clinical experience by time of application deadline.

Each program noted above is fully accredited by its accreditation agency.

The School of Medicine was established in 1905 and offered, until 1973, the first two years of medical education. Students transferred to other medical schools for the last two years of medical education to earn the M.D. 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, legislative action approved a four-year curriculum and authorized the granting of the Doctor of Medicine degree. This was accomplished in stages using a 2:1:1 plan by which students transferred to other medical schools for their third year and returned to UND 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 and continuing today for the quality of research and training in the biomedical sciences. Today, the institution is nationally and internationally respected for its research and training programs in cancer, cardiovascular and renal disease, environmental health, metabolic diseases, alcohol and drug abuse, vision, eating disorders and neuroscience.

The Physicians Assistant Program, established in 1970, is administered under the Department of Community Medicine and Rural Health through the Division of Health Practitioners. In 1949, the medical technology program was initiated with a B.S. curriculum, adding a M.S. program in 1978. Medical technology has since changed its name to clinical laboratory science. The occupational therapy program was initiated in 1956 as a part of the medical school. After being stationed in the College of Human Development (HRD) for a number of years, the department moved back into the medical school in 1995. The physical therapy program was initiated in 1968 and the M.S. degree in physical therapy was added in 1991. 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 the 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 of the components of the school in addressing its mission. Departments included are anatomy and cell biology; biochemistry and molecular biology; community medicine and rural health; family medicine; internal medicine; microbiology and immunology; neuroscience; obstetrics and gynecology; occupational therapy; pathology; pediatrics; physical therapy; pharmacology, physiology and therapeutics; 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 biennially 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>Course</th>
<th>Minimum Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry, including laboratory</td>
<td>16</td>
</tr>
<tr>
<td>Inorganic and Quantitative</td>
<td></td>
</tr>
<tr>
<td>Organic</td>
<td>8</td>
</tr>
<tr>
<td>Biology, including laboratory</td>
<td>8</td>
</tr>
<tr>
<td>Physics, including laboratory</td>
<td></td>
</tr>
<tr>
<td>Psychology/Sociology</td>
<td>3</td>
</tr>
<tr>
<td>Language Arts (English, Speech, etc.)</td>
<td>6</td>
</tr>
<tr>
<td>College Algebra or higher math</td>
<td></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 is also 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 four 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 CAAHEP. 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 course work. Application for advancement to the professional education component must be made during the second semester of the sophomore year. 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 several national certification examinations. In addition to certification, some states have specific requirements for licensure of clinical laboratory personnel which vary from state to state.

Cytotechnology

The Department of Pathology offers a four-year, degree-granting program leading to the Bachelor of Science in Cytotechnology. 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 in the Department of Pathology, and must be submitted by January 1 for the senior-year program beginning the following Fall semester.

Occupational Therapy

The occupational therapy program is accredited by the Accreditation Council for Occupational Therapy Education. Graduates of this four-and-one-half-year program will receive a Bachelor of Science in Occupational Therapy degree and will be able to sit for the national certification examination for the occupational therapist administered by the National Board for Certification in Occupational Therapy, Inc. The student spends the first two years as a pre-major in the School of Medicine and Health Sciences. Students are eligible to apply for admission to the occupational therapy program in the spring of their sophomore year when they are completing the required pre-professional course work. A satellite, professional-level occupational therapy program is available for Wyoming residents at Casper College, Casper, WY. Tuition and other information regarding the program is available by contacting the Occupational Therapy Department at Casper College (Telephone: 307-268-2541). Wyoming residents may call 888-699-0006.

GRADUATE PROGRAMS

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

Clinical Laboratory Science

The Division of Medical Laboratory Science in 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 teleconferencing. 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.

Physical Therapy

The physical therapy curriculum is accredited by the American Physical Therapy Association. The five-and-one-half-year program leads to the degree of Master of Physical Therapy, a rural-oriented, first professional degree.

Applications for admission to the professional program may be obtained from the Department of Physical Therapy after Jan. 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 Physician Assistant Program is administered by the Department of Community Medicine and Rural Health through its Division of Health Practitioners. This 12-month, competency-based certificate program is accredited by the American Medical Association’s Committee on Allied Health Education and Accreditation (CAHEA). Enrollment is limited to licensed registered nurses with a minimum of four years professional nursing experience and sponsorship by a practicing primary care physician. For more information contact the Department of Community Medicine and Rural Health at (701) 777-2344.

OTHER ACTIVITIES

Laboratory Education for North Dakota

The Division of Medical Laboratory Science in the Department of Pathology instituted Laboratory Education for North Dakota (LEND) as a joint program with the Department of Microbiology and Immunology in 1978. It has been solely managed by the Division of Medical Laboratory Science since 1990. The LEND Program provides distance learning opportunities for laboratory professionals and physicians in all communities in North Dakota to earn continuing education units (CEUs), continuing medical education units (CMEs), undergraduate credit and graduate credit in clinical laboratory science through distance learning. Audio-teleconferencing, videotape, interactive television, Internet and self-instructional written materials are used to deliver the courses and programs. 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. 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 practice centers, library facilities and campus offices. Affiliates 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 school has completed construction of two additions to house the basic sciences departments, the Harley French Library of the Health Sciences, classrooms and offices at the north end of the campus at the site of what was formerly known as St. Michael’s Hospital. The new additions provide state-of-the-art research laboratories and learning space for programs in health sciences. In 2000, the Biomedical Research facility, an ultra modern animal facility was completed. It provides space for biomedical research.

NORTH DAKOTA MEDICAL CENTER

The Medical Center, created by an act of the Legislature of the State of North Dakota 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

Elizabeth G. Nichols, Dean

HISTORY AND MISSION

Baccalaureate education in nursing began at UND in 1949 with the College of Nursing being founded in 1959. In 1996 the programs in nutrition and dietetics joined the College. The College of Nursing now offers professional programs in nursing and nutrition and dietetics. Undergraduate degrees are offered in nursing, community nutrition, and dietetics. Graduate specialties within the masters program include: nursing therapeutics, anesthesia nursing, health care administration, and family nurse practitioner preparation.

The baccalaureate program in nursing provides students a sound background of liberal education, preparation in all basic areas of clinical nursing practice, and a solid foundation for graduate education. Graduates of the program 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 clinical experiences for students who wish to become Registered Dietitians. Upon completion of this degree, students are eligible to take the examination for professional registration (RD). A degree in community nutrition is also available.

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 which assumes a positive regard for others and which 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 which is essential to meeting the needs of society in a constantly changing environment. The College has a distinctive responsibility to provide distance learning opportunities for access to the master’s degree program.

The college promotes improvement of nursing and health care through the conduct and dissemination of research and scholarship regionally, nationally, and internationally. The College further contributes to the well being of society through the participation of faculty, students, and graduates in service activities concerned with the quality of nursing and health care. The College of Nursing has a particular commitment to advancing the quality of health care in North Dakota.

ACCREDITATION

The graduate and undergraduate nursing programs are approved by the State Board of Nursing and accredited by the National League for Nursing Accreditation commission and have initial approval from the Commission on Collegiate Nursing Education. The nurse anesthesia program is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs.

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

NURSING PROGRAM

Students who wish to pursue a degree in Nursing should apply to the University to be admitted as Pre-Nursing majors in the College of Nursing. All persons who wish to apply for admission to the nursing major are advised to follow the suggested curriculum leading to the Bachelor of Science in Nursing (see College of Nursing listing). Since the College of Nursing strives to reflect current trends in the nursing profession, there may be on-going changes in the curriculum.

Standard Admission to the Undergraduate Nursing Program.

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. To be eligible for consideration for admission to the nursing program, the student must have: completed 24 semester hours of credit, including general chemistry, organic and biochemistry, human anatomy, introduction to psychology, introduction to sociology (cultural anthropology or social problems may be taken in place of introduction to sociology), and a course in English composition; have earned at least a 3.50 overall and UND GPA; have earned a grade of "C" or better on English composition, organic and biochemistry, psychology, sociology (or cultural anthropology or social problems), and anatomy. The College also requires a personal essay designed to provide the Admissions Committee with additional information. The College will award additional points for a student who qualified for admission within the last two years, but was not admitted. College Level Examination Program (CLEP) subject exam results will be accepted according to the current University policy.

Early Admission to the Undergraduate Nursing Program.

Students who have attained a 3.50 grade point average or higher may wish to consider an early application for admission. To qualify, students must: have a 3.50 or higher overall grade point average, have earned credit in one chemistry course, and have attained a B grade or better in two out of three of the following: Introduction to Psychology, English Composition, or Introduction to Sociology (Cultural Anthropology or Social Problems are alternates to Introduction to Sociology). Once a student is provisionally admitted under the early admission process, they must show evidence of successful completion of the standard admission requirements by June 15th (see above). The early admission process also includes a written essay.

The nursing program admits students in March (early admission) and June (standard admission) to fill the fall and spring classes. In the event of vacancies for the spring classes, a December/January review will be held. The application deadline is February 1 for early admission consideration (for fall class only), April 1 for standard admission (for fall or spring admission) and November 1 for spring admission (only if vacancies exist).

The number of students admitted is determined by the availability of faculty and clinical facilities. Selection is made on the basis of academic record and submission of the required essay. Contact the College of Nursing Director of Student and Alumni Affairs or your adviser for the specifics of the selection process and procedures.

Students may petition to establish credit through special examinations according to University policy. Equivalency of courses (e.g., sciences) 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 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. Because of the number of applicants, students cannot be guaranteed admission to the Nursing Program. All qualified students are considered on merit.

Transfer students who plan to enter the Nursing Program must fulfill the same minimum prerequisite requirements as students seeking admission from other units of the University of North Dakota. The dates for submission of the application and consideration of applicants are the same for all students.

Registered Nurses (RNs) and Licensed Practical Nurses (LPNs).

RN and LPNs interested in pursuing a bachelors degree are considered for admission as transfer students. An upper division RN/BSN completion track which builds upon previous learning is available for part-time
or full-time students. Further information concerning the progression of the RN/LPN student can be obtained by contacting the College of Nursing. Transcripts of previous academic work must be submitted as part of the application to the University and to the Nursing Program.

The University of North Dakota College of Nursing is a member of the Agassiz Region Nursing Education Consortium (ARNEC).

DEGREE REQUIREMENTS FOR GRADUATION

All candidates for the degree, Bachelor of Science in Nursing, must fulfill the following requirements:

1. Completion of all University graduation requirements, including residence, as well as the required courses in the College of Nursing. See General Education Requirements and College of Nursing listings.
2. A minimum of 129 semester hours.
3. A minimum grade point average of 2.50 overall.

PROGRESSION AND CLINICAL REQUIREMENTS AFTER ADMISSION

Students should note that nursing courses are sequenced to build on one another over six 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.

1. A 2.50 overall GPA is required for progression at the end of the sophomore year and each semester thereafter.
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 within the College of Nursing.
3. A student earning a ‘‘D’’ or an ‘‘F’’ in a clinical nursing course may repeat that course once.
4. A student may only repeat one clinical nursing course.

5. The following verifications are required of sophomore, junior, and senior students for admission to nursing classes, labs, and clinicals:
   a. current CPR certification by the American Red Cross or American Heart Association to include adult, child and infant; including one- and two-man CPR.
   b. initial negative 2-step tuberculin skin tests and a negative skin test annually thereafter or, if positive, medically certified absence of symptoms; and
   c. current medical/hospitalization insurance or certification of assumption of full responsibility for any health treatment costs incurred.
   d. A hepatitis B vaccine series.
   e. proof of immunity to measles (rubeola), mumps, and rubella.
   f. proof of immunity to chicken pox (varicella).
   g. documentation of attendance at OSHA Inservice.

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 Office of the Dean of the college, and are available in the College of Nursing Undergraduate Student handbook.

ADDITIONAL EXPENSES

In addition to the regular university tuition and fees, nursing students are charged a nursing program fee each semester. Costs of laboratory tests 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 at the College of Nursing.

Students are responsible for transportation related to clinical experience. Use of a car, especially for parent-child and community health nursing is necessary. Students may complete the practicum course at a distant site. There are travel and housing costs associated with that affiliation.

Students in the nursing program are eligible to apply for federal nursing student loans and/or North Dakota State Nursing Scholarship Loans and institutional grants.

SCHOLARSHIPS

Each year Nursing majors may apply for College of Nursing Scholarships. Awards and criteria are listed in the College of Nursing Undergraduate Student Handbook. Selection is based on a variety of factors including GPA, financial aid, interest, and nursing ability. Additional information is available from the College.

COOPERATIVE EDUCATION

Cooperative education experiences are offered through the College to students who have completed sophomore level nursing courses. 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 specific 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 agencies.

STUDENT ORGANIZATIONS

Student Societies: NSAs the nursing student’s pre-professional organization. UND-NSA is affiliated with the North Dakota Student Nurses Association and the National NSA.

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

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. Students interested in graduate study may contact the Director of Graduate Studies in the College of Nursing or consult the Graduate School section of this Catalog for further information.

NUTRITION AND DIETETICS

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 Pre-Dietetics or Community Nutrition major. Majors within the Department are advised to follow the appropriate suggested 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 changes in the curriculum since the Department of Nutrition and Dietetics strives to reflect current trends in the profession.

COORDINATED PROGRAM IN DIETETICS

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 preprofessional courses (see department list-
ing). Criteria for admission include a grade of “C” or better in all nutrition, food and science courses with a minimum GPA of 2.6 and a demonstrated interest in the field of dietetics.

To be eligible for consideration, the student must submit the application form with a letter stating professional goals and describing personal qualities which would assist in attaining these goals, request references from two individuals and complete 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 currently enrolled in Pre-Dietetics 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 reacceptance application. Reacceptance 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. 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.

Progression requirements. The student must earn a grade of “C” or better in all nutrition, food and science courses taken to fulfill requirements of the Community Nutrition major and must maintain 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 advisor 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 didactic 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 university student organization, 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 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 data sheet and transcript are 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 appropriately
ate 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 four-year, degree-granting college.

To declare a major and advance their records, the 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 records from Student Academic Services.

PROGRAM PLANNING

In most cases the University recommends that a student’s first year be devoted to broad preparation for later specialization. This is particularly important for the undecided student, who may wish to test his or her capacities and interests in various directions before making a final decision about a major field of concentration.

Many new students devote much of their first year of coursework to satisfying the University’s general education requirements, which must be completed by all undergraduate students no matter which school or college they eventually enter to become degree candidates. The general education requirements form a core of learning that the 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 concentration 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.

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 200 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, theaters, 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. In some instances courses may be taught in sequence. Normally, a student will not be allowed to enroll in more than 15 semester hours during the twelve-week Summer Session.

Special dates are provided in the Summer Session Time Schedule of Classes.

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 Session Bulletin/Time Schedule of Classes, which is published in the spring of each academic year and provided on the UND home page at www.und.edu, or contact the Summer Session Office, University of North Dakota, P.O. Box 8375, Grand Forks, ND 58202-8375.
Accounting

H. Wilde (Chair), Altepeter, Beard, Carlson, Dosch, Ellingon, Hansen, Harmeson, Hiltner, Loyland, Ness, Segovia, and Wambshans

College of Business and Public Administration

The Department of Accounting 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

The primary mission of the Department of Accounting is to prepare students for careers in accounting and business in the Northern Plains region of the United States. 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

Accounting faculty offer two programs—the Bachelor of Accountancy (B.Acc.) and the Bachelor of Business Administration with a major in Accounting (B.B.A.). The B.Acc. program is designed for students interested in becoming Certified Public Accountants (CPA) or Certified Management Accountants (CMA). The CPA and CMA are national designations that, at the minimum, require passage of a qualifying examination. Requirements to sit for the CMA examination are established by the Institute of Management Accountants, a private nongovernmental organization. In contrast, the requirements to sit for the CPA examination are governed by individual states (more about the CPA examination below). The B.Acc. is designed to meet the educational requirements of these examinations. As a result, the B.Acc. program is very structured, with few electives in accounting or business. The B.B.A. provides some flexibility for students to tailor their programs of study. As such, it is designed primarily for individuals seeking to add a minor or a double major to their accounting program. Individuals interested in pursuing less specialized careers may also choose the B.B.A. as there are several elective hours available.

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:

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course 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 217</td>
<td>Fundamentals of Management Information Systems</td>
<td>4</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>Intro to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 303</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>Math 104</td>
<td>Finite Mathematics</td>
<td></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 301</td>
<td>Production 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 Fundamentals</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 Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anth 171</td>
<td>Introduction to Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>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 Requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 218</td>
<td>Computer Applications in Business</td>
<td>2</td>
</tr>
<tr>
<td>Acct 301.302</td>
<td>Intermediate Accounting I &amp; II</td>
<td>4, 3</td>
</tr>
<tr>
<td>Acct 309</td>
<td>Accounting Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>Acct 316</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>Acct 320</td>
<td>Accounting for Production</td>
<td>3</td>
</tr>
</tbody>
</table>

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 the 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

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

The University publishes an official timetable of classes 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. On request to Enrollment Services, a copy of the timetable will be mailed.

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 specific 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.
According to North Dakota law and rules of the North Dakota State Board of Accountancy, students 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.

Both the B.Acc. and the B.B.A. programs meet the current requirements for accounting and business courses. Neither program meets the 150 hour requirement. Students interested in becoming CPAs should be prepared to either extend their undergraduate program by an additional 25 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).

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

## Courses

### 200. Elements of Accounting I. (CCN) 3 credits.
Basic principles of the complete accounting cycle: F.S.

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

### 207. Managerial Accounting. (CCN) 2 credits.
Prerequisite: Acct 201 or Acct 275. The application of accounting concepts and techniques to managerial problems of planning, control and decision making. For non-accounting majors only. F.S.

### 218. Computer Applications in Business. (CCN) 2 credits.
Prerequisite: ISys 217. Prerequisite or Corequisite: Acct 201. The fundamentals of digital computer programming using Electronic Spreadsheets with special emphasis on business applications. F.S.

### 275. Accounting for Pre-MBA. (CCN) 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.
Prerequisites: Acct 201 and 218. Concepts, time value of money, current assets, current liabilities, plant and equipment, and intangibles. F.S.

### 302. Intermediate Accounting II. 3 credits.
Practicum. Corporations, long-term liabilities, investments, statement analysis, and cash flow statement. F.S.

### 306. Cost Accounting II. 3 credits.
Prerequisites: Acct 320, Econ 210. Analytical applications of accounting information for product costing, financial reporting, executive decision making, and organizational planning and control. F.S.

### 309. Accounting Information Systems. 3 credits.
Prerequisites: Acct 301. 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 205 and 218. Financial accounting, control, and reporting for governmental and not-for profit entities. F.S.

### 320. Accounting for Production. 3 credits.
Prerequisites: Acct 201 and 218. Principles and techniques used to account for and analyze costs incurred to produce products or services. F.S.

### 380. International Accounting. 3 credits.
Prerequisite: Acct 201 and junior standing. 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.

### 401. Advanced Accounting. 3 credits.
Prerequisites: Acct 302. Special problems in accounting including consolidated statements, partnerships, and foreign exchange. F.S.

### 403. Contemporary Accounting Theory. 3 credits.
Prerequisites-Corequisites: Acct 401 or consent of instructor. 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. Auditing. 3 credits.
Prerequisites: Acct 302, 309, Econ 210. Procedures, duties, responsibilities and ethics of an auditor; problems that arise in the course of an audit. F.S.

### 406. Auditing Problems. 3 credits.
Prerequisites: Acct 405 or consent of instructor. The application of auditing theory to practical problems. F.S.

### 410. Federal Individual Income Tax. 3 credits.
Prerequisites: Acct 201. 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. 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. 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. Corequisite: Acct 405. Critical analysis of contemporary issues in accounting. Written and oral presentations are required.

### 494. The Literature of Accounting. 1-3 credits, repeatable to 6 credits.
Prerequisite: consent of instructor. Directed studies in the recognized journals, periodicals, and professional publications of the field.
Anatomy and Cell Biology
(Anat)

E. Carlson (Chair), Atkinson, Carr, Dunlevy, Grove, Hunt, Jackson, McCormack, Rada, Rieke, Ruit, and Smyser

Courses

204. Anatomy for Paramedical Personnel. 3 credits. This series of three lectures per week presents a systematic study of the human body. F.S

204L. Anatomy for Paramedical Personnel. 2 credits. A basic laboratory 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 for one or more students. F.S.SS

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

Anthropology
(Anth)

J. A. Williams (Chair), Lang, Leach, and Schneider

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 and museums. American anthropology is divided into four main sub-areas—archaeology, cultural anthropology, linguistics, 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 A MAJOR IN ANTHROPOLOGY

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

I. General Education Requirements (see University GER listing).

II. The Following Curriculum:

<table>
<thead>
<tr>
<th>33 Major Credits including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anth 170. Introduction to Biological Anthropology. (3)</td>
</tr>
<tr>
<td>Anth 171. Introduction to Cultural Anthropology. (3)</td>
</tr>
<tr>
<td>Anth 172. Introduction to Archaeology and World Prehistory. (3)</td>
</tr>
<tr>
<td>Anth 480. Senior Capstone Seminar. (3)</td>
</tr>
<tr>
<td>Method and Theory. (3)</td>
</tr>
<tr>
<td>3 hours from (Cultural)</td>
</tr>
<tr>
<td>Anth 371. Cultural Dynamics. (3)</td>
</tr>
<tr>
<td>Anth 372. Culture Theory. (3)</td>
</tr>
<tr>
<td>Anth 350. Ethnographic Methods. (3)</td>
</tr>
<tr>
<td>3 hours from (Archaeology)</td>
</tr>
<tr>
<td>Anth 300. Archaeological Laboratory Methods. (3)</td>
</tr>
<tr>
<td>Anth 380. Field Techniques in Archaeology. (1-6)</td>
</tr>
<tr>
<td>Anth 388. Method and Theory in Archaeology. (3)</td>
</tr>
<tr>
<td>Anth 426. Lithic Technology. (3)</td>
</tr>
<tr>
<td>3 hours from (Physical)</td>
</tr>
<tr>
<td>Anth 325. Human Origins. (3)</td>
</tr>
</tbody>
</table>

Anth 330. Human Variation. (3) |
Anth 335. Primates. (3) |
Anth 378. Physical Anthropology Method and Theory. (3) |
Electives. Required in other departments:
A concentration in a single supplementary field other than anthropology is also required of all anthropology majors. This concentration may be met in two ways: (1) a language proficiency of level IV in a modern foreign language; or (2) 20 credits hours, at least 9 of which must be numbered 300 or above, in any single subject matter taught at this university.

MINOR IN ANTHROPOLOGY

Required 21 credits including:

| Anth 170. Introduction to Biological Anthropology. (3) |
| Anth 171. Introduction to Cultural Anthropology. (3) |
| Anth 172. Introduction to Archaeology and World Prehistory. (3) |
| 3 hours from. (3) |
| Anth 380. Field Techniques in Archaeology. (1-6) |
| Anth 388. Method and Theory in Archaeology. (3) |
| Anth 426. Lithic Technology. (3) |
Electives in Anthropology. (3) |

Courses

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

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.

172. Introduction to Archaeology and World Prehistory. 3 credits. An introduction to 1) the basic field and laboratory methods used by archaeologists as they seek to describe and explain the events of world prehistory, and 2) the major milestones in the evolution of societies, including the cultural advancements of our earliest hominid ancestors, the three million year-long persistence of the hunting and gathering lifestyle, the origins of agriculture, and the rise and collapse of civilizations.

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

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.


330. Human Variation. 3 credits. 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.

345. Forensic Science. 3 credits. An exposure to the basic methods and theoretical bases and inter-relationships of the forensic sciences. A major emphasis is placed on death investigation. F.S

346. Analysis of Forensic Evidence. 3 credits. Prerequisite: Anth 345. Emphasis on the practical applications of the forensic sciences. Whenever possible and practical hands-on exercises will reinforce course topics. F.S

350. Ethnographic Methods. 3 credits. Prerequisite: Anth 171 or by special permission. Introduction to fieldwork methods and analytical 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 170, 171, or 172 or consent of instructor. Fundamentals of modern linguistics; utility of linguistic concepts of culture analysis; interaction of language with other cultural subsystems. S

371. Special Topics. 1-4 credits. Repeatable when topics vary. F.S

Anthropology
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, ethnics, and anthropologists' roles with respect to public policy. F.

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. Indians 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.

374. Old World Prehistory. 3 credits. Prerequisites: Anth 172. The growth and development of human culture in Africa, Asia, and Europe, from early prehistoric times in these regions to the beginning of farming communities. Major archaeological sites will be critically examined and an interdisciplinary approach will be stressed. 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. Examines the fascinating cultural developments that have taken place throughout prehistory in North America (north of Mexico), ranging from the first peopling of the Americas to the emergence of complex chiefdoms, and from hunting and gathering to the development of intensive agriculture. On demand.

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. S

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. F/S

380. Field Techniques in Archaeology. 1-6 credits. Prerequisites: Anth 172; and consent of instructor. S

388. Method and Theory in Archaeology. 3 credits. Prerequisites: Anthro 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. S

426. Lithic Technology. 3 credits. Prerequisites: Anth 172 or consent of instructor. Study of prehistoric stone tool technology and examination of the analytical methods used by archaeologists in lithics research. F/S

440. Forensic Anthropology. 3 credits. Prerequisites: Anth 170 or consent of instructor. The description of the human skeleton with emphasis on forensic applications.

441. Forensic Anthropology Field School. 6 credits. 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 the maintenance of health and the handling of illness in non-Western and modern societies. S

480. Senior Capstone Seminar. 3 credits. Prerequisite: Anth 171 or consent of instructor. Examination of current major issues and areas 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


494. Readings in Anthropology. (CCN) 1-5 credits. Prerequisites: Anth 170, 171, or 172 and 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

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), three-dimensional (ceramics, sculpture, fibers, metalsmithing), history of art, art education and study in computer/digital media. 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 award-winning structure of the Edmund Hughes Fine Arts Center provides more than 35,000 square feet for specialized studios and opportunities for work in the various 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 ART

The Bachelor of Fine Arts program in Art is offered to students with marked abilities who desire an intensive undergraduate concentration in visual arts, 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, which 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.

Required 132 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

1. General Education Requirements (see University GER listing)
2. The Following Curriculum:

   - Core Requirements: 1. Art 108: Hand & Power Tool Safety (1)
   - Art 122, 124: Two-dimensional Design and Three-dimensional Design (6)
   - Art 130, 230: Drawing I, II (6)
   - Art 210: History of Art I (3)
   - Art 211: History of Art II (3)
   - Art 231: Figure Drawing I (3) and 18 credits from:
     - Art 200, 201: Sculpture I, II (3, 3)
     - Art 204, 205: Jewelry I, II (3, 3)
     - Art 220, 221: Painting I, II (3, 3)
     - Art 232: Figure Drawing II (3)
     - Art 240: Printmaking I: Intaglio (3)
     - Art 241: Printmaking I: Relief and Serigraphy (3)
     - Art 242: Printmaking I: Lithography (3)
     - Art 245: Black and White Photography I (3)
     - Art 246: Black and White Photography II (3)
     - Art 250: Ceramics I (3)
     - Art 253: Ceramics II: Throwing (3)
     - Art 260: Slide Photography (3)
     - Art 261: Color Printing (3)
     - Art 270: Digital Media I (3)
     - Art 274: Calligraphy (3)
     - Art 276: Surface Design on Fabric (3)
     - Art 277: Fibers I (3)

   Before advancement to upper-division status, all B.F.A. candidates must participate in review and evaluation by the departmental faculty.

   - Major Area Courses:
     - At least 24 credits must be completed (including 200-level courses) in one of the following media areas:
       - Ceramics
       - Drawing
       - Fiber
       - Painting
       - Photography
       - Printmaking
       - Sculpture

     Upper-level students are required to complete a MINIMUM of 38 credits in courses selected from the following list:
     - Art 302, 303: Sculpture III, IV (3, 3)
     - Art 304, 305: Jewelry & Small Sculpture I, II, III, IV, V (3, 3, 3, 3)
     - Art 306, 307

   The Bachelor of Fine Arts program in Art is offered to students...
### Core Requirements:

1. **Art 108** Hand & Power Tool Safety ............................................ (1)
2. **Art 130, 230** Drawing I, II ....................................................... (6)
3. **Art 122, 124** Two-dimensional Design and Three-dimensional Design ........................................ (6)
4. **Art 210** History of Art .......................................................... (3)
5. **Art 211** History of Art .......................................................... (3)

### Plus at least 9 credits in the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art 200</td>
<td>Sculpture I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>Art 204, 205</td>
<td>Jewelry I, II</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 220, 221</td>
<td>Painting I, II</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 223</td>
<td>Figure Drawing I, II</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 240</td>
<td>Printmaking I: Intaglio</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 241</td>
<td>Printmaking I: Relief and Serigraphy</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 242</td>
<td>Printmaking I: Lithography</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 245</td>
<td>Black and White Photography I</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 246</td>
<td>Black and White Photography II</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 250</td>
<td>Ceramics I</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 253</td>
<td>Ceramics II: Throwing</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 260</td>
<td>Slide Photography</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 261</td>
<td>Color Printing</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 270</td>
<td>Digital Media I</td>
<td>(3)</td>
</tr>
</tbody>
</table>

### MINOR IN ART EDUCATION (Middle or Secondary)

See Minor in Art (Studio) above.

### B.S.ED DEGREE WITH A COMBINED MAJOR IN ELEMENTARY EDUCATION AND ART

For curriculum outline see the Teaching and Learning listing.

#### Courses

1. **100. Introduction to Sculpture.** 3 credits. Introduction for non-majors to sculpt-ural materials, process and concepts. F,S
2. **108. Hand & Power Tool Safety.** 1 credit. Lectures and demonstrations of power machinery and hand tools with emphasis on safety in practical application. Skills acquired equip the student for advanced courses in all media areas. F,S
110. Introduction to the Visual Arts. (CCN) 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, sociological and philosophical applications of art. F,S

120. Introduction to Drawing and Color Materials. 3 credits. Introduction for non-majors to drawing and color media and techniques. Includes working with still-lifes, models, and landscapes. F,S

122. Two-Dimensional Design. (CCN) 3 credits. Basic concepts of 2-dimensional design as they apply to the fine and applied arts are learned through projects with various media, black and white and color. F,S

124. Three-Dimensional Design. (CCN) 3 credits. Prerequisite: Art 122. Basic concepts of 3-dimensional design as they apply to the fine and applied arts are learned through projects with various media. F,S

130. Drawing I. (CCN) 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. F,S

135. 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. F,S

200. Sculpture I. 3 credits. Prerequisites: Art 108,124. Introduction to philosophy, aesthetics, history and processes of sculpture. Demonstrations in the use of metals, stone, clay, plaster, wood, etc. F,S

201. Sculpture II. 3 credits. Prerequisite: Art 200. Continuation of Sculpture I. F,S

204. Jewelry I. (CCN) 3 credits. A comprehensive laboratory understanding of non-ferrous metals and their manipulation is presented, leading to a proficiency for the making of body adornments and simple fabricated objects. Includes designing, piercing, soldering, forming and casting. F,S

205. Jewellery Making II. 3 credits. Prerequisite: Art 204. A continuation and expansion of basic skills and concepts developed in Jewelry Making I. F,S


211. History of Art II. (CCN) 3 credits. Study of western art from Renaissance to present. S

220. Painting I. 3 credits. Prerequisite: Art 230. Experimentation with oil painting and associated media with emphasis upon creative compositions, using models, still-life subjects and imaginative contemporary expressions. F,S

221. Painting II. 3 credits. Prerequisite: Art 220. Continuation of concepts and techniques explored in Painting I. F,S

230. Drawing II. (CCN) 3 credits. Prerequisite: Art 130. Advanced study and application of different drawing media, methods, and techniques. A continuation of the skills and development of Drawing I. F,S

231. Figure Drawing I.(CCN) 3 credits. Prerequisite: Art 230. Study and application of different drawing media, methods, and techniques. Expressive and analytical drawing of the figure. Work is done in varied media, varied techniques and varied conceptual approaches to help students develop visual expressive skills. F,S

232. Figure Drawing II. (CCN) 3 credits. Prerequisite: Art 231. Advanced study and application to different media, methods, and techniques. Continuation of problems introduced in Figure Drawing I. F,S

240. Printmaking I: Intaglio. 3 credits. Survey of intaglio processes, including etching, engraving, aquatint, etc. on line and plastic. F

241. Printmaking I: Relief and Serigraphy. 3 credits. Survey of relief andserigraphic print processes. S

242. Printmaking I: Lithography. 3 credits. Survey of lithography processes, including drawing and washes. F

245. Black and White Photography I. 3 credits. Introduction to black and white photography in a technical art environment. Emphasis is placed on understanding of fine art photography through the practice of visualization and print making. Course work includes an introduction to basic black and white film and paper processing. F,S

246. Black and White Photography II. 3 credits. Applications of black and white photography in a visual arts environment. Emphasis will be placed on composition, lighting and subject content as it supports fine art photography. Course content includes lessons in historical processes. S

250. Ceramics I. (CCN) 3 credits. Introduction to ceramics techniques. A beginning course for majors. Proficiency in the basic hand forming processes and glaze techniques and an understanding of the clay and firing processes are achieved through lectures, discussions, demonstrations, and readings. F,S

253. Ceramics II: Throwing. 3 credits. Prerequisite: Art 151 or 250 or permission of instructor. Throwing is the process by which a form is made by working with the hands and on the potter’s wheel. During the first semester emphasis is placed on centering the clay on the wheel and mastering the basic bowl and bottle forms. F,S

260. Color Photography. 3 credits. A beginning non-photographic oriented class in color photography emphasizing the aesthetic, design and compositional aspects of this artistic medium. SU, graded only. F,S,SS

261. Color Printing. 3 credits. Prerequisite: Art 260 or instructor approval. This beginning course in color printing is designed as a complementary follow up course to Slide Photography. Art 260. SU grading only. F

270. Digital Media I. 3 credits. An introduction to 2D computer-based imaging (image creation, enhancement, and manipulation) and concepts of visual communication. Students will acquire a basic level knowledge of vector-based and pixel-based software. Alternative presentation methods of digital images will be explored in the final project. F,S

274. Calligraphy. 3 credits. Lettering styles in Gothic, Roman and Script, utilizing several media and techniques; studies of the importance of lettering in advertising and illustrations. F,S

276. Surface Design on Fabric. 3 credits. Prerequisite: Art 122. Exploration of technical and design possibilities of various surface embellishments on fabric (printed, dyed). Demonstrations/lecture/studio work. F

277. Fibers I. 3 credits. Samples and finished art projects of student’s design carried out exploring technical and design possibilities of various textile techniques. Demonstrations/lecture/studio work. F

302. Sculpture III. 3 credits. Prerequisite: Art 201. Continued involvement in advanced sculpture processes and emphasis on personal style development. F,S

303. Sculpture IV. 3 credits. Prerequisite: Art 302. Continuation of Sculpture III. F,S

304. Jewelry and Small Sculpture I. 3 credits. Prerequisite: Art 205 or consent of instructor. Specialized techniques and processes of metal fabrication ranging from body adornment to small sculptural objects with emphasis on design, concept and craftsmanship. F

305. Jewelry and Small Sculpture II. 3 credits. Prerequisite: Art 304 or consent of instructor. Continuation and expansion of Jewelry and Small Sculpture I. S

306. Jewelry and Small Sculpture III. 3 credits. Prerequisite: Art 305. Continuation of advanced jewelry and metalsmithing processes with emphasis placed on development of personal expression through the medium of metal. F

307. Jewelry and Small Sculpture IV. 3 credits. Prerequisite: Art 306. Continuation of Jewelry and Small Sculpture III.

311. Time-based Media. 3 credits, repeatable to 6. Prerequisite: Art 270. The course engages the students to explore various methods of working with elements of time and motion. Students will explore extracting and redefining visual units of time through media ranging from video to animation, performance, and installation. F,S

322. Painting III. 3 credits. Prerequisite: Art 221. Further development of painting concepts, comprehension and search of various media and styles. The course stresses the focus of one’s attitudes towards developing a more personal visual statement in areas of personal interest. F,S

323. Painting IV. 3 credits. Prerequisite: Art 322. Continuation of Painting III. F,S

332. Figure Drawing III. 3 credits. Prerequisite: Art 231 or consent of instructor. Using the human figure as a basis for searching out presentation of plastic form, design and content. Traditional and experimental searching in various media, styles, forms. F,S

333. Figure Drawing IV. 3 credits. Prerequisite: Art 332. Continuation of Figure Drawing III. F,S

340. Printmaking II: Lithography. 3 credits. Prerequisite: Art 240 or 241. Basic black and white lithographic processes. F

341. Printmaking III: Plate and Color Lithography. 3 credits. Prerequisite: Art 340. Advanced work in stone lithography to include color processes. Introduction to plate lithography and related photographic procedures. S

342. Printmaking II: Intaglio. 3 credits. Prerequisite: Art 240. Intaglio work to include metal and plexiglas plates. Elaboration on the use of techniques, including soft ground, sugar lift, and the double print process. Introduction to multicolor print- ing and experimental survey of contemporary printmaking. F/S

343. Printmaking III: Intaglio. 3 credits. Prerequisite: Art 342. Continuation of Printmaking II: Intaglio. F,S

344. Printmaking II: Serigraphy. 3 credits. Prerequisite: Art 241. Investigation of screen printing techniques with professional quality, non-toxic materials and a full range of stencil systems including experimental approaches. F,S

345. Printmaking III: Serigraphy. 3 credits. Prerequisite: Art 344. Continuation of Printmaking II: Serigraphy. F,S

351. Ceramics II: Sculpture. 3 credits. Prerequisite: Art 124 or 125 or 251 or consent of instructor. A sculptural approach to clay is explored with emphasis on the creation of various forms. F,2

352. Ceramics III: Throwing. 3 credits. Prerequisite: Art 253. Devoted to more complex problems such as throwing larger pieces, multiple-sectioned forms, sets of forms and lidded pieces. F,S

355. Clay & Glazes. 3 credits. Prerequisite: Art 151. This is a technical approach to the raw materials used in ceramics. The various processes of calculating, mixing, evaluating, and refining both clay and glazes are explored. Through lectures, readings and laboratory test work, a basic understanding of clay and glazes is achieved. S

357. Raku. 3 credits. Prerequisites: Art 151 and 253. Raku is a rapid low fire process with traditional roots in China and Japan. The American application of that process has expanded both the technique and its aesthetic. The raku class explores both the cultural foundation and the American technique within the context of the creative process. F/2

365. Photography Studio I. 3 credits. repeatable to 6. Prerequisite: Art 260 or 245 or 246 or consent of instructor. Refinedment of conceptual and formal qualities in silver or non-silver process photographic projects using color or black and white or digital techniques. The scope of work and media will be determined by contractual arrangement between student and instructor. F,SS

366. Photography Studio II. 3 credits. Prerequisite: Art 261. Repeatable to 6. Prerequisite: Art 365 or consent of instructor. Further development of conceptual and formal qualities in silver or non-silver process photographic projects including color or black and white or digi-
370. Applied Visual Strategies. 3 credits. Prerequisite: junior standing. A studio/seminar course that examines conceptual practices in contemporary visual art and the relationship of those practices to art, artists and viewers within the western culture. The emphasis of the course will be on the application of these ideas and strategies through artistic production. F, S

371. Fibers I. 3 credits. Course work will consist of sample making and sustained projects woven on the loom. Techniques taught include yarn dyeing, finishing, and structure and pattern in weaving. F, S

372. Fibers II. 3 credits. Prerequisite: Art 371. A continuation of skills acquired in Fibers II. This course will deal with double-weave loom construction processes and other multiple layer possibilities. F, S

373. Fibers IV. 3 credits. Prerequisite: Art 372 or 374. An introduction to digital video: live image sequencing, manipulation, and composing. Medium specificity, site, audience, and creation of installation using digital 2D/video images will be explored in the final project. F, S

375. Brush Lettering and Sign Painting. 3 credits. Prerequisite: Art 122. A continuation of Calligraphy; further practical knowledge of the applications of free-hand brush lettering; layout techniques; materials involved. F, S

389. Color Theory. 3 credits. Prerequisite: Art 122. Advanced experimentation with color phenomena, light & pigment theory through historical, theoretical and practical approaches. S

385. Multimedia. 3 credits, repeatable to 6. Prerequisites: Art 270, 311. Exploration of non-linear digital presentation concepts and methods in compiling graphics, video, text, and sound. An overview of multimedia in the fields of interactive graphics, on-screen visual communication, and web design.

391a. Special Topics. 1-4 credits, repeatable to 8 between a & b. 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. Letter grade only. F, S

391b. Special Topics. 1-4 credits, repeatable to 8 between a & b. 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. S-U grade only. F, S

397. Cooperative Education. Part-time, fall and spring. 1-3 credits. Repeatable to 3 credits only. Full-time, fall, spring, and summer, 8 credits, not repeatable or interchangeable with exception of agreement among student, Department and employer prior to enrollment. Special permission is required. Regular grading only. F, S

410. History of Art: Selected Topics. 1-4 credits. Study of varied topics in the history of art and architecture. May be repeated as title changes. F, S, S

411. History of Art: Study of Eastern Art from Proto-literate Periods to the Present. 3 credits. Prerequisites: Art 210 and 211. Study of the arts of Asia with emphasis on China, Japan, and Indian sub-continent in terms of the morphology and symbolism. S

412. History of Art — 19th Century. 3 credits. Prerequisites: Art 210 and 211. Study of major artists and artistic expressions since 1875 and their relation to the "art of making art" within the theoretical and cultural contexts of the 20th Century. F

413. History of Art: Contemporary. 3 credits. Study of contemporary artists and emerging artistic trends, beginning with Post-Modernism, with an emphasis on social, cultural and economic contexts that determine artistic production-theory and practice, art contents, cultural and political contexts. F, S

415. History of Art: Museum Internship. 1-3 credits. The Museum Intern will work with the history of art faculty to select an exhibition to research, to prepare a written paper and to present publicly. F, S

416. History of Art: Renaissance, Baroque, Rococo. 3 credits. Prerequisites: Art 210 and 211. Study of the architecture, sculpture, and painting of the Renaissance through the late seventeenth and eighteenth century Baroque, and Rococo stylistic interpretations. S, F

419. History of Art: 19th Century Art and Architecture. 3 credits. Prerequisites: Art 210 and 211. Study of the major artists and artistic movements embedded in Neo-Classical, Romantic, Realism traditions from 1700 to 1873. F, S

420. History of Art: Greek and Roman Art and Architecture. 3 credits. Prerequisites: majors — Art 210 and 211, for non-majors — no prerequisites. Study of ancient Greek work from Geometric to Hellenistic and Rome and its empire from Republican to later Hellenistic to Constantinian times. F, S

421. History of Art: Computer Applications in the History of Art. 1 credit repeatable to 4 credits. Prerequisites: Art 210 and 211. This course is intended as an introductory course on computer software applications in the history of art. Students are able to study visual concepts in any media to explore paint, programs, animation, image manipulation and enhancement, CAD, 2D/3D modeling in the computer studio. F, S, S

422. History of Art: Computer Internship. 1-3 credits. Prerequisites: Art 210, 211, and 421. The Computer Intern will work with the history of art faculty to work on a MacroMedia Director project, CAD project, or design project and prepare a written paper and CD-ROM/disc for public presentation. F, S, S

460. Methods, Materials and Philosophy: Art in the Elementary Classroom. 3 credits. Prerequisite: 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-dimensional and 3-dimensional projects, featuring multi-cultural and disciplined-based education. F, S

498. Special Projects/Independent Research. 1-6 credits, no more than 12 in each media. Prerequisite: Permission of instructor or chairperson. Research and creative experiences within a specific area of interest in the Visual Arts with emphasis on refinement of aesthetic applicational techniques and media. Sculpture, History of Visual Arts, Painting, Drawing, Printmaking, Ceramics, Visual Arts Education, Fibers, Mixed Media, Jewelry, Photography. F, S, S

The College of Arts and Sciences offers a limited number of non-departmental courses. Arts and Sciences 250 and 294 are non-departmental, and are intended to serve a variety of purposes. 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 250 or 294 should present their proposals in writing to the Dean of the College. No more than 21 credits may be earned in any combination of these courses over four years.

Courses

225. Introduction to the Study of Women. 3 credits. An introduction to the study of women as subjects of scholarly inquiry, with emphasis on assessments of women’s contributions to Western culture. The course will provide an interdisciplinary focus on the central issues and questions posed by the new scholarship on women, and introduce students to the perspectives and methodologies of a variety of disciplines. F, S

250. Arts and Sciences. 1-4 credits in any one course; note credit limitations mentioned above. 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. F, S, S

294. Arts and Sciences. 1-4 credits in any one semester; note credit limitations mentioned above. Specially arranged tutorials 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. F, S, S

351. Introduction to Law and Legal Studies. 3 credits. Segments on Contracts, Criminal Law, Constitutional Law, and Torts, taught in conjunction with a law school course to acquaint undergraduates and others interested in exploring a career in the legal professions with law school methodology and legal analysis. F, S

480. Feminist Theory. 3 credits. Feminist theory examines the foundations of American feminism from enlightenment liberal to postmodern and standpoint theories. The course first develops then critiques these foundational approaches. 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 combination of the two.

Athletic Training

(See Family Medicine listing)

Atmospheric Sciences

(M. Poellot (Chair), Grainger, Hurley, Osborne, and Remer)

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 Master of Science degree (see
The Department of Atmospheric Sciences has several unique research and teaching facilities. The Regional Weather Information Center supports operational weather analyses, forecasting, and broadcast. This facility allows students to participate in operational forecasting. Several teaching laboratories for use in cloud physics, air chemistry, and radar meteorology are also available. Two primary research facilities, a 5-cm wavelength Doppler weather radar and an instrumented Cessna Citation II research jet aircraft, are deployed in national and international research programs. Students are provided opportunities to participate in this research at the undergraduate level. Current research areas include radar meteorology, surface transportation meteorology, climate analysis, cloud physics, aviation meteorology and weather modification.

### 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. Core for Atmospheric Sciences requirements, see Atmospheric Sciences listing.
III. The following curriculum:

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<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Math 265</td>
<td>AtSc 210</td>
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<tr>
<td>Physics 251</td>
<td>AtSc 220</td>
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<tr>
<td>AtSc 340</td>
<td>Math 103</td>
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<tr>
<td>AtSc 360</td>
<td>Phys 251</td>
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### DR. DEGREE IN ATMOSPHERIC SCIENCES

Graduate school listing. The degree is awarded in the John D. Odegard 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, forecasting, and broadcasting. This facility allows students to participate in operational forecasting. Several teaching laboratories for use in cloud physics, air chemistry, and radar meteorology are also available. Two primary research facilities, a 5-cm wavelength Doppler weather radar and an instrumented Cessna Citation II research jet aircraft, are deployed in national and international research programs. Students are provided opportunities to participate in this research at the undergraduate level. Current research areas include radar meteorology, surface transportation meteorology, climate analysis, cloud physics, aviation meteorology and weather modification.

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II. Core for Atmospheric Sciences requirements, see Atmospheric Sciences listing.
III. The following curriculum:

#### Freshman

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<thead>
<tr>
<th>Course</th>
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<tr>
<td>Engl 110, 125</td>
<td>College Composition I, Technical &amp; Writing</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 165, 166</td>
<td>Calculus I, II</td>
<td>(4)</td>
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<tr>
<td>AtSc 110</td>
<td>Meteorology I</td>
<td>Social Science (3)</td>
</tr>
<tr>
<td>AtSc 160</td>
<td>Computer Science I</td>
<td>(4)</td>
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<tr>
<td>AtSc 360</td>
<td>Dynamic Meteorology</td>
<td>Free Electives (2)</td>
</tr>
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#### Sophomore

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<tr>
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<tbody>
<tr>
<td>Phys 251/251L</td>
<td>University Physics I and Laboratory</td>
<td>(4)</td>
</tr>
<tr>
<td>Chem 121/121L</td>
<td>General Chemistry I and Laboratory</td>
<td>(4)</td>
</tr>
<tr>
<td>AtSc 240</td>
<td>Meteorological Instrumentation</td>
<td>(4)</td>
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<tr>
<td>AtSc 370</td>
<td>Computer Concepts in Meteorology</td>
<td>Atmospheric Science Elective (3)</td>
</tr>
<tr>
<td>Math 266</td>
<td>Elem. Differential Equations</td>
<td>Communications (3)</td>
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#### Junior

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<tbody>
<tr>
<td>Math 352 or 355</td>
<td>Advanced Engineering Mathematics I or II</td>
<td>(3)</td>
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<tr>
<td>AtSc 350</td>
<td>Atmospheric Thermodynamics</td>
<td>(3)</td>
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<tr>
<td>AtSc 353</td>
<td>Physical Meteorology</td>
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<tr>
<td>AtSc 360</td>
<td>Dynamic Meteorology</td>
<td>Social Sciences (3)</td>
</tr>
<tr>
<td>AtSc 419</td>
<td>Synoptic Meteorology I</td>
<td>Atmospheric Sciences Elective (3)</td>
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#### Senior

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<tr>
<td>AtSc 420</td>
<td>Synoptic Meteorology II</td>
<td>(3)</td>
</tr>
<tr>
<td>AtSc 492</td>
<td>Senior Project</td>
<td>(1)</td>
</tr>
<tr>
<td>AtSc 493</td>
<td>Meteorological Special Studies</td>
<td>(2)</td>
</tr>
<tr>
<td>AtSc 494</td>
<td>Senior Thesis</td>
<td>(3)</td>
</tr>
<tr>
<td>AtSc 497</td>
<td>Internship</td>
<td>(4)</td>
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All other Atmospheric Sciences courses will satisfy the minor excluding the following:

- AtSc 251: Advanced Weather Modification
- AtSc 331: High Altitude Meteorology
- AtSc 397: Cooperative Education
- AtSc 494: Special Studies
- AtSc 497: Internship

### Courses

110. Meteorology I Credit.
2 credits. Elements of the atmosphere with emphasis on those processes that affect the global atmospheric circulation. Includes laboratory. F/S

210. Meteorology II. 4 credits. Prerequisites: AtSc 110, Math 146 or Math 165.
The analysis and portrayal of synoptic weather conditions using computer and graphic analysis systems. Includes routine weather analysis. S

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. 3 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. F

250. Introduction to Weather Modification. 3 credits. Prerequisite: AtSc 110. A study of weather hazards, meteorological flight planning, aviation weather equipment and human factors in weather flying safety. F/S

251. Advanced Weather Modification. 3 credits. Prerequisites: AtSc 250.
Provides students exposure to the practical aspects of weather modification operations. Involves routine weather laboratory activities commonly found within the operational sector of meteorology. F

311. 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. F/S

340. Introduction to Radar Meteorology. 4 credits. Prerequisite: Phys 252. 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. F/S

350. Atmospheric Thermodynamics. 3 credits. Prerequisites: AtSc 110, Math 162, 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 electrification, and atmospheric radiation. F

360. Dynamic Meteorology. 4 credits. Prerequisites: AtSc 350. 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. F/S

370. Computer Concepts in Meteorology. 3 credits. Prerequisite: An approved computer language course. Examines the need and use of computers in meteorology. Topics include the application of various computer concepts, such as numerical solution of linear differential equations and numerical integration, and numerical modeling techniques. S

397. Cooperative Education. 1-8 credits, may be repeated to a total of 12 credits with a maximum of 4 credits toward major electives. Prerequisites: AtSc 250, and overall GPA of at least 2.5, and approval of the Coordinator of Atmospheric Sciences cooperative education. The student will receive credit for on-the-job compensated work experience in various areas of meteorology available within the government, university or private sectors. S/U grading only. F,S,SS

419. Synoptic Meteorology I. 4 credits. Prerequisite: AtSc 360. Atmospheric processes important to large-scale flow. Geostrophic and gradient winds, thermal wind, solenoidal winds. Advection, vorticity, divergence, and quasi-geostrophic flow. Includes laboratory. F

420. Synoptic Meteorology II. 3 credits. Prerequisites: AtSc 419 and Math 352 or 353 or a pre- or corequisite. Application of quasi-geostrophic theory to the synoptic atmosphere including analysis and forecasting. Introduction to numerical weather prediction. S

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**MINOR IN ATMOSPHERIC SCIENCES**

Requires 20 credits including:

- AtSc 110: Meteorology I
- AtSc 210: Meteorology II
- AtSc 310: Introduction to Weather Forecasting
AVIATION DEPARTMENTAL POLICIES

Flight costs are not included in 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. Deposits 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.

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 the Federal Aviation Administration Part 141, Appendix B—paragraph 3, and Appendix D—paragraph 3. Failure to meet these attendance requirements will disqualify the student for FAA pilot certification. The following courses are Federal Aviation Regulation, Part 141, approved: Avit 102; 221; 222; 323; 324; 324; 412; and 415.

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 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 with the aviation major that they are pursuing at the University of North Dakota.

All Aviation transfer courses, 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, F.O. Box 9007, Grand Forks, North Dakota 58202-9007. E-mail: flyund@aero.und.nodak.edu.

FLIGHT POLICIES

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.

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 I 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 are encouraged to make plans to obtain their medical certificates long before they will begin training. This will ensure that any problems can be addressed before the student enrolls in a flight training course.

DRUG POLICY

The John D. Odegard School of Aerospace Sciences has adopted a “no tolerance” policy regarding the use of drugs and alcohol, reflecting a commitment to the highest safety standards. In accord with this policy, 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.

Aviation

(Avit)

Lovelace (Chair), Backstrom, Bridewell, Foltz, Jensen, Kenville, Lindseth, Mach, Marshall, Robertson, Schumacher, Skramslad, Smith, Trapnell, and Watson

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 Technology. The Business degree is fully accredited by the American Assembly of Collegiate Schools of Business (AACSB). The Commercial Aviation degree is fully accredited by the Council on Aviation Accreditation (CAA).

A Rotorcraft-Helicopter option is available in Aviation degree programs. Students interested in this option must contact their advisors.

A Cooperative Education program is offered by the Department of Aviation, which encourages students to obtain-on-the-job experience while continuing their academic education. Semester-long cooperative internships are available offering opportunities at major airports, general aviation manufacturers, airlines, and weather modification research operational contractors. Students can apply for 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 JDOSSA. In addition, representatives of aviation industries, the Federal Aviation Administration, Transport Canada and airlines come to UND for career fairs and interviewing sessions.

All students, regardless of major, are required to have a minimum Grade Point Average (GPA), cumulative and institutional, of 2.50 in order to enroll in all 200-level and above aviation courses. Students enrolling in Aviation 102 (Introduction to Aviation) must have a minimum ACT score of 22 or have at least 12 credits of course work with a minimum GPA of 2.50. All students who enroll in aviation courses who fall below the minimum GPA required are subject to withdrawal from the courses by the Aviation Department.

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. F,S

450. Introduction to Cloud Physics Meteorology. 4 credits. Prerequisite: AtSc 350 and 355. A study of the physics of clouds with emphasis on micro-physical processes involved in cloud formation, precipitation production, and dissipation. Includes Laboratory. 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

494. 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. F,S,SS

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
COURSE FEES
Aviation Department Laptop Computer Fee:
A program fee of $500 per semester ($1000 per academic year) will be charged to all Aviation students.
A program fee of $125 will be charged to all Aviation students for the use of the Altitude Chamber. Aviation 309
A program fee of $450 per course for three courses will be charged to all Air Traffic Control majors. Aviation 463, 464 and 465.

FINANCIAL AID INFORMATION
Students are encouraged to explore all financial aid options as outlined on page 8. In addition to these forms of aid, the Aviation Department has a separate scholarship fund for its students. All aviation students, including freshmen and new transfers, are eligible to apply. Forms are available at the beginning of the fall semester from the Aviation Department. Applications for scholarships are due early each 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 for a particular curriculum. If the student desires to obtain additional ratings, he/she is responsible for the expenses incurred.

PROGRAM DESCRIPTIONS
The Aviation Management curriculum is offered to those students whose career objectives are toward the management and operation of the flight-related activities of the aviation industry. Emphasis is placed on the relationship of modern management practices to airline, airport and general aviation management. 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 and related to the ground activities of the aviation industry. All aspects of general aviation, air carrier, and the total aviation industry will be studied in-depth with sufficient flexibility in courses to allow the student to concentrate in a particular area of the industry such as general aviation operations, airline management, airport administration, or corporate aviation management. A Private Pilot Certificate is required.

The Commercial Aviation curriculum is designed for a variety of flight-related careers. Commercial Aviation combines a solid background in aviation courses with a Certified Flight Instructor Certificate, with appropriate ratings, to give the student the education necessary for entry-level positions in the aviation industry. A commercial pilot certificate with instrument and multi-engine ratings, plus a Certified Flight Instructor Certificate with airplane and instrument rating are required.

The Flight Education curriculum is designed for students interested in aviation education as a profession. This program combines a Certified Flight Instructor Certificate, with vocational education courses to provide the student with a solid background in aviation education. Students interested in teaching at the college level are encouraged to go on to graduate work. A Commercial Pilot Certificate with instrument and multi-engine ratings, plus a Certified Flight Instructor Certificate with instrument and multi-engine ratings are required.

The Air Traffic Control curriculum is designed to place students directly into the exciting career field of air traffic control. This program also requires a second field of study. A Private Pilot Certificate is required.

The Aviation Systems Management curriculum is designed to be the latter 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 support services to complete a bachelor’s degree with an emphasis on management. A Private Pilot Certificate is required.

Note: The Aviation Faculty highly recommends 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 AIRPORT MANAGEMENT
Required: 125 credits (36 or 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 section)
III. The following curriculum:

PRE-BUSINESS CURRICULUM
Acc 200  Elements of Accounting I.  (3)
Acc 201  Elements of Accounting II.  (3)
AtSc 110  Meteorology I (Lab Science)  (4)
Comm 110  Fundamentals of Public Speaking  (3)
Econ 201  Principles of Microeconomics  (3)
Econ 210  Intro to Business and Economic Statistics  (3)
Engl 110  College Composition I  (3)
Engl 120  College Composition II  (3)
Engl 125  Technical and Business Writing  (3)
Geol 103  Intro to Environmental Issues  (3)
Isys 217  Fundamentals of Management Information Systems  (4)
Isys 305  End User Applications  (3)
Lang 101  Foreign Language  (4)
Lang 102  Foreign Language  (4)
Math 104  Finite Mathematics  (3)
Math 146  Applied Calculus I  (3)
Pols 115  American Government I  (3)
Arts and Humanities (other than Language) Electives  (1)

One of the following:
Art 110  Cultural Anthropology  (3)
Pscy 111  Introduction to Psychology  (3)
Soc 110  Introduction to Sociology  (3)

AVIATION COURSES
Avit 100  Aviation Orientation  (1)
Avit 102  Introduction to Aviation  (5)
Avit 103  Introduction to Air Traffic Control  (2)
Avit 110  Human Factors  (2)
Avit 202  Air Transportation  (3)
Avit 208  Aviation Safety  (3)
Avit 402  Airport Planning and Administration  (3)
Avit 403  Aerospace Law  (3)
Avit 442  Airport Operations and Administration  (3)

One of the following:
Avit 405  Airline Operations and Management  (3)
Avit 407  General Aviation Operations and Management  (5)

ADVANCED BUSINESS COURSES
Acc 315  Business in the Legal Environment  (3)
Econ 303  Money and Banking  (3)
Econ 324  Public Finance  (3)
Fin 310  Principles of Finance  (3)
Isys 305  End-user Applications  (3)
Mgmt 300  Principles of Management  (3)
Mgmt 301  Production Management  (3)
Mgmt 302  Human Resource Management  (3)
Mgmt 310  Organizational Behavior  (3)
Mgmt 475  Strategic Management  (3)
Mrkt 305  Marketing Foundations  (3)
Pols 404  Urban Politics and Administration  (3)

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 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 section).
III. The following curriculum:

PRE-BUSINESS CURRICULUM
Acc 200  Elements of Accounting I  (3)
Acc 201  Elements of Accounting II  (3)
AtSc 110  Meteorology I (Lab Science)  (4)
Comm 110  Fundamentals of Public Speaking  (3)
Csci 120  Computer Programming I  (3)
Econ 201  Principles of Microeconomics  (3)
Econ 202  Principles of Macroeconomics  (3)
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, dispatch, simulator repair or other aviation technical support program. Students seeking a professional in Aviation Maintenance are required to have an 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 an 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. Center for Aerospace Sciences Requirements, see College listing.
III. The following curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avit 102</td>
<td>Introduction to Aviation</td>
<td>3</td>
</tr>
<tr>
<td>Avit 106</td>
<td>Introduction to Air Traffic Control</td>
<td>2</td>
</tr>
<tr>
<td>Avit 212</td>
<td>Basic Attitude Instrument Flying</td>
<td>3</td>
</tr>
<tr>
<td>Avit 222</td>
<td>IFR Regulations and Procedures</td>
<td>3</td>
</tr>
<tr>
<td>Avit 250</td>
<td>Human Factors</td>
<td>2</td>
</tr>
<tr>
<td>Avit 302</td>
<td>Air Transportation</td>
<td>3</td>
</tr>
<tr>
<td>Avit 308</td>
<td>Aviation Safety</td>
<td>3</td>
</tr>
<tr>
<td>Avit 323</td>
<td>Aerodynamics—Airplanes</td>
<td>3</td>
</tr>
<tr>
<td>Avit 324</td>
<td>Aircraft Systems</td>
<td>3</td>
</tr>
<tr>
<td>Avit 325</td>
<td>Multi-Engine Systems and Procedures</td>
<td>2</td>
</tr>
<tr>
<td>Avit 403</td>
<td>Aerospace Law</td>
<td>3</td>
</tr>
<tr>
<td>Avit 402</td>
<td>Airport Planning and Administration</td>
<td>3</td>
</tr>
<tr>
<td>Avit 405</td>
<td>Airline Operations and Management</td>
<td>3</td>
</tr>
<tr>
<td>Avit 407</td>
<td>General Aviation Operations and Management</td>
<td>3</td>
</tr>
<tr>
<td>Avit 408</td>
<td>Airport Planning and Administration</td>
<td>3</td>
</tr>
<tr>
<td>Avit 409</td>
<td>Airline Operations and Management</td>
<td>3</td>
</tr>
<tr>
<td>Avit 414</td>
<td>General Aviation Operations and Management</td>
<td>3</td>
</tr>
</tbody>
</table>

ADVANCED BUSINESS COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 315</td>
<td>Business in the Legal Environment</td>
<td>3</td>
</tr>
<tr>
<td>Econ 303</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>Fin 310</td>
<td>Principles of Finance</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 302</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 303</td>
<td>Production Management</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 302</td>
<td>Human Resource 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>
</tbody>
</table>

Plus electives to total 125 credits

B.S. IN AERONAUTICS WITH A MAJOR IN COMMERCIAL AVIATION

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

I. General Education Requirements (see University GER listing).
II. Center for Aerospace Sciences Requirements, see College listing.
III. The following curriculum:

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Avit 102</td>
<td>Introduction to Aviation</td>
<td>3</td>
</tr>
<tr>
<td>Avit 106</td>
<td>Introduction to Air Traffic Control</td>
<td>2</td>
</tr>
<tr>
<td>Avit 250</td>
<td>Human Factors</td>
<td>2</td>
</tr>
<tr>
<td>Avit 260</td>
<td>ATC Tower Operations</td>
<td>4</td>
</tr>
<tr>
<td>Avit 261</td>
<td>Advanced Air Traffic Control—Radar Operations</td>
<td>4</td>
</tr>
<tr>
<td>Avit 302</td>
<td>Air Transportation</td>
<td>3</td>
</tr>
<tr>
<td>Avit 308</td>
<td>Aviation Safety</td>
<td>3</td>
</tr>
<tr>
<td>Avit 362</td>
<td>ATC Advanced Tower Operations</td>
<td>4</td>
</tr>
<tr>
<td>Avit 363</td>
<td>Advanced Air Traffic Control—Radar Operations</td>
<td>4</td>
</tr>
<tr>
<td>Avit 402</td>
<td>Airport Planning and Administration</td>
<td>3</td>
</tr>
</tbody>
</table>
### 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. Center for Aerospace Sciences Requirements, see College listing.

III. The following curriculum:

#### GENERAL EDUCATION COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AtSc 110</td>
<td>Meteorology I</td>
<td>(4)</td>
</tr>
<tr>
<td>Comm 100</td>
<td>Fundamentals of Public Speaking</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
<td>(3)</td>
</tr>
<tr>
<td>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>Math 146</td>
<td>Applied Calculus I</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 150/150L</td>
<td>Physics for Aerospace Sciences</td>
<td>(5)</td>
</tr>
</tbody>
</table>

#### OTHER REQUIREMENTS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>
<tr>
<td>Avit 103</td>
<td>Introduction to Air Traffic Control</td>
<td>(2)</td>
</tr>
<tr>
<td>Avit 221</td>
<td>Basic Attitude Instrument Flying</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 222</td>
<td>IFR Regulations and Procedures</td>
<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 308</td>
<td>Aviation Safety</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 399</td>
<td>Flight Physiology</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 323</td>
<td>Aerodynamics–Airplanes</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 324</td>
<td>Aircraft Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 325</td>
<td>Multi-Engine Systems and Procedures</td>
<td>(2)</td>
</tr>
<tr>
<td>Avit 327</td>
<td>Gas Turbine Engines</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 403</td>
<td>Aerospace Law</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 409</td>
<td>Advanced Aircraft Operations</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 414</td>
<td>Certified Flight Instructor</td>
<td>(5)</td>
</tr>
<tr>
<td>Avit 415</td>
<td>Instrument Flight Instructor</td>
<td>(4)</td>
</tr>
<tr>
<td>Avit 421</td>
<td>Advanced Aerodynamics</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 428</td>
<td>Transport Category Aircraft Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 430</td>
<td>Crew Resource Management</td>
<td>(2)</td>
</tr>
</tbody>
</table>

Two of the following:

- Avit 402 Airplane Planning and Administration (3)
- Avit 405 Airline Operations and Management (3)
- Avit 407 General Aviation Operations and Management (3)

#### MINORS IN AVIATION

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)
- Avit 231 Aviation Meteorology I (4)
- Avit 102 Introduction to Aviation (5)
- Avit 221 Basic Attitude Instrument Flying (3)
- Avit 222 IFR Regulations and Procedures (3)
- Avit 308 Aviation Safety (3)
- Avit 323 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 102 Introduction to Aviation (5)
- Avit 221 Basic Attitude Instrument Flying (3)
- Avit 308 Aviation Safety (3)
- Avit 402 Airline Planning and Administration (3)
- Avit 403 Airline Operations and Management (3)
- Avit 405 Airline Operations and Management (3)
- OR
- Avit 407 General Aviation Operations and Management (3)

### COURSES

All 400 level courses are restricted to junior 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.

102. **Introduction to Aviation.** 5 credits. Co-requisite: 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 safety. The student must complete the appropriate flight lessons to satisfactorily complete the course. F, S, SS.

103. **Introduction to Air Traffic Control.** 2 credits. Major elements of this course include the development of ATC personnel and technology, the physiological and psychological requirements of an ATC career, the components and functions of the National Airspace system, the structure and functions of both Terminal and EnRoute ATC facilities and the impact of major technological changes anticipated in the future. The students will be offered a realistic look at Air Traffic Control by allowing them the opportunity to simulate the role of an Air Traffic Controller. F, S, SS.

104. **Aviation History.** 3 credits. Topics covered include history from its very beginning through the space shuttle launches of today. On Demand

142. **Introduction to Aviation–Helicopter.** 5 credits. Co-requisite: 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 helicopter aerodynamics, helicopter systems, FAA regulations, U.S. Airspace System, weight and balance, helicopter performance, aviation weather, flight publications, radio navigation, cross-country planning and navigation, basic flight physiology, and flight safety. The student must complete the appropriate flight lessons in the Private Helicopter course to satisfactorily complete the course. F

183. **Glider Certification.** 1 credit. Prerequisite: Avit 102. Su grading only.

221. **Basic Attitude Instrument Flying.** 3 credits. Prerequisite: Avit 102. This course will include an in-depth study of pitot/static and gyro instruments and basic attitude instrument flying. In addition, the operation, interpretation and practical use of VOR, ADF, DME, GPS, RNAV, RMI, HSI, and Integrated Flight Control systems will be studied. The student must complete the appropriate flight lessons to satisfactorily complete the course. F, S, SS.

222. **IFR Regulations and Procedures.** 3 credits. Prerequisite: Avit 221. 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. F, S, SS.

**AVIATION COURSES**

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<td>Avit 222</td>
<td>IFR Regulations and Procedures</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 308</td>
<td>Aviation Safety</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 323</td>
<td>Aerodynamics–Airplanes</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 324</td>
<td>Aircraft Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 325</td>
<td>Multi-Engine Systems and Procedures</td>
<td>(2)</td>
</tr>
<tr>
<td>Avit 403</td>
<td>Aerospace Law</td>
<td>(3)</td>
</tr>
<tr>
<td>Avit 405</td>
<td>Airline Operations and Management</td>
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</tr>
<tr>
<td>Avit 407</td>
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<td>(3)</td>
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<td>Avit 414</td>
<td>Certified Flight Instructor</td>
<td>(5)</td>
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<td>Avit 415</td>
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<td>(4)</td>
</tr>
<tr>
<td>Avit 416</td>
<td>Multi-engine Flight Instructor</td>
<td>(2)</td>
</tr>
<tr>
<td>Avit 490</td>
<td>Materials and Methods in Teaching Aviation</td>
<td>(3)</td>
</tr>
</tbody>
</table>

**OTHER REQUIREMENTS**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AtSc 231</td>
<td>Aviation Meteorology</td>
<td>(4)</td>
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<tr>
<td>ISBE 303</td>
<td>Methods of Teaching Business Education</td>
<td>(2-3)</td>
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<tr>
<td>ISBE 320</td>
<td>Business Communication</td>
<td>(3)</td>
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<tr>
<td>ISBE 402</td>
<td>Curriculum Development in Voc Ed</td>
<td>(3)</td>
</tr>
<tr>
<td>ISBE 403</td>
<td>Professional Training Techniques</td>
<td>(3)</td>
</tr>
<tr>
<td>ISBE 444</td>
<td>Philosophy of Vocational Education</td>
<td>(3)</td>
</tr>
<tr>
<td>Psy 213</td>
<td>Educational Psychology</td>
<td>(3)</td>
</tr>
</tbody>
</table>
243. Aircraft Systems-Helicopter. 3 credits. Pre- or corequisite: Avit 142. Provides a study of turbine powered helicopters. Theory and application of turbine engines. Drive trains, fuel, oil, hydraulic, and electrical systems will be studied. The student will be able to design the appropriate flight lessons in the Commercial Helicopter Course to satisfactorily complete the course. On Demand.

244. Basic Attitude Instruments and Navigation-Helicopter. 3 credits. Pre- or corequisite: Avit 112. This course will teach the appropriate flight lessons in the Instrument Helicopter Course to satisfactorily complete the course. On Demand.

250. Human Factors. 2 credits. This course introduces the student to the human element of the “human-machine interface” in aviation. The course is designed to provide the student with a basic understanding of the human factors concepts including psychological and basic physiological limitations of humans operating in complex environments and design elements that allow for optimizing human machine interaction. F,S

260. ATC: Tower Operations. 4 credits. Prerequisite: Avit 103. Provides an orientation to basic fundamental clearance delivery (CD) and ground control (GC) operations and procedures. Tower interaction with other ATC and non-ATC agencies is also part of this course. To complete this course, students must demonstrate their basic knowledge and skill set in the function of control tower operations through written and performance examinations. F,S

261. ATC: Radar Operations I. 4 credits. Prerequisite: Avit 362. This course provides students with basic radar training, separation requirements, procedures and knowledge of terminal radar operations. Student evaluations are based on demonstrated application of acquired controller skills utilizing ATC simulation. Exercises progress in difficulty. To complete this course, students must successfully complete an advanced radar simulation exercise without assistance. F,S

299. Topics in Aviation. (CNN) 1-3 credits. Selected topics in aviation which allow the student to study a specialized subject. Repeatable to a maximum of 6 credits. F, S

301. Avionics for Aviators. 3 credits. Prerequisite: Avit 102. Theory of operation of various types of avionics equipment. The course starts with a review of basic electricity, then applies this basic theory to aircraft electrical systems. The course includes basic radio wave propagation, antenna/telemetry, transmitter/receiver theory, and theory and limitations of basic navigation control systems and traffic control systems. A term paper is required. Students are encouraged to learn Morse Code for extra credit. S, S

302. Air Transportation. 3 credits. Corequisites: sophomore or higher. Provides a broad understanding of all aspects of the air transportation industry. The scope of course material includes knowledge of state and federal regulations and the basis for their establishment. Requirements of the past, present and future with respect to aircraft and engine design, airports and supporting facilities are reviewed and evaluated. Students are introduced to the practical economics of airline operations and maintenance and the factors which affect a profit or loss situation. F, S

308. Aviation Safety. 3 credits. Prerequisite: Avit 102. This course provides the student with a detailed introduction into aspects of aviation safety risk management, and the associated components of pilot psychology, human factors, and accident trends, factors and analysis. F, S

309. Flight Physiology. 3 credits. This course provides an in-depth study of aeromedical factors for pilots. The course covers the recognition, treatment, and prevention of problems associated with exposure to reduced atmospheric pressure, sensory (visual and vestibular) problems in flight, environmental stressors, and health and wellness factors that can impact human performance in flight. The course includes “flights” in an altitude in an altitude chamber and exposure to a spatial disorientation demonstration. F, S

323. Aerodynamics—Airplanes. 3 credits. Prerequisite: Phys 150 and 150L, Avit 222. Corequisite: Avit 324. This course will provide the student a study of the physical principles of airplane aerodynamics, thereby fostering an appreciation of the factors affecting aircraft performance, stability and control, and special flight conditions often experienced by commercial pilots of fixed-wing aircraft. F, S, SS

324. Aircraft Systems. 3 credits. Prerequisite: Avit 222, corequisite: Avit 323. This course provides an in-depth study of reciprocating engine, propeller, electrical, environmental, hydraulic, pneumatic, fuel, ignition, lubrication, and pressurization systems. F, S

325. Multi-Engine Systems and Procedures. 2 credits. Prerequisites: Avit 324. This course covers the operations necessary to operate light twin-engine aircraft. Normal and abnormal procedures are included along with a discussion of the systems and aerodynamics normally associated with these aircraft. Regulations for commercial pilots are included. The student must complete the appropriate flight lessons to satisfactorily complete the course. On Demand.

327. Gas Turbine Engines. 3 credits. Prerequisite: Avit 325. 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

346. Aerodynamics and Performance — Helicopter. 3 credits. Prerequisites: Avit 142, Phys 150/150L. This course will provide study of helicopter aerodynamics, performance and stability. Theory and the function of rotor and main rotor system. The student must complete the appropriate flight lessons in the Commercial Helicopter Course to satisfactorily complete the course. On Demand.

348. Commercial Certification — Helicopter Additional Rating. 3 credits. Prerequisite: Commercial Pilot Certificate. This course provides the dual flight instruction and solo practice necessary to obtain a Commercial Pilot Certificate with a Rotorcraft-Helicopter Rating. The course includes ground instruction in helicopter flight procedures, flight attitudes, control systems, auto rotation, vertical flight, and off-airport operations. The student must complete the appropriate flight lessons to satisfactorily complete the course. On Demand.

349. Instrument Certification — Helicopter Additional Rating. 1 credit. Prerequisite: Avit 142. At the completion of this course, helicopter students will have completed all FAA requirements for a Helicopter Instrument Rating. A minimum of a Private Pilot Certification with an Instrument Rating is required to enroll in this course: S-U grading only. On Demand.

362. ATC: Advanced Tower Operations. 4 credits. Builds on the previous two courses adding Terminal Radar Approach Control in the Tower (TRACAB) operations. Training includes tower radar operations, separation requirements, procedures, and knowledge of radar, nonradar, and tower operations. F,S

363. ATC: Radar Operations II. 4 credits. Prerequisite: Avit 261. This course provides students with advanced radar training, separation requirements, procedures and knowledge of terminal radar operations. Student evaluations are based on demonstrated application of acquired controller skills utilizing ATC simulation. Exercises progress in difficulty. To complete this course, students must successfully complete an advanced radar simulation exercise without assistance. F,S

385. Seaplane Certification. 1 credit. Prerequisite: Avit 354 or consent of instructor. The seaplane certification course includes all the necessary classroom and flight instruction for the student to acquire the skill, knowledge, and experience for obtaining a seaplane rating on helicopters. F,S

386. Conventional Aircraft Operations. 1 credit. Prerequisite: Avit 262. Provides the necessary ground school and dual flight instruction for endorsement for operation of tailwheel-type airplanes. Allows the student to acquire the knowledge and skills necessary for operation of the tailwheel aircraft on the ground and in flight. S-U grading only. F, S, SS

389. Introduction to Aerobatic Flight. 1 credit. Prerequisite: Avit 102. To introduce, analyze and fly some of the more advanced flight maneuvers defined as aerobatics. Basic aerobatic maneuvers will all be flown during the course. Maneuvers include, but not be limited to, full flap water takeoffs, porpoising and skipping, water emergency takeoffs and landings, taxiing, sailing and docking, glassy water operations, cross-wind and downwind landings, and the general care and operation of a seaplane. S-U grading only. F, S, SS

391. Cooperative Education. (CCN) 1-4 credits. S-U grading only. Prerequisite: Acceptance into a co-op position with cooperating industry and approval by Aviation Department. A practical work experience with an employer closely associated with the student’s academic area. Arranged by mutual agreement between student, aviation department, and employer. A maximum of four cooperative education credits may be applied toward the total credits needed to complete degree requirements. Co-op credits may not be substituted for any required course within the student’s major. F, S, SS

399. Special Aerospace Topics. (CCN) 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 and its importance in achieving a successful airport operation. Course content includes a study of the duties and responsibilities of the airport manager with a special emphasis on the Federal Air Regulations governing the operation and administration of commercial service airports within the United States. F, S

403. Aerospace Law. 3 credits. Prerequisite: Avit 302 and junior standing. Designed to cover the scope of all regulations concerning aviation (traffic rules, agencies, operation, aircraft and people) in accordance with federal, state and local agencies. F, S

405. Airline Operations and Management. 3 credits. Prerequisite: Avit 302. Designed to cover the complex area of operational techniques and problems confronting the airlines today. Officials from airlines will conduct discussions on the real and immediate problems in an airlines operation. Market research and passenger trends, route feasibility studies, and criteria for transport aircraft, will be stressed. F, S

407. General Aviation Operations and Management. 3 credits. Prerequisite: Avit 302. Aspects of the operation and management of corporate flight departments, fixed-base operations and air cargo operations will be discussed. Important regulations including FAR parts 91, 135 and regulations pertaining to transport of hazardous materials are studied. Aircraft and equipment will be studied. F, S

409. Advanced Aircraft Operations. 3 credits. Prerequisites: Avit 421, 428. The topics of study include high speed and high altitude aerodynamics, physiological aspects of high altitude flight, considerations associated with operations near high speed buffet boundaries, effects of turbulence on high speed aircraft, the effects of maneuvering load factors, along with the general study of the applied systems management. F, S

411. International and Long Range Flight. 3 credits. Prerequisites: Avit 325 and Math 146. This course provides and understanding of global charting systems, great circle route and waypoint plotting. Problems and methods of international flight and modern systems of long range navigation are considered as well as methods and systems of computing, communicating and displaying navigation information. F, S

414. CFII Certification. 5 credits. Prerequisite: Avit 325. Provides the student with a detailed study of the responsibilities, capabilities and teaching concerns of the first flight instructor. The course is divided into two major sections: fundamentals of teaching and learning, including effective teaching methods, learning process, consideration of flight training
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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 experience. The student must complete the associated flight lessons in the CFI Flight Course to satisfactorily complete the course. F, S, SS

415. Instrument 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. Additional study of instrument flight, ATC systems, charts, publications and rules of the IFR environment as they pertain to teaching will be covered. The course will provide 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 325 and 414. 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 airplanes. The student must complete the associated flight lessons in the Multi-engine Airplane CFI course to satisfactorily complete the course. 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 provides a study of the terminology and aerodynamics fundamentals associated with transonic and supersonic flight. F, S

428. Transport Category Aircraft Systems. 4 credits. Prerequisite: Avit 325 or consent of the instructor. This course will provide an indepth study of the complex systems of today’s transport jet aircraft. It provides initial study of heavy aircraft auxiliary power unit, fire, pneumatic, environmental, pressurization, fuel, and electrical systems. Both normal and abnormal system operations will be studied. F, S

429. Turboprop Operations. 4 credits. Prerequisite: Avit 325 or consent of the instructor. This course will provide an introduction to the study of turboprop aircraft systems. The type of aircraft studied may vary from semester to semester. F, S

430. Crew Resource Management. 2 credits. Prerequisite: Avit 250 and 325. This course will provide an in-depth study of Crew Resource Management which involves having a complete understanding of the flight deck environment and the proper utilization of all resources available to an aviator. This course gives the student a thorough indoctrination to CRM, including areas of leadership communications and management as they apply to the modern air transport pilot. F, S

442. Airport Operations and Administration. 3 credits. Prerequisite: Avit 402. This course is the second of a two course curriculum in airport administration. It is an advanced course emphasizing the further development of the skills and understanding of the operation and management of commercial service airports of all sizes. The content focuses upon the practical application of airport manager skills and includes educational tours of operating airports. The program stresses the airport manager’s role in relations with tenants, public officials, and patrons through the honing of individual writing and public speaking skills. S

464. ATC: En Route Non-Radar Operations. 4 credits. Prerequisite: Avit 260. This course is a very advanced radar and non-radar procedure course and is a follow-up to Avit 363 or Avit 465. Comprehensive knowledge of ATC procedures, airspace utility, and separation standards is stressed with a focus on the enroute ATC environment. Students complete a series of increasingly difficult ATC simulation exercises. Advanced subject material includes: non-radar concepts, advanced non-radar enroute separation techniques and unusual situations. Emphasis is applied toward developing advanced spatial relationship skills. To complete this course, students must successfully perform an advanced non-radar and radar simulation exercise without assistance. F, S

465. ATC: Radar and Tower Operations. 4 credits. Prerequisite: Avit 464. This course will bring together all knowledge acquired in previous ATC courses. Completing realistic, non-radar exercise scenarios, students will be required to demonstrate the ATC performance skills with an emphasis on split sector operations. F, S

481. Airline Transport Pilot Certification Lab. 2 credits. Prerequisites: Avit 308 and 325. Co-requisite: Avit 410. Provides a comprehensive background of flight experience in two engine airplanes to meet the proficiency requirements of the FAA Airline Transport Pilot oral and 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, (CCN) 3 credits. Prerequisite: Avit 414. This course will acquaint the student with resources and software used in classroom teaching specific to aviation. Topics covered include use of presentation software, writing a syllabus, composing lesson plans, delivering a lecture/presentation, and writing tests. Discussion of teaching methods and critiques of peers will also be included. On Demand.

497. Aviation Internship, (CCN) 1-4 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 management, both the manufacturer and fixed-base operator level and within the weather modification industry. The weather modification internship will be available only with the necessary federal funding or contractor support. Maximum of 4 credits will be allowed toward graduation. F, S, SS

499. Readings in Aviation, (CCN) 1-3 credits. Prerequisite: senior standing. Repeatable 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 to subjects including airport traffic count, student flight activities, airport management problems, and statistical reports. F, S

Banking and Financial Economics
(See Economics listing)

Biochemistry and Molecular Biology
(BiCh)

D. Lambeth (Interim Chair), Detke, Foster, Milavetz, L. Ray, Shabb, Sukalski, and Vaughan

Courses

301. Biochemistry Lecture. 3 credits. Three lectures per week. Prerequisite: Organic Chemistry (Chemistry 212, or Chemistry 350, or equivalent). Topics include enzymology, bioenergetics, metabolism and its regulation, nutrition, cell structure and function, synthesis, structure and function of macromolecules; gene expression.

303. Biochemistry Laboratory. 3 credits. Prerequisites: Organic Chemistry (Chemistry 212, or 305, or 351, or equivalent and Path 336). The laboratory (associated with Biochemistry 301) consists primarily of chemical analysis of biological materials. Fundamental clinical laboratory procedures utilizing various techniques and instrumentation are carried out.

Biology
(Biol)

J. La Duke (Chair), Austin, Carmichael, Crawford, Fivizzani, Gerber, Kelsch, Lang, Meberg, Newman, Potvin, Pyle, Schlosser, Sheridan, Sweltzer, and Vaughan

The Department of Biology offers concentrated study in Biology and in Fisheries and Wildlife Biology. The objective of these majors is to provide students with a broad knowledge of modern biology through training in each of the major areas of biological science: ecologic, genetic, molecular, morphologic and systematic biology. Specific department requirements for majors and minors are listed below.

FACILITIES

The Department of Biology is housed in Starcher Hall, completed in 1981. In addition to classrooms, two computer laboratories and other specialized teaching laboratories, the building houses an herbarium, three greenhouses, environmental chambers, animal rooms for terrestrial and aquatic organisms, observation rooms, vertebrate and invertebrate museums, a darkroom, and iso- tope and tissue culture facilities. The Department also maintains two natural areas (virgin prairie and wooded stream valley) 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.
Biology

B.S. WITH MAJOR IN BIOLOGY

This program is designed for students interested in a broad general background and studies interested in a number of biological sub-disciplines, including: Ecology, Conservation Biology, Behavior, Evolution, Fisheries Biology, Wildlife Biology, Genetics, Morphology, Physiology, Systematics, Cell Biology, and Molecular Biology. Students must consult with their adviser 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).

II. 40 major hours including:
- 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)

III. Biology Electives: (20)

Students enrolling in other 300 or 400 level biology courses are expected to have mastered material from the courses listed in section II above; therefore, we strongly advise the prior completion of all courses from section II.

All other 300 or 400 biology courses will count toward the 40 hour major. (See below for limitations on 494 — Directed Studies, 492 — Research, and 489 — Senior Honors).

No more than a combined total of 10 credits from 494 — Directed Studies, 492 — Research, and 489 — Senior Honors will count toward the 40 hour major.

No more than one biology course intended for non-majors (all UND 200-level biology courses) will count toward the 40 hour major.

Up to two life-sciences related courses from other departments at UND may be counted toward the 40 hour major.

At least four upper-division biology courses with laboratories must be included in the 40 hour major (qualifying classes marked with asterisk*).

IV. Required in other Departments: (35-42 hours)
- Phys 211 & 212 . . . . College Physics I & II ............... (8)
- Level II proficiency in a foreign language ............... (8)
- Chem 121/121L . . . . General Chemistry I/Lab ............. (4)
- Chem 122/122L . . . . General Chemistry II/Lab ............. (4)
- Math 165/165L . . . . Calculus I/Lab ..................... (4)

O R

Chem 341 & 342 . . . . Organic Chemistry ................. (10)

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.

B.S. WITH MAJOR IN BIOLOGY (Pre-Health Sciences Emphasis)

This program is designed for students interested in medicine or in allied medical fields such as dentistry, veterinary medicine, medical laboratory research, etc. Students must consult with their adviser 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).

II. 40 major hours including:

A. Basic requirements:
- Biol 150 & 151 . . . . General Biology I & II .......... (6)
- Biol 150L & 151L . . . . General Biology I & II Lab ...... (2)
- Biol 312 . . . . . . Evolution .................. (3)
- Biol 315 . . . . . . Genetics .................... (3)
- Biol 332 . . . . . . Ecology .................... (3)
- Biol 341 . . . . . . Cell Biology .................. (3)

Students enrolling in other 300 or 400 level biology courses are expected to have mastered material from the courses listed in section A above; therefore, we strongly advise the prior completion of all courses from section A.

B. Advanced requirements:

8 hours from:
- Biol 341L . . . . . . . . . Cell Biology Laboratory .......... (1)
- Biol 367 . . . . . . . . . Cytology ..................... (3)
- Biol 369 . . . . . . . . . Histology .................... (3)
- Biol 369L . . . . . . . . . Histology Laboratory .......... (1)
- Biol 370 . . . . . . . . . Vertebrate Zoology ............. (3)
- Biol 371 . . . . . . . . . Anatomy and Adaptations Laboratory .. (2)
- Biol 378 . . . . . . . . . Developmental Biology .......... (3)
- Biol 442 . . . . . . . . . . Physiology of Organs and Systems . (3)
- Biol 442L . . . . . . . . . . Physiology of Organs and Systems . (1)

C. Biology electives: (12)

See your adviser for appropriate and up-to-date course recommendations.

All other 300 or 400 level biology courses will count toward the 40 hour major. (See below for limitations on 494 — Directed Studies, 492 — Research, and 489 — Senior Honors)

No more than a combined total of 10 credits from 494 — Directed Studies, 492 — Research, and 489 — Senior Honors will count toward the 40 hour major.

No more than one biology course intended for non-majors (all UND 200-level biology courses) will count toward the 40 hour major.

Up to two life-sciences related courses from other departments at UND may be counted toward the 40 hour major.

At least four upper-division biology courses with laboratories must be included in the 40 hour major (qualifying classes marked with asterisk*).

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 General Emphasis Option for the B.S. in Biology and include the following three courses as biology electives:

- Biol 312 . . . . . . . . . Evolution .................. (2)
- Biol 336 . . . . . . . . . Systematic Botany ............... (4)
- Biol 340 . . . . . . . . . General Microbiology ............ (1)

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 BioCh Biochemistry Lecture (3) option. Level II language proficiency is not required of students who complete the Teaching and Learning program in Secondary Education. These students must however, complete at least four hours of Earth Science (Geol 101 and 101L Physical Geology, Geog 121 and 121L Physical Geography, or Geog 134 and 134L, Introduction to Global Climate).

Formal admission to Teacher Education is required and is normally sought while enrolled in T&L 200 (see Department of Teaching and Learning listing).

Biology majors seeking secondary certification must have an adviser both in the Biology Department and in the Department of Teaching and Learning.
B.S. 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 Curriculum:

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<tr>
<th>Course Code</th>
<th>Title</th>
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<tr>
<td>Biol 150, 151</td>
<td>General Biology I &amp; II</td>
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<tr>
<td>Biol 150L, 151L</td>
<td>General Biology I Lab</td>
<td>2</td>
</tr>
<tr>
<td>Biol 315</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td>Biol 332, 332L</td>
<td>General Ecology and Lab</td>
<td>4</td>
</tr>
<tr>
<td>Biol 338</td>
<td>Animal Behavior</td>
<td>2</td>
</tr>
<tr>
<td>Biol 431</td>
<td>Wildlife Management</td>
<td>4</td>
</tr>
<tr>
<td>Biol 438</td>
<td>Fisheries Management</td>
<td>3</td>
</tr>
<tr>
<td>Biol 442</td>
<td>Physiology of Organisms and Systems</td>
<td>4</td>
</tr>
<tr>
<td>Biol 470</td>
<td>Biometry</td>
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2 hours from:

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<tr>
<td>Biol 330</td>
<td>Animal Behavior Lab</td>
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<tr>
<td>Biol 371</td>
<td>Anatomy and Adaptations Lab</td>
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3 hours from:

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<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Biol 312</td>
<td>Evolution</td>
<td>3</td>
</tr>
<tr>
<td>Biol 333</td>
<td>Population Biology</td>
<td>3</td>
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<tr>
<td>Biol 370</td>
<td>Vertebrate Zoology</td>
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3-4 hours from:

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<tr>
<td>Biol 363</td>
<td>Entomology</td>
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<td>Biol 364, 364L</td>
<td>Parasitology and Lab</td>
<td>4</td>
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<tr>
<td>Biol 375</td>
<td>Invertebrate Zoology</td>
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<tr>
<td>Biol 431</td>
<td>Fish and Wildlife Disease</td>
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3 hours from:

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<tr>
<td>Bot 301</td>
<td>Biochemistry Lecture</td>
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<td>Biol 341</td>
<td>Cell Biology</td>
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4 hours from:

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<tr>
<td>Biol 336</td>
<td>Systematic Botany</td>
<td>4</td>
</tr>
<tr>
<td>Biol 360</td>
<td>Freshwater Algae</td>
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III. Required in other departments:

<table>
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<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>Chem 121/121L</td>
<td>General Chemistry I and Lab</td>
<td>4</td>
</tr>
<tr>
<td>Chem 122/122L</td>
<td>General Chemistry II and Lab</td>
<td>4</td>
</tr>
<tr>
<td>Chem 249/240L</td>
<td>Organic Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>Comm 100</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
</tbody>
</table>

4 hours from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol 101</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>Phys 211</td>
<td>College Physics I</td>
<td>4</td>
</tr>
</tbody>
</table>

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.

One summer of field experience or study at a recognized biological station is required.

MINOR IN BIOLOGY

Required 20 hours including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biol 150, 151</td>
<td>General Biology I &amp; II</td>
<td>6</td>
</tr>
<tr>
<td>Biol 150L, 151L</td>
<td>General Biology I Lab</td>
<td>2</td>
</tr>
</tbody>
</table>

12 hours of Advanced Courses with at least one course in each of the three basic areas of Biology (Cellular/Subcellular, Organismal, Population and Community Biology). No more than one biological sciences course from outside the department may be petitioned toward completion of this minor.

Courses

Note: all biology courses that count as upper division labs are marked with asterisk.

111. Concepts of Biology, (CCN) 3 credits. Intended for non-science majors seeking general knowledge and cultural appreciation of contemporary biology. Does not serve as a prerequisite for 101 or any other biology course. Students may not normally receive credit for both 100 and 101-102. F,S

111L. Concepts of Biology Laboratory, (CCN) 1 credit. Prerequisite or co-requisite: Biol 100. A basic biology laboratory to complement Biol 111. F,S

124. Environmental Science, (CCN) 2 credits. A study of the effect of human activity upon the environment in which we live. F, S

150, 151. General Biology I & II, (CCN) 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 101, 102. A contemporary biology laboratory to complement Biol 150, 151.

200. Topics in Biology, 1-3 credits. Special topics in biology. Primarily intended for non-majors. May be repeated if topic is different. On demand.

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, (CCN) 3 credits. An introduction to genetics, with emphasis on classical genetic analysis and the biochemistry of gene transmission, expression and regulation. F

332. General Ecology, 3 credits. Prerequisite: course in systematics desirable. A study of the relationships of organisms 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,S

333. Population Biology, 3 credits. Principles of population genetics, population ecology, and survival in plants and animals. F

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. F

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: Chem 121 and 122. Corequisite: Chem 122. Description of processes common to life at the cellular level including: biochemical and structural organization, membrane function, mortality, 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 Form and Function, 3 credits. Prerequisite: Biol 150/151 or permission of instructor. Structure and function of plants at the cellular, tissue, and whole plant levels. Topics will also include ecological adaptations and plant-derived products. S,S

363. Systematics, 4 credits. Structure, functions, life history, classification, habitats and distribution of insects. F

364. Parasitology, 2 credits. Classification, structure, functions, 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. Microscopic 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 Adaption Laboratory, 2 credits. Prerequisite or co-requisite: Biology 370. Dissections of representatives of various vertebrate classes; examination of morphological adaptations. F

372. Natural History of the Tropics, 3 credits. Prerequisite: Consent of the instructor: Interdisciplinary field course emphasizing study of tropical environments, flora and fauna, their natural history & conservation. Lectures at UND followed by field work at terrestrial and marine sites in Costa Rica. Semiannually.

373. Vertebrate Natural History, 3 credits. Classification, distribution and habits of vertebrates. S

378. Developmental Biology, 3 credits. Prerequisite: Biol 315. A study of the diverse developmental systems of animals, plants and microbial organisms. F

379. Comparative 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/U grading only. F,S,S

420. Neuroscience, 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. S

431. Wildlife Management, 4 credits. Theory and methods of management of game populations. F
432. Fish and Wildlife Disease. 3 credits. A detailed survey of bacteriologic, viral, and mycotic diseases, parasites and pathological conditions found in fish and wildlife species. Material covered will include importance, etiology, diagnosis, symptoms, lesions, pathogenicity, vectors and modes of transmission. F, G.

433. Aquatic Ecology. 3 credits. Analysis of the relationships between organisms and their physical, chemical and biological environments in freshwater ecosystems. F, G.

433L* Aquatic Ecology Laboratory, 1 credit. Co-requisite: Biol 433. Field and laboratory activities to complement Biol 433. F

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. F

442. Physiology of Organs and Systems. 3 credits. Study of the physiology of organs and organ systems in vertebrates. F

442L* Physiology of Organs and Systems Laboratory, 1 credit. Pre- or corequisite: Biol 442. A physiology laboratory to complement Biol 442. F

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 and design of experiments with emphasis upon biological models. Includes descriptive and inferential statistics through analysis of variance and introductory problems of bioassay. 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.

489. Senior Honors Thesis, (CCN) 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

491. Seminar, (CCN) 1 credit. Prerequisite: Major or minor in biology. Discussion of selected topics in advanced biology; a different topic each semester. F, S

492. Research, (CCN) 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, (CCN) 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, (CCN) 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* Current Issues in Global Economics (3)
   - Econ 438* International Money and Finance (3)
   - Fin 430 International Financial Management (3)
   - Mgmt 420 Multinational Management (3)
   - Mkkt 425* International Marketing (3)
   - Mkkt 425** Current Prospectives in Global Marketing (3)
   *only one of the above economic courses may be used.
   **only one of the above marketing courses may be used.

2. Completion of 9 hours from the following:
   - Anth 171 Cultural Anthropology (3)
   - GeoG 104 World Regional Geography (3)
   - Hist 102 Western Civilization II (3)
   - Pols 220 International Politics (3)
   - Pols 225 Comparative Politics (3)
   - completion of Level II proficiency in a language (8 hours) or approved university study abroad (6 hours)

3. Completion of B.B.A. or B.Acc. degree.

Business Education and Vocational Marketing Education (ISBE/BOTE)

M. Robles (Chair), Braathen, O’Keefe, and Prigge

The Bachelor of Science in Education degree with a major in Business Education is offered through the Department of Information Systems and Business Education in the College of Business and Public Administration. This degree prepares students to teach business education subjects in high schools, junior high schools, and vocational-technical schools in nearly every state in the United States. It prepares students to meet the professional requirements for certification as vocational coordinators of business and office education programs in North Dakota. A broad general education background essential for success in teaching is provided. A core of courses in business administration prepares students for careers in business as well.

College of Education and Human Development

The B.S.Ed. degrees require the completion of the College of Education and Human Development Program in Secondary Education. See College listing.

B.S.ED. WITH MAJOR IN BUSINESS EDUCATION

Required 125 credits (36 credits 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. ISBE Core Curriculum, including:
   - Acct 200, 201 Elements of Accounting I & II (3)
   - Acct 315 Business in the Legal Environment (3)
   - Comm 110 Fundamentals of Public Speaking (3)
   - Econ 201 Principles of Microeconomics (3)
B.S.B.A. WITH A MAJOR IN VOCATIONAL MARKETING 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. The Following Curriculum:

Acct 200, 201........ Elements of Accounting I & II.........(6)
Acct 315........ Business in the Legal Environment.........(3)
BOTE 102........ Keyboarding I..............................(1)
BOTE 152........ Keyboarding II..............................(2)
ISys 217........ Fundamentals of Management..............(3)
ISys 315........ Records and Information Management......(3)
ISBE 303........ Methods of Teaching Business Education—General Methods.........(1)
ISBE 303........ Methods of Teaching Business Education—Entrepreneurship Methods........(1)
ISBE 320........ Professional Communication for Business........(3)
ISBE 380........ DECA-Student Leadership Practicum........(3)
ISBE 402........ Curriculum Development in Vocational Marketing Education........(3)
ISBE 403........ Prof Training Techniques in Business and Education........(3)
ISBE 460........ Methods of Teaching Vocational Education........(2)
Comm 110........ Fundamentals of Public Speaking........(3)
Econ 201........ Principles of Microeconomics..............(3)
Econ 202........ Principles of Macroeconomics..............(3)
Mgmt 300........ Principles of Management.................(3)
Mktg 305........ Marketing Foundations......................(3)
Mktg 311........ Personal Selling...............................(3)
Mktg 312........ Advertising....................................(3)
Mktg 315........ Retail Management...........................(3)

ISBE 421........ Coordinating Techniques....................(2)
ISBE 421........ Coordinating Techniques....................(2)
ISBE 431........ Career and Vocational Education of Special Needs Students................(3)
Electives............Approved by Program Coordinator........(6)

III. One of the Following Concentrations:

CONCENTRATION I—VOCATIONAL BUSINESS AND OFFICE EDUCATION:
For those preparing to teach all business subjects. The following additional courses are required for this concentration:

ISys 305........ End-User Applications....................(3)
ISys 315........ Records and Information Management......(3)
BOTE 147........ Word Processing............................(3)
ISBE 303........ Methods of Teaching Business Subjects........(3-5)
BOTE 375........ Administrative Office Procedures........(3)
**ISBE 421........ Coordinating Techniques....................(2)
ISBE 431........ Career and Vocational Education of Special Needs Students................(3)

CONCENTRATION II—ACCOUNTING AND BUSINESS EDUCATION:
For those who wish to teach accounting, business law, data processing, and the basic business subjects. The following additional courses are required for this concentration:

Acct 301, 302........ Intermediate Accounting I & II.........(8)
Acct 320........ Accounting for Production................(3)
ISys 305........ End-User Applications....................(3)
ISys 315........ Records and Information Management......(3)
ISBE 303........ Methods of Teaching Business Subjects........(3-5)
**ISBE 421........ Coordinating Techniques....................(2)
ISBE 431........ Career and Vocational Education of Special Needs Students................(3)
Electives............Approved by Program Coordinator........(6)

**Required for office education coordinators in reimbursable vocational programs.

MINORS

Minor in Vocational Marketing Education

20 semester hours, including:

ISBE 380........ DECA-Student Leadership Practicum........(1)
ISBE 402........ Curriculum Development in Vocational Marketing Education........(3)
ISBE 403........ Prof Training Techniques in Business and Education........(3)
ISBE 460........ Methods of Teaching Vocational Education........(2)
Mktg 305........ Marketing Foundations......................(3)
Mktg 311........ Personal Selling...............................(3)
Mktg 312........ Advertising....................................(3)
Mktg 315........ Retail Management...........................(3)

Electives: 5 hours from selected courses from ISBE/ISys and/or from the College of Business and Public Administration.

Minor in Office Administration

Not available for Information Systems majors.

23 hours, including:

ISys 217........ Fundamentals of Management..............(4)
ISys 305........ Information Systems.......................(4)
ISys 308........ Information Resource Administration.......(3)
ISys 315........ Records and Information Management......(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.

Minor in Secretarial Administration

23 hours, including:

BOTE 147........ Word Processing............................(3)
BOTE 152........ Keyboarding II..............................(2)
BOTE 202........ Keyboarding III.............................(2)
ISys 217........ Fundamentals of Management..............(4)
ISys 305........ End-user Applications....................(3)
ISys 315........ Records and Information Management......(3)
BOTE 375........ Administrative Office Procedures........(3)
Elect five hours from courses in ISBE/ISys.

Minor in Business Education Teaching

22 hours, including:

BOTE 147........ Word Processing............................(3)
BOTE 152........ Keyboarding II..............................(2)
BOTE 202........ Keyboarding III.............................(2)
ISBE 303........ Methods of Teaching Business Subjects........(3-5)
ISys 217........ End-user Applications....................(4)
ISys 305........ End-user Applications....................(3)
ISys 308........ Information Resource Administration.......(3)
Elect 3-4 hours in ISBE/ISys and/or from the College of Business and Public Administration.

Courses

Students who have had prior training in keyboarding are eligible for advanced placement. They should consult with a member of the Information Systems and Business Education faculty to determine appropriate course level.

BOTE 102. Keyboarding I. (CCN:BOTE) 1 credit. A half-semester course offering basic instruction and practice in learning the correct finger formation of the alphanumeric keyboard, developing secretarial, and manipulative skills for operating the keyboard of data/word processing equipment, microcomputers, or computer terminals. F

BOTE 147. Word Processing. (CCN:BOTE) 3 credits. Orientation to word processing and data processing software, hands-on applications, and skill development. F

BOTE 152. Keyboarding II. (CCN:BOTE) 2 credits. Prerequisite: BOTE 147. Development of speed and accuracy, letter writing, manuscripts, and tabulation techniques. F

BOTE 202. Keyboarding III(CCN:BOTE) 2 credits. Prerequisites: BOTE 152 or equivalent. Skill development, rough drafts, statistical keyboarding, preparation of manuscripts, reports, legal forms, and display typing. S

303. Methods of Teaching Business Education. 1 to 5 credits. Five areas of teaching methods comprise the course: (a) general methods, (b) keyboarding methods, (c) local area networking methods, (d) accounting/bookkeeping methods, (e) entrepreneurship methods; each to be taught for an equal number of weeks and each to be one credit hour. The general methods area and entrepreneurship methods area are required of all business education and marketing education students. Selection of the other areas is determined by curricula in which students are enrolled. S

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 writing, as well as a brief review of writing mechanics. Clear, concise, effective presentation and logical organization of business messages are emphasized. F

BOTE 375. Administrative Office Procedures. (CCN:BOTE) 3 credits. Prerequisite: BOTE 147. Advanced word processing concepts and applications as well as desktop publishing, computerized shorthand, and other technologies. S
Chemical Engineering (ChE)

A. R. Hasan (Chair), Erjavec, Mann, Muggli, and Seames

The department’s primary objective is the education of undergraduate students so that, upon graduation, they are prepared to take responsible entry-level positions in the chemical process and related industries. Research and professional activities by members of the faculty, conducted in collaboration with graduate and undergraduate students, contribute to the education of students and the professional growth of faculty.

Graduates from the program are well qualified to practice the profession of chemical engineering in a broad spectrum of industries including biotechnology, chemicals, consumer products, electronic materials, energy, food, polymers, pulp and paper, and the environment. They may be engaged in research, teaching, development, manufacturing, technical support, marketing, sales or project engineering, and frequently enter engineering management later in their careers. For graduates interested in obtaining advanced degrees in chemical engineering, the program provides a thorough grounding in fundamentals. In addition, the prescribed curriculum provides a sound, technically based general education for those graduates who pursue other professional interests, such as medicine, law and business.

The core of the program is a strong technical curriculum, whereby the fundamentals of the chemical sciences, mathematics, and chemical engineering are learned. This core is complemented by general courses in other engineering disciplines to provide greater exposure to the engineering profession and to help prepare the students for professional registration.

Four of the engineering courses are electives, which gives each student the opportunity to tailor the program to his/her individual interests such as environmental concerns, materials, bio-processes, etc. Other prescribed courses include topics such as economics, statistics and ethics. The program also gives students a chance to become proficient in skills such as computer use, oral and written communication, and team work.

The undergraduate program culminates in a senior capstone design course in which the students bring together all they have learned as they work in teams on a process design and evaluation project. UND’s program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET). Practical, hands-on experience is gained in laboratories distributed throughout the undergraduate program. Lab experiments form a significant part of each student’s learning beginning immediately in first year chemistry and continuing through the curriculum. In addition to university experiences, which include opportunities to conduct research, students are encouraged to spend time working in the engineering profession via summer internships or cooperative education.

Besides the technical education embodied in the program, there is a strong general education component, which is also required. It is included to round out the individual’s university experience, and help prepare them 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 25-30 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 institutions.

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 (BSChem)/Master of Science (with a major in chemical engineering) and BSChem/Master of Engineering degrees. For more detailed information, see Graduate School section.

School of Engineering and Mines

B.S. IN CHEMICAL 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:

First Semester Second Semester

Chem 102 Introduction to Chemical Engineering (4)
Chem 121/121L General Chemistry I and Laboratory (4)
Chem 122/122L General Chemistry II and Laboratory (4)
Engl 110 College Composition I (3)
Engr 101 Graphical Communication (3)
Math 166 Calculus I (4)
Phys 251 University Physics I (4)
Arts/Humanities GER (3)
Social Science GER (3)

Sophomore Year

Chem 201 Stoichiometry (3)
Chem 232 Chemical Engineering Laboratory I (2)
Chem 341/341L Organic Chemistry and Laboratory (5)
Econ 201 Principles of Microeconomics (3)
EE 206 Electrical Engineering Fundamentals (3)
### University of North Dakota

**Courses**

#### Junior Year

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ChE 301</td>
<td>Transport Phenomena</td>
<td>4</td>
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<tr>
<td>ChE 306</td>
<td>Unit Operations in Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ChE 331/332</td>
<td>Chemical Engineering Laboratory II and III</td>
<td>2</td>
</tr>
<tr>
<td>ChE 333</td>
<td>Basic Experimental Strategies</td>
<td>1</td>
</tr>
<tr>
<td>ChE 405</td>
<td>Mass Transfer Operations</td>
<td>3</td>
</tr>
<tr>
<td>Chem 465</td>
<td>Physical Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>Phil 370</td>
<td>Ethics in Engineering and Science</td>
<td>3</td>
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*Advanced chemical science Elective...* | 3 |
*Engineering science elective...* | 3 |
*Technical Elective I...* | 3 |
*Technical Elective II...* | 3 |

#### Senior Year

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<th>Course Code</th>
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<tr>
<td>ChE 403</td>
<td>Chemical Engineering Thermodynamics</td>
<td>3</td>
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<tr>
<td>ChE 408</td>
<td>Chemical Process Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ChE 412</td>
<td>Chemical Engineering Plant Design</td>
<td>6</td>
</tr>
<tr>
<td>ChE 421</td>
<td>Chemical Engineering Reactor Design</td>
<td>3</td>
</tr>
<tr>
<td>ChE 431</td>
<td>Chemical Engineering Laboratory IV</td>
<td>3</td>
</tr>
<tr>
<td>Engr 460</td>
<td>Engineering Economy</td>
<td>3</td>
</tr>
<tr>
<td>Arts and Humanities (GER)</td>
<td>3</td>
<td></td>
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<tr>
<td>Social Science (GER)</td>
<td>3</td>
<td></td>
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<tr>
<td>ChE 405</td>
<td>Mass Transfer Operations</td>
<td>3</td>
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<tr>
<td>ChE 431</td>
<td>Chemical Engineering Laboratory IV</td>
<td>3</td>
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<tr>
<td>Technical Elective I</td>
<td>3</td>
<td></td>
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<tr>
<td>Technical Elective II</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

*Lists of courses that satisfy the requirements for the various electives are available in the department office.

**Some of the following courses may be waived by completing Engr 100 Professional Assessment and Evaluation: Engr 101, ChE 102, and ChE 357. Phil 370 may also be waived, but not the University’s GER. (See Engr 100 course description on pg. 96).**

*Engl 120 — College Composition I may be substituted.

#### Chemistry (Chem)

H. Abrahamson (Chair), Ballantine, Bennett, Borgerding, Hoffmann, Kozliak, Pierce, Shay, Smoliková, Stahl, Thomasson, and Tilotta

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. Those students also qualify for the department’s 5-year BS/MS program (non-thesis M.S. option). Students who desire a course of study which is less concentrated in chemistry in order to prepare themselves for advanced work in other fields should pursue the program leading to the B.S. degree with a major in chemistry. Those students who wish to prepare themselves for teaching in High School may pursue the program leading to the B.S. degree with a major in chemistry in the College of Arts and Sciences and take additional courses in the Department of Teaching and Learning to qualify for teaching certification. The specific course requirements for each of these major programs are listed below.

#### Graduate Study

The Department of Chemistry offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy with majors in inorganic chemistry, organic chemistry, physical chemistry and analytical chemistry. In order to pursue graduate work in chemistry, the student must have the baccalaureate degree with a major in chemistry. 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:

1. General Education Requirements (see University GER listing).
II. The Following Curriculum:

Major Requirements—53 hours including:

<table>
<thead>
<tr>
<th>FRESHMAN YEAR</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 121, 121L</td>
<td>General Chemistry I &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>Chem 122, 122L</td>
<td>General Chemistry II &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>Chem 116</td>
<td>Introduction to Organic and Biochemistry</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 110</td>
<td>College Composition I</td>
<td>(3)</td>
</tr>
<tr>
<td>'Engl 125</td>
<td>Technical and Business Writing</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>'Humanities or Social Science Elective</td>
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<td>(1)</td>
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<tr>
<td>Total Hours</td>
<td></td>
<td>16 15</td>
</tr>
</tbody>
</table>

| SOPHOMORE YEAR | | |
|----------------|-----------------|
| 'Chem 330      | Quantitative Analysis | (4) |
| Chem 341, 341L | Organic Chemistry I & Lab | (5) |
| Chem 342, 342L | Organic Chemistry II & Lab | (5) |
| Phys 251, 252L | University Physics I & II | (4) |
| Math 265      | Calculus III | (4)             |
| 'Humanities or Social Science Elective | (3) | (3) |
| Total Hours   |              | 16 16           |

| JUNIOR YEAR | | |
|----------------|-----------------|
| Chem 464, 464L | Physical Chemistry I, II | (3) |
| Chem 455      | Spectroscopy and Structure | (3) |
| Chem 461      | Instrumental Analysis | (5) |
| Level II Language | (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 BioCh 301) | (3) | (3) |
| 'Electives | (5) | (9) |
| Total Hours   |              | 16 16           |

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 including:

<table>
<thead>
<tr>
<th>Option A. Physical Science Emphasis FRESHMAN YEAR</th>
<th>Fall</th>
<th>Spring</th>
</tr>
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<tbody>
<tr>
<td>Chem 121, 121L</td>
<td>General Chemistry I &amp; Lab</td>
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</tr>
<tr>
<td>Chem 122, 122L</td>
<td>General Chemistry II &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>Engl 110</td>
<td>College Composition I</td>
<td>(3)</td>
</tr>
<tr>
<td>'Engl 125</td>
<td>Technical and Business Writing</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 166</td>
<td>Calculus I</td>
<td>(4)</td>
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<tr>
<td>Math 166</td>
<td>Calculus II</td>
<td>(4)</td>
</tr>
<tr>
<td>'Humanities or Social Science Elective</td>
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</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>16 15</td>
</tr>
</tbody>
</table>

| SOPHOMORE YEAR | | |
|----------------|-----------------|
| 'Chem 333      | Intro Env Clin Forens | (4) |
| Chem 341, 341L | Organic Chemistry I & Lab | (5) |
| Chem 342, 342L | Organic Chemistry II & Lab | (5) |
| Phys 251, 251L | University Physics I & II | (5) |
| Phys 252, 252L | University Physics I & II | (5) |
| Math 265      | Calculus III | (4) |
| 'Humanities or Social Science Elective | (6) |
| Total Hours   |              | 17 15           |
| OR | | |
| 'Chem 330      | Quantitative Analysis | (4) |

<table>
<thead>
<tr>
<th>Option B. Health Sciences Emphasis FRESHMAN YEAR</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 121, 121L</td>
<td>General Chemistry I &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>Chem 122, 122L</td>
<td>General Chemistry II &amp; Lab</td>
<td>(4)</td>
</tr>
<tr>
<td>Engl 110</td>
<td>College Composition I</td>
<td>(3)</td>
</tr>
<tr>
<td>'Engl 125</td>
<td>Technical and Business Writing</td>
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<tr>
<td>Math 146</td>
<td>Applied Calculus I</td>
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<tr>
<td>'Humanities or Social Science Elective</td>
<td>(6)</td>
<td>(6)</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>16 16</td>
</tr>
</tbody>
</table>

| JUNIOR YEAR | | |
|----------------|-----------------|
| Chem 466      | Physical Chem Laboratory | (3) | (3) |
| Chem 455      | Introduction to Physical and Clinical Forensic Chemistry Analysis | (4) | |
| 'Chem 334      | Organic Chemistry I & Lab | (5) | (5) |
| Chem 341, 341L | Organic Chemistry II & Lab | (5) | (5) |
| Phys 211, 211L | University Physics I & II | (4) | (4) |
| Phys 212, 212L | University Physics I & II | (4) | (4) |
| 'Humanities or Social Science Elective | (6) | (6) |
| Total Hours   |              | 16 16           |

| SENIOR YEAR | | |
|----------------|-----------------|
| Chem 467      | Survey of Physical Chemistry | (3) | (3) |
| Chem 455      | Biochemistry Lecture | (3) | (3) |
| Level II Language | (4) |
| 'Electives | (12) | (5) |
| Total Hours   |              | 16 16           |

Suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech.

B. Graduate level courses in Chemistry may be taken as electives.

MINOR IN CHEMISTRY

Required. A minimum of 20 semester hours unless otherwise required for the student's major. The 20 semester hours shall include one year of general/inorganic chemistry with laboratory, one semester of analytical chemistry with laboratory, and one year of organic chemistry 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.

*With permission of the advisor, a student may substitute English 120 of English 125 is not available.

*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.

*To fulfill the University Graduation Requirements, a minimum of 3 credit hours in Arts and Humanities (in addition to languages) and 9 credit hours in Social Sciences must be taken (see University GER listing).

*Either Chem 333 (Fall) or Chem 330 (Spring) should be taken, not both. Which one is taken affects the number of hours available for electives.

*Graduate level courses in Chemistry may be taken as electives.

With permission of the adviser, a student may substitute English 120 if English 125 is not available.

If a student is not ready for Math 146, Math 103 should be taken in the first semester. If a student would like the option to change into the B.S. in Chemistry or the B.S. with Major in Chemistry with emphasis for the Physical Science Option wishes to change into the Health Science Option, Math 165 will not substitute for Math 146.

To fulfill the University Graduation Requirements, a minimum of 6 credit hours in Arts and Humanities (in addition to languages) and 9 credit hours in Social Sciences must be taken (see University GER listing).

*Only Chem 330 (Spring) is acceptable; Chem 333 may not be substituted.

Suggested electives are courses in Physics, Mathematics, Biochemistry, Biology, Languages, Computer Science, Chemical Engineering, Business Management, and Speech.

With permission of the adviser, a student may substitute English 120 if English 125 is not available.
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:

- BiCh 301: Biochemistry Lecture
- Biol 150, 151: General Biology I & II
- Biol 150L, 151L: General Biology Lab I & II
- 4 credits from: Geol 101, 101L: Physical Geology
- Geog 121, 121L: Physical Geography

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 200 (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 students to fulfill a B.S. in Chemistry program with additional study past a B.S. degree in Chemistry. Students would then be eligible to take national certification examinations 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. (CCN) 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. (CCN) 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. (CCN) 1 credit. Corequisite: Chem 115. Laboratory to accompany Chem 115. F,S

116. Introduction to Organic and Biochemistry. (CCN) 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 alkanes, alkenes, alkyne, aromatics, alcohols, 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. (CCN) 1 credit. Corequisite: Chem 116. Laboratory to accompany Chem 116. F,S

121. General Chemistry I. (CCN) 3 credits. Prerequisite: Math 102. Corequisites: Chem 121L, a 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, thermodynamics, bonding, molecular geometry, periodicity, gases. Required of all chemistry majors. F,S,SS

121L. General Chemistry I Laboratory. (CCN) 1 credit. Corequisite: Chem 121. Laboratory to accompany Chem 121. Required of all chemistry majors. F,S,SS

122. General Chemistry II. (CCN) 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. F,S,SS

122L. General Chemistry II Laboratory. (CCN) 1 credit. Prerequisite: Chem 121L. Corequisite: Chem 122. Laboratory to accompany Chem 122. Required of all chemistry majors. F,S,SS

240. Survey of Organic Chemistry. (CCN) 4 credits. Prerequisites: Chem 122 and 122L. Corequisite: Chem 240. For all students interested in a semester survey of organic chemistry. Structure and bonding, nomenclature; hydrocarbons: alkanes, alkenes, aromatics; substituted hydrocarbons: alkylic halides, stereochemistry, alcohols, phenols, ethers, amines; carboxylic acids, esters, amides, SS

240L. Survey of Organic Chemistry Laboratory. (CCN) 1 credit. Prerequisite: Chem 240L. Corequisite: Chem 240. Laboratory to accompany Chem 240. S,SS

330. Quantitative Analysis. (CCN) 4 credits. Prerequisites: Chemistry 122 and 122L. Recommended for chemistry majors and chemical engineering majors. Principles and applications of chemical stoichiometry, equilibria, and spectrophotometry to modern chemical analysis. S

333. Introductory Environmental, Clinical, and Forensic Chemical Analysis. 4 credits. Prerequisites: Chem 122 and Chem 122L or written permission of the instructor. For all science majors interested in using analytical chemistry techniques in a modern science laboratory. Principles of quantitative and qualitative chemical analysis as applied to environmental, clinical, and forensic science are covered. F

341. Organic Chemistry I. (CCN) 4 credits. Prerequisite: Chem 122 with a grade of C or better or permission of the Chemistry Department. 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. F,S

341L. Organic Chemistry I Laboratory. (CCN) 1 credit. Prerequisite: Chem 122L. Corequisite: Chem 341. Laboratory to accompany Chem 341. Required for chemistry majors. F,S


342L. Organic Chemistry II Laboratory. (CCN) 1 credit. Prerequisite: Chem 341L. Corequisite: Chem 342. Required for all chemistry majors. Laboratory to accompany Chem 342. F,S

392. Special Problems in Chemistry. 1 to 3 credits. Prerequisite: consent of instructor. Total credits not to exceed 3. Opportunity for students to work on research problems under close faculty guidance. 3/9 grading only. F,S

397. Cooperative Education. 8 credits. May be repeated for a maximum of 12 credits. Prerequisites: one year of freshman chemistry with laboratory and either one of the following core sequences: ChE 141, 342, SS grading only. F,S

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 diffractive 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

461. 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,2

461L. Instrumental Analysis Laboratory. 2 credits. Prerequisites: Chem 461. Laboratory experiences utilizing modern instrumental methods to address problems of quantitative and qualitative analysis. S,2

462. 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 and analytical methods. F

463. Advanced Synthesis Laboratory. 3 credits. Prerequisites: Chem 462 or 467 and 455. Advanced synthetic, separatory and characterization methods currently 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. S

466. Survey of Physical Chemistry. 4 credits. Prerequisites: Chem 342, Math 146 and Phys 212. Required for chemistry majors in the B.S. with Major in Chemistry with Emphasis in Health Sciences option. Survey of topics in physical chemistry with an emphasis for the life sciences. Topics include chemical thermodynamics, kinetics, introductory quantum mechanics, and spectroscopy. S

467. Survey of Physical Chemistry Laboratory. 2 credits. Prerequisite: Chem 466. The solution of chemical problems in the laboratory using physical and biophysical methods. F

488. Undergraduate Seminar. 1 credit. Corequisite: Chem 492 or 463. Required for B.S. in Chemistry. Introduction to current research in chemistry and to professional chemistry seminar preparation. S


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 (CE)
Abolmaali, Gullicks, Jerath, Mason, Moretti, and Uddin

The mission of the civil engineering program at the University of North Dakota is to provide students with a well-rounded civil engineering education. Graduates of the program will be prepared to function effectively in a wide range of professional settings such as engineering consulting firms, industries and governmental agencies. The civil engineering program emphasizes the areas of environmental engineering,
geotechnical engineering, structural engineering, and water resources engineering. The required curriculum includes the fundamentals for each of these areas and provides an opportunity for additional learning experiences with technical electives and a major design experience.

Teamwork, problem solving, and design exercises are interwoven throughout the curriculum; culminating in a two-semester, capstone design project during the senior year. Several courses include laboratories which develop experimental, teamwork, and communication skills. Technical reports and/or presentations required in several courses develop knowledge of contemporary issues and life-long learning skills, as well as communication skills. Relevant computer software is used throughout the curriculum. Students are strongly encouraged to prepare for a professional license by taking the national Fundamentals of Engineering (FE) exam prior to graduation. Students who excel academically are also well qualified to pursue graduate work in civil engineering or a related field.

The following are the educational objectives 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).

**School of Engineering and Mines**

**B.S. IN CIVIL 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:

<table>
<thead>
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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
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<tr>
<td>CE 313</td>
<td>General Surveying</td>
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<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Eng 212</td>
<td>Technical &amp; Business Writing</td>
<td>3</td>
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<tr>
<td>Engr 201</td>
<td>Statics</td>
<td>3</td>
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<tr>
<td>Engr 202</td>
<td>Dynamics</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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<td>Math 266</td>
<td>Elementary Differential Equations</td>
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<td>Math 251</td>
<td>University Physics/Laboratory</td>
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<tr>
<td>Math 252</td>
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<tr>
<td>CE 303</td>
<td>Civil Engineering Lab</td>
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<tr>
<td>CE 306</td>
<td>Fluid Mechanics</td>
<td>3</td>
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<tr>
<td>CE 351</td>
<td>Structural Mechanics</td>
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<td>CE 412</td>
<td>Soil Mechanics</td>
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<td>CE 421</td>
<td>Hydrology</td>
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<td>CE 423</td>
<td>Hydraulic Engineering</td>
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<td>CE 431</td>
<td>Environmental Engineering I</td>
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<td>CE 451</td>
<td>Steel Design</td>
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<td>EE 206</td>
<td>Circuit Analysis</td>
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<td>Engr 460</td>
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<td>EE 416</td>
<td>Transportation Engineering</td>
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<td>EE 432</td>
<td>Environmental Engineering II</td>
<td>2</td>
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<tr>
<td>EE 444</td>
<td>Contracts and Specifications</td>
<td>2</td>
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<tr>
<td>EE 453</td>
<td>Reinforced Concrete</td>
<td>2</td>
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<tr>
<td>EE 482</td>
<td>Civil Engineering Design</td>
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<tr>
<td>EE 483</td>
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<td>Phil 370</td>
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</tr>
<tr>
<td>Social Science</td>
<td></td>
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</tr>
</tbody>
</table>

**Courses**


**306. Fluid Mechanics**, 3 credits. Prerequisites: Phys 251 and 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.

**313. General Surveying**, 4 credits. Prerequisite: Math 165. Measurements of distances and angles; instrument adjustment; EDM, satellite and inertial systems; triangulation; differential leveling; azimuth by solar observation; simple, compound, and spiral horizontal curves; vertical curves; traverse surveys; state plane coordinate systems; U.S. public land surveys; earthwork; boundary surveys; construction surveys; principles of geometric roadway design.

**315. Structural Mechanics**, 4 credits. Prerequisite: Eng 203. Reactions, shear and bending moment, plate 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.

**397. Cooperative Education**, 1-8 credits repeatable to 24. Prerequisite: Admission to the civil 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

**412. Soil Mechanics**, 3 credits. Prerequisite: Engr 203. Soil characteristics, steady-state and transient water flow in soil, soil deformation, conditions at failure in cohesionless and cohesive soils and plastic-equilibrium states in soil.

**414. Foundation Engineering**, 4 credits. Prerequisite: CE 412. Lateral earth pressure, retaining structures, soil exploration and sampling, bearing capacity, spread footings, mat foundations, settlement analysis, drilled shaft and pile foundations, stability of slopes; laboratory exercises — index properties, moisture density relations, consolidation, shear strength, and permeability.

**416. Transportation Engineering**, 3 credits. Prerequisite: CE 412. Transportation systems; urban transportation planning; design of land, air and water transportation facilities; and future developments in transportation.

**421. Hydrology**, 3 credits. Measurement, interpretation, analysis and application of hydrologic data; precipitation, evaporation and transpiration; runoff hydrographs; routing methods; groundwater; snow hydrology; Computer applications.

**423. Hydraulic Engineering**, 3 credits. Prerequisite: CE 306. Fluid statics and dynamics; open channel flow; transitions and controls; hydraulic structures; hydraulic power conversion; Laboratory: Laboratory techniques and model studies; calibration principles and fluid measurements; open channel, pipeline and hydraulic machinery experiments.


**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.

**451. Steel Design**, 3 credits. Prerequisite: CE 351. Selection of sections, riveted and welded connections, plate girders, trusses, bearings, lightgage structural members, fatigue of structural members and introduction to plastic design.
Clinical Laboratory Science (CLS)

R. Sofher (Chair), A. W. Bruce (Program Director), Banman, Coleman, Larson, Pour, and Torgerson

Clinical laboratory scientists or medical technologists are essential members of the health care team. A clinical laboratory scientist uses the latest biomedical instruments, often interfaced with computers, to perform and generate accurate, reliable laboratory tests. Results of the tests determine the presence of disease, aid in treatment, and monitor therapy. This is a dynamic profession that changes as new medical knowledge is discovered.

Careers in clinical laboratory science are many and varied. Employment opportunities exist in hospitals, private laboratories, physician offices, clinics, government agencies, industry, research, armed forces and other health related facilities. A current shortage of clinical laboratory scientists exists and the demand for new graduates is expected to rise in the next decade.

The University of North Dakota has offered a degree in clinical laboratory science (formerly medical technology) since 1949. The Clinical Laboratory Science (CLS) program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Graduates of the program will be eligible to sit for several national certification examinations. In addition to certification, some states have specific requirements for licensure of clinical laboratory personnel which vary from state to state.

Clinical laboratory scientists attain their professional skills through a baccalaureate education with an emphasis in the sciences. Typically students that major in CLS complete their B.S. degree in four years. The CLS program also offers a 4+1 curriculum program. A student is eligible for this program if they have received a B.S. degree in a related major (Chemistry, Biology, or Anthropology) and have a cumulative GPA of at least 2.8. Upon completion of the 4+1 curriculum program the student will receive a certificate from the UND CLS program and be eligible to take a national certification examination to become a certified Clinical Laboratory Scientist. The Chemistry, Biology, and Anthropology programs at UND have specific programs of study for students wishing to participate in the 4+1 curriculum. The CLS degree includes two years of pre-professional (first year and sophomore) education followed by two years of professional (junior and senior) coursework. Application for advancement to the professional education component must be made during the second semester of the sophomore year. Acceptance into the professional program is on a competitive basis with consideration given to science grades, general college preparation, and personal adjustment to the clinical laboratory science field. Once accepted, all students in the professional program must attain a letter grade of at least “C” in their major courses in order to continue in the program. No student will be allowed to complete the senior professional year unless he/she has received at least a grade of “C” in each of the major coursework classes. Exceptions for acceptance and continuance may be made by petition to the Program Director.

The professional education component includes lecture and laboratory courses that prepare the student to work in the profession. Coursework focuses on the clinical application and interpretation of testing, management and utilization, laboratory operations, professionalism and quality assurance. In addition, students spend four months in a student laboratory and six-to-eight months in a medical center setting operating equipment, performing and managing testing activities, evaluating quality control and working with the health care team.

Some of the medical centers currently affiliated with the Clinical Laboratory Science program are: Allina Laboratories/Abbott Northwestern Hospital, Minneapolis, MN; Altru Health System, Grand Forks, ND; Bozeman Deaconess Hospital, Bozeman, MT; Community Medical Center, Missoula, MT; Health East–St. Joseph’s Hospital, St. Paul, MN; Hennepin County Medical Center, Minneapolis, MN; Region Hospital, Fergus Falls, MN; Mayo Clinic, Rochester, MN; Minot Center for Family Medicine, Minot, ND; Presentation Medical Center, Rolla, ND; Riverview Hospital, Crookston, MN; Roseau Area Hospital and Homes, Inc., Roseau, MN; Smith Kline-Beecham Laboratories, New Brighton, MN; St. Alexius Medical Center, Bismarck, ND; St. Cloud Hospital, St. Cloud, MN; St. Patrick’s Hospital, Missoula, MT; St. Vincent’s Hospital and Health Center, Billings, MT; Trinity Medical Center, Minot, ND; West River Regional Medical Center, Hettinger, ND.

The Clinical Laboratory Science program is affiliated with Bemidji State University, Bemidji, MN; Jamestown College, Jamestown, ND; University of Mary, Bismarck, ND; Minot State University, Minot, ND; Montana State University, Bozeman, MT; and the University of Montana, Missoula, MT. Each of these universities/college have developed their curriculums to match the curriculum at the University of North Dakota. Students from the universities/college listed above apply to the University of North Dakota CLS senior year professional program. Upon completion they receive a certificate from the University of North Dakota CLS program 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 at their respective institution.

Applications are also accepted for the senior year professional program from students that have completed their B.S. degree from an NCA accredited college in medical technology, clinical laboratory science, or a science major congruent with the University of North Dakota Clinical Laboratory Science program. Prerequisite course work may be required depending on the curriculum completed at the student’s previous college.

Clinical Laboratory Technician (CLT) or Medical Laboratory Technician (MLT) graduates from a NAACLS or equivalently accredited MLT program are eligible for the transfer of up to 30 semester credits to the B.S. degree program. Transfer credits allow the waiver of several science courses in the preprofessional and 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 competency assessment.

During the senior professional year students register for courses in the summer, fall and spring semesters. Students must be aware that there are special requirements prior to contact with patients and testing of patient specimens. Students are required to have a physical and to be immunized with the Hepatitis B vaccine. If a student elects not to be immunized a liability waiver must be signed. A background check may also be required. Students are responsible for additional costs that include: travel, housing, food, and summer course fees.

A Master of Science degree with a major in Clinical Laboratory Science is also offered. The Master of Science Program is designed to prepare students for careers as administrative laboratory directors, clinical laboratory consultants, technical supervisors, or laboratory educators. The Master of Science degree is described in the graduate section of this catalog.

The Clinical Laboratory Science 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.

**School of Medicine and Health Sciences**

**B.S. IN CLINICAL LABORATORY SCIENCE**

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>Engl 110</td>
<td>(3)</td>
<td>College Composition I</td>
</tr>
<tr>
<td>Biol 150 &amp; 150L</td>
<td>(4)</td>
<td>General Biology I and Laboratory</td>
</tr>
<tr>
<td>Chem 121 &amp; 121L</td>
<td>(4)</td>
<td>General Chemistry I and Laboratory</td>
</tr>
<tr>
<td>Math 103 or 104</td>
<td>(3)</td>
<td>College Algebra or Finite Math</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>Med 100</td>
<td>(2)</td>
<td>Introduction to Health Sciences Professions</td>
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<tr>
<td>Biol 151 &amp; 151L</td>
<td>(3)</td>
<td>General Biology II and Laboratory</td>
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<tr>
<td>Comm 101</td>
<td>(3)</td>
<td>Fundamentals of Public Speaking</td>
</tr>
<tr>
<td>Chem 122 and 122L</td>
<td>(4)</td>
<td>General Chemistry II and Laboratory</td>
</tr>
<tr>
<td>Eng 120 or 125</td>
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<td>College Composition II or Technical and Business Writing</td>
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<tr>
<td><strong>Sophomore Year</strong></td>
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<tr>
<td>Anat 204</td>
<td>(3)</td>
<td>Anatomy for Paramedical Personnel</td>
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<tr>
<td>Engl 100</td>
<td>(2)</td>
<td>Orientation to Medical Laboratory Sciences</td>
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<tr>
<td>Comm 210</td>
<td>(3)</td>
<td>Interpersonal Communications</td>
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<tr>
<td>Psy 111</td>
<td>(3)</td>
<td>Introduction to Psychology</td>
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<tr>
<td>Soc 110</td>
<td>(3)</td>
<td>Introduction to Sociology</td>
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<tr>
<td>Humanities Elective</td>
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<tr>
<td><strong>Junior Year</strong></td>
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<tr>
<td>Chem 240 &amp; 240L</td>
<td>(5)</td>
<td>Survey of Organic Chemistry and Laboratory</td>
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<tr>
<td>Cls 234</td>
<td>(1)</td>
<td>Human Parasitology</td>
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<tr>
<td>Cls 234L</td>
<td>(1)</td>
<td>Human Parasitology Lab</td>
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<tr>
<td>Cls 238</td>
<td>(2)</td>
<td>Computer &amp; Statistical Applications in Cls</td>
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<tr>
<td>Econ 201</td>
<td>(3)</td>
<td>Principles of Microeconomics</td>
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<tr>
<td>Humanities Elective</td>
<td>(3)</td>
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<tr>
<td><strong>Professional Year 01 (Junior)</strong></td>
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<tr>
<td>Cls 325</td>
<td>(3)</td>
<td>Hematology</td>
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<tr>
<td>Cls 325L</td>
<td>(2)</td>
<td>Hematology Laboratory</td>
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<tr>
<td>Cls 336</td>
<td>(1)</td>
<td>Laboratory Calculations</td>
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<tr>
<td>Mbio 202</td>
<td>(3)</td>
<td>Introduction to Medical Microbiology Lecture</td>
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<tr>
<td>Phil 310</td>
<td>(3)</td>
<td>Ethics</td>
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<td>Phy 301</td>
<td>(4)</td>
<td>Human Physiology</td>
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<tr>
<td><strong>Sophomore Year</strong></td>
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<tr>
<td>Bioch 303</td>
<td>(3)</td>
<td>Biochemistry</td>
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<tr>
<td>Bioch 305</td>
<td>(3)</td>
<td>Biochemistry Lab</td>
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<tr>
<td>Cls 301</td>
<td>(2)</td>
<td>Immunology</td>
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<tr>
<td>Cls 380</td>
<td>(1)</td>
<td>Professional Issues in CLS</td>
</tr>
<tr>
<td>Cls 393</td>
<td>(2)</td>
<td>Immunohematology/Immunology Laboratory</td>
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<tr>
<td>Cls 394</td>
<td>(2)</td>
<td>Medical Microbiology</td>
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<tr>
<td>Mgmt 300</td>
<td>(3)</td>
<td>Print of Management</td>
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<tr>
<td>or Mgmt 305</td>
<td>(3)</td>
<td>Managerial Concepts</td>
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<tr>
<td><strong>Professional Year 02 (Senior)</strong></td>
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<tr>
<td>Cls 470</td>
<td>(1)</td>
<td>Clinical Immunohematology I</td>
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<tr>
<td>Cls 471</td>
<td>(2)</td>
<td>Clinical Chemistry Theory</td>
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<tr>
<td>Cls 472</td>
<td>(1)</td>
<td>Clinical Laboratory I</td>
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<tr>
<td>Cls 473</td>
<td>(2)</td>
<td>Clinical Hemostasis</td>
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<tr>
<td>Cls 482</td>
<td>(2)</td>
<td>Clinical Microscopy &amp; Urinalysis</td>
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<tr>
<td>Cls 475</td>
<td>(1)</td>
<td>Clinical Body Fluids</td>
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<tr>
<td>Cls 477</td>
<td>(1)</td>
<td>Clinical Immunohematology Theory</td>
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<tr>
<td>Cls 478</td>
<td>(2)</td>
<td>Clinical Microbiology and Laboratory Theory</td>
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<tr>
<td>Cls 480</td>
<td>(2)</td>
<td>Clinical Immunohematology II</td>
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<tr>
<td>Cls 481</td>
<td>(3)</td>
<td>Clinical Chemistry I</td>
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<td>Cls 482</td>
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<td>Clinical Hemostasis</td>
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<td>Cls 483</td>
<td>(1)</td>
<td>Clinical Laboratory II</td>
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<tr>
<td>Cls 484</td>
<td>(2)</td>
<td>Clinical Microbiology</td>
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<tr>
<td>Cls 485</td>
<td>(1)</td>
<td>Clinical Laboratory III</td>
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<td>Cls 486</td>
<td>(1)</td>
<td>Clinical Immunology</td>
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<tr>
<td>Cls 487</td>
<td>(1)</td>
<td>Medical Mycology</td>
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<td>Cls 489</td>
<td>(1)</td>
<td>Medical Laboratory</td>
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<td>Cls 490</td>
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<td>Financial &amp; Quality Management of the Clinical Laboratory</td>
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<tr>
<td>Cls 491</td>
<td>(1)</td>
<td>Clinical Chemistry II</td>
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<tr>
<td>Cls 492</td>
<td>(2)</td>
<td>Clinical Immunohematology III</td>
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<tr>
<td>Cls 493</td>
<td>(3)</td>
<td>Clinical Hematology II</td>
</tr>
<tr>
<td>Cls 495</td>
<td>(2)</td>
<td>Clinical Microbiology II</td>
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</tbody>
</table>

Total Credits: 130

**Courses**

The Clinical Laboratory Science program is part of the Division of Medical Laboratory Sciences in the Pathology Department. The Pathology (Path) courses that are required for Clinical Laboratory Science majors are listed below.

1. Orientation to Medical Laboratory Science, 2 credits. Introduction to the role, ethics, conduct, certification, education, employment, and fundamental knowledge and skills related to medical laboratory science. F

2. Introduction to Clinical Laboratory Professions, 1 credit.

3. Human Parasitology, 1 credit. Prerequisite: Biol 101. Physiological aspects of human parasites, their symbiotic host parasite relationships and clinical diagnostic techniques. S

4. Human Parasitology Laboratory, 1 credit. Prerequisite: Biol 101. Laboratory methods for the identification and diagnosis of human parasites. S

5. 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

6. Special Topics in Clinical Laboratory Science, 1-13 credits. Clinical Laboratory Science majors only. Special topics in Clinical Laboratory Science will be presented F, SS

7. Immunology, 2 credits. Principles of clinical immunology focusing on the cellular and molecular nature of antigens and antibodies, the immune response, immunogenetics, and immune mediated disease. S


9. Hematology Laboratory, 2 credits. Corequisite: Path 325. Morphologic examination of blood and marrow and laboratory testing used in hemastological study. F

10. 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

11. Principles of 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

12. Immunohematology/Immunology Laboratory, 2 credits. Prerequisites: Biol 150 and 151. Corequisite: Path 392. Theory and practical application of laboratory investigations of immunology serology, and immunohematology. S

13. 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

14. Special Topics in Medical Technology, 1-9 credits Lecture, discussion, and readings on topics of current interest in the clinical laboratory sciences. S

15. Clinical Laboratory Science Professional Training, 1-13 credits. Clinical Laboratory Science majors only. The course presents clinical laboratory practice theory and application to the clinical setting. F

16. Clinical Laboratory Science Professional Training, 1-13 credits. Clinical Laboratory Science majors only. The course presents clinical laboratory practice theory and application to the clinical setting. F

17. Clinical Immunohematology, 1 credit. Practical application of modern transfusion techniques, component therapy, and quality assurance. SS

18. Clinical Chemistry Theory, 2 credits. Theories and principles of chemistry procedures includes topics in instrumentation, carbohydrates, proteins, lipids, enzymes, liver function, blood gases, electrolytes, renal function, endocrinology, TDM and toxicology. S

19. Clinical Laboratory I, 1 credit. Theory and practice of phlebotomy in the clinical setting, specimen processing, review of state and federal regulations, safety and biohazard compliance, interpersonal relationship skills. SS

20. 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

21. Clinical Microscopy & Urinalysis, 2 credits. Theory, techniques and practice of microscopy and urinalysis with emphasis on identification of elements in the sediment. SS

22. 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. SS
School of Communication
(Comm)

S. Rendahl (Interim Director), Fiodo, Ganje, Han Youn, Hikins, Holden, Kraidy, Rakow, Shafer, and Zacher

The School of Communication 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 90 semester credits outside the School. At least 65 of these credits must be in courses approved for the University’s general education requirements or offered by the traditional liberal arts departments.

Facilities and Special Programs. The School has computerized writing and graphics 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 School’s Communication Research Center conducts research on a variety of communication issues and problems.

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 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 sponsored by the School include chapters of the American Advertising Federation, the Public Relations Student Society of America, and the Society of Professional Journalists. Another program sponsored by 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 or minor through the School must formally apply for admission to major or minor status. This is usually done during the sophomore year. To be admitted, students must:

- Complete Comm 102 or 103 and Engl 110 with grades of C or better.
- Pass English Proficiency Test administered by the School.
- Have a 2.50 overall grade point average.
- Have earned at least 24 semester credits.
- Faculty adviser assigned.
- Plan of study.
- Apply for admitted major or minor status in the School.

Students are classified as Pre-Communication majors until they have completed these requirements. Additional information about the application process is available from the School.

Note: Pre-majors and majors must earn a grade of C or better in all courses taken to fulfill requirements toward the major and minor, and they must maintain an overall grade point average of 2.50 in order to be enrolled in any Communication course beyond Comm 102 and 103.

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 4 year institution) including:

I. General Education Requirements (see University GER listing). (Note: Communication Pre-majors, majors, and minors cannot count Communication courses toward these requirements.)

II. Liberal Arts Courses

Students must complete 90 credits of courses outside of the School, 65 of which must be in the following liberal arts areas: 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, Visual Arts, and Women Studies.

III. One of the following options:

A. Level IV proficiency in a second language (which requires completion of the courses numbered 202 in the student’s chosen language); OR
B. 20 additional credits (beyond the General Education Requirements) from two of the following areas: Arts and Humanities; Social Sciences; Mathematics, Science and Technology (12 of these credits must be in upper division courses.)

IV. Major Requirements

Required minimum of 35, maximum of 38 credits, including:

- Level A: 6 credits required

  Comm 102........Communication and the Human Community...........(3)
  Comm 103........Information,Technology and Social Change...........(3)

- Level B: 15-18 credits required, minimum of one course per 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 and Conference.........(3)
INFORMATION
Comm 200. Introduction to Media Writing (3)
Comm 244. Reporting and Feature Writing (3)
Comm 321. Advanced Journalistic Writing (3)
Comm 322. Editing (3)
Comm 352. Writing for Public Relations (3)
Comm 353. Writing for the Electronic Media (3)
Comm 366. Business and Professional Speaking (3)

TECHNOLOGY
Comm 204. Graphic Design (3)
Comm 226. Photo Imaging (3)
Comm 304. Electronic Editing (3)
Comm 305. Publications (3)
Comm 306. Advertising Media Planning (3)
Comm 307. Videography (3)
Comm 332. Fundamentals of Television Production (3)

• Level C: 12-15 credits required, minimum of one course per category*

COMMUNITY
Comm 300. Communication and Society (3)
Comm 301. Psychology of Communication (3)
Comm 310. Media and Diversity (3)
Comm 328. Community Journalism (3)
Comm 401. Organizational Communication (3)
Comm 402. International/Intercultural Communication (3)
Comm 403. Community Relations (3)
Comm 499. Special Topics (1-3)

INFORMATION
Comm 308. Argumentation (3)
Comm 313. Persuasion (3)
Comm 367. Classical and Modern Criticism (3)
Comm 404. Advertising and Society (3)
Comm 405. Social Implications of the Information Society (3)
Comm 410. Research Methods in Communication (3)
Comm 461. Political Communication (3)
Comm 499. Special Topics (1-3)

TECHNOLOGY
Comm 302. Popular Culture (3)
Comm 331. Survey of Broadcasting (3)
Comm 346. Media Consequences and Effects (3)
Comm 407. Communication Technologies and the Future (3)
Comm 412. Communication Law (3)
Comm 428. U.S. Media History (3)
Comm 499. Special Topics (1-3)

• Level D: 1-3 credits required, Pre-Reqs Level B or instructor consent*
Comm 329. Practicum (1-3)
Comm 394. Individual Projects, Readings (1-3)
Comm 397. Cooperative Education (1-3)
Comm 497. Internship (1-3)

• Level E: 1 credit required*
Comm 450. Senior Portfolio. (1)

*NOTE: Additional pre-requisites may apply to some courses. Check individual course descriptions.

MINOR IN COMMUNICATION
Required 24 credits:
• 6 credits in Level A (Comm 102 and 103)
• 3 credits in each category:
  Community, Information, Technology in Level B
• 3 credits in each category:
  Community, Information, Technology

Intervention or practicum courses will not count toward the minor. Minors must fulfill the admissions requirements of the School of Communication. They must also earn a grade of C or better in all courses taken in the School and must maintain an overall GPA of 2.50.

College of Education and Human Development

MINOR IN COMMUNICATION
24 credits required, including:
Comm 102. Communication in the Human Community (3)
Comm 110. Fundamentals of Public Speaking (3)
Comm 200. Introduction to Media Writing (3)

Choose one 3-credit course from:
Comm 301. Communication and Society (3)
Comm 310. Communication and Diversity (3)
Comm 412. Communication Law (3)
Comm 428. U.S. Media History (3)
Comm 461. Political Communication (3)

Other Requirements (12 credits):
Comm 212. Interpersonal Communication (3)
Comm 313. Persuasion (3)
Comm 365. Small Group Discussion and Conference (3)
Comm 402. Intercultural/International Communication (3)

Teacher Certification
Students seeking secondary teacher certification in the School of Communication must complete the Department of Teaching and Learning Requirements in Secondary Education (see Secondary Education listings). School of Communication majors seeking secondary certification must have an adviser both in Socomm and the Department of Teaching and Learning. Formal admission to Teacher Education is required and is normally sought while the student is enrolled in T&L 200 (see College of Education and Human Development listing). School of Communication students are required to take Comm 300 Communication and Society.

Courses

102. Communication and the Human Community, 3 credits. An introduction to the important concepts and principles of human communication, with a focus on how humans create meaningful worlds to live in through shared language, shared visual perception and interaction processes. Examination of the conflicts and opportunities that can result from communication differences within and among communities, with particular emphasis on gender, race and ethnicity, age, sexual orientation, class and physical ability. FS

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. FS

110. Fundamentals of Public Speaking, (CCN 3) 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 major or instructor consent. Keyboarding skills required. Introduction to writing in the various styles and forms required in journalism, advertising, broadcasting, public relations and speech communication. F

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. Prerequisite: Comm 201. Admitted major or instructor consent. An introduction to theory and practice of image-making for the media. Coverage of major structural theories including style, semiotics, and iconography in a historical, environmental and psychological context. Typography, corporate symbology, logos and spatial relationships are included. Emphasis on recognizing professional and cultural standards and conventions. Survey of critical and ethical thinking about visual decisions for communication professionals. F

212. Interpersonal Communication, (CCN) 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,SS

226. Photo Imaging, 3 credits. Introduction to the practice of photography. Film developing, print making, photographic composition. Emphasis on the purposes of photography. F

244. Reporting and Feature Writing, 3 credits. Prerequisite: Admitted major or instructor consent. Introduction to news gathering, judgment and writing. F

300. Communication and Society, 3 credits. Prerequisites: Admitted major 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 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. F

302. Popular Culture, 3 credits. Prerequisite: Admitted 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

304. Electronic Editing, 3 credits. Prerequisite: Admitted major or instructor consent. Introduction to the concepts, theories and practice of electronic editing. Topics include aesthetics, composition, lighting, use of color, connecting action, manipulating time, use of sound and types of editing schemata. Past, current and new editing theory and techniques will be discussed. Consideration of social impact and the ethical, cultural, legal and regulatory issues involved in editing. S
305. Publications. 3 credits. Prerequisite: Comm 204, admitted major, or instructor consent. 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 major or instructor consent. 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 budget 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

307. Videography. 3 credits. Prerequisite: Admitted major or instructor consent. Introduction to the concepts, theories and practice of electronic videography. Includes use of cameras to obtain images, aesthetics of videography, composition and lighting. Discussion of past, current and new video imaging technology and techniques. Includes the business of video production, personal and commercial video, and community videography. F

308. Argumentation. 3 credits. Prerequisites: Admitted major or consent of instructor. An introduction to the philosophical development of argument, basic components of argumentation, kinds of argument structures and practical application of argumentation. S

310. Media and Diversity. 3 credits. Prerequisites: Admitted major or instructor’s consent. Study of minority status within mass media organizations and in media content from historical, contemporary and speculative points of view. S

313. Persuasion, (CCN) 3 credits. Prerequisites: Admitted major or instructor consent. An examination of principles and practices of persuasion and its influence across communication contexts such as interpersonal, group, and mass communication. Emphasis will be placed on ethical standards and implication of persuasion and influence. S

321. Advanced Journalistic Writing. 3 credits. Prerequisite: Comm 200; admitted major or instructor consent. News coverage and writing techniques involving public and private sectors of contemporary society. S

322. Editing. 3 credits. Prerequisite: Comm 200; admitted major or instructor consent. Editing and headline writing, copy preparation and layout applicable to newspapers and other print media. S

328. Community Journalism. 3 credits. Admitted major or instructor consent. Considers the role that news media can play in enhancing community life. May focus on the role of the media in broadcasting journalism in Native American communities, on the role of weekly newspapers in small, rural towns or on broadcast and print media in cities. Includes an in-depth introduction to an assessment of efforts to determine how new forms of media should provide innovative service for communities. F

329. Practicum. 1-3 credits, repeatable to 8 credits. Prerequisite: Level B or instructor consent. Supervised and graded experiences offered in a variety of communicative contexts, including but not limited to, Studio One, Public Radio, Native Directions and communication campaigns. Experiences offered will vary. F, S

331. Survey of Broadcasting. 3 credits. Prerequisite: Admitted major or instructor consent. Examination of broadcasting with emphasis on basic technology, structure, and organization. Study will include the basic legal, social and artistic aspects of broadcasting as well as techniques and utilization of audience research. S

332. Television Studio Production. 3 credits. Prerequisite: Admitted major or instructor consent. Introduction to basic studio production. Emphasis on the function and operation of TV equipment, lighting, producing and directing, including crew management, program conception, writing, production and evaluation. F

341. Advertising Creative Strategy. 3 credits. Prerequisites: Comm 204 or instructor consent. Introduces students to ideas and their translation into words and images that inform and persuade. Emphasis is on the strategic approaches to creative decision-making across all media. Topics include the setting of objectives, selection of copy structure, demands of different media, design principles, layout, and story boards, and regulations affecting messages. F

352. Writing for Public Relations. 3 credits. Prerequisites: Comm 200; admitted major or instructor consent. Intensive practice in preparing the most common types of material used in public relations. Special emphasis on writing style and form, and effective media relations. F, S

353. Writing for the Electronic Media. 3 credits. Prerequisite: Comm 200, admitted major or instructor consent. Introduction to basic electronic writing. Topics include information gathering techniques, principles of writing for different electronic formats and the differences in writing for print versus electronic media. Consideration of ethical, cultural, legal and regulatory issues in constructing scripts. F

365. Small Group Discussion and Conference. 3 credits. A theory and performance course in which students learn discussion techniques and study small group communication in networks, roles and worknorms in task oriented and problem solving projects. S

366. Business and Professional Speaking. 3 credits. Prerequisite: Admitted major or instructor consent. Advanced study of rhetorical invention, disposition and style; and the application of those principles through preparation of business and professional speeches and speech manuscripts. F

367. Classical and Modern Criticism. 3 credits. Prerequisite: Admitted major or instructor consent. A study of the ancient to contemporary development of rhetorical critical standards and practices in public speaking and communication. F

394. Individual Projects and Readings. 1-3 credits (May be repeated up to 6 credits) * Prerequisite: Junior standing, School of Communication consent. Individual projects or directed study related to topics, issues or activities in the areas of journalism, speech or communication. F, S

397. Cooperative Education. 1-3 credits, repeatable to a total of 3 credits in Cooperative Education, Internship, or a combination of both. Prerequisite: Level B or instructor consent. A practical work practice 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

401. Organizational Communication. 3 credits. Prerequisite: Admitted major or instructor consent. Analysis of communication behavior in formally structured relationships as it relates to the organization and to individuals. Special attention given to organizational style, status, trust and conflict-management. Informal communication networks and rumor are studied. S

402. International/Intercultural Communication. 3 credits. Prerequisite: Admitted major or instructor consent. Examines the social, ethical and economic aspects of advertising. Attention is given to appraising the effects of advertising on the consumer and community. S

405. Social Implications of the Information Society. 3 credits. Prerequisites: Admitted majors or instructor consent. Considers and evaluates different perspectives on the information society, ranging from humanistic and Neomarxist critiques to the optimistic scenarios of some futurists. Examines the implications of new means of creating, storing, manipulating and disseminating information. Discussion of whether or not the potential benefits will be realized. F

406. Media Consequences and Effects. 3 credits. Prerequisites: Admitted major or instructor consent. Examines and evaluates the social, ethical and economic aspects of advertising. Attention is given to appraising the effects of advertising on the consumer and community. S

407. Communication Technologies and the Future. 3 credits. Prerequisites: Admitted major or instructor consent. Enables students to develop an in-depth understanding of new communication technologies and to explore their potential. Consideration of how media industries are being restructured, of the social consequences of new technological applications and of implications for the exercise of social power. S

410. Research Methods in Communication. 3 credits. Prerequisite: Admitted major or instructor consent. Introduction to methodologies of historical, descriptive, and experimental research with attention to interpreting research results, selecting research designs and conducting communication research projects. S

412. Communication Law. 3 credits. Prerequisite: Admitted major or instructor consent. Examination of philosophical and historical background, development and court interpretations of “speech-press” clause of First Amendment with attention to libel law, right to privacy, access to information and advertising and broadcast regulation. F

428. U.S. Media History. 3 credits. Prerequisite: Admitted major or instructor consent. Development and impact of the American news media in the context of the social, political, economic and intellectual history of the United States from colonial times to the present. Previous coursework in general American history helpful. S

458. Senior Portfolio. 1 credit. Prerequisite: Departmental approval. A review, synthesis, and demonstration of what has been learned in the communication major. Creation of an academic portfolio documenting achievement of the program’s goals for student learning. F, S

461. Political Communication. 3 credits. Prerequisite: Admitted major or instructor consent. Analysis of political campaigns: a study of leading speakers, their speeches and the impact these have on our political, social, legal, and religious life. The rhetoric of mass movements and power, protest, and conciliation are analyzed. F

479. Internship, 1-3 credits, repeatable to a total of 3 credits in Internship, Co-operative Education, or a combination of both. Prerequisite: Junior standing and instructor consent. Supervised experience in the mass media or related field consistent with student’s career objectives. Final report, employer’s evaluation and samples of work required. Formal application in advance of internship needs department approval. S-U grading only. F, S

499. Special Topics, 1-3 credits, repeatable to 6 * Prerequisite: Comm 102 or 103 or instructor consent. Selected topics in communication that allow students to study specific communication issues and/or topics that are not covered by regular department offerings. On demand.

*Communication majors may not exceed 38 credits in the major within the 125 credits for graduation.
Communication Sciences and Disorders
(CSD)

W. Swisher (Chair), Biberdorf, Chamberlain, Fire, Glick, Madden, Rami, and Schill

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 through its governance. This mission is directed at meeting the needs and interests of the University of North Dakota constituency.

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. The clinical practicum/research 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 remedial treatment of all types of speech handicaps, language disabilities, and hearing problems (including evaluations for hearing aid candidacy). Referrals to the Clinic may be made by anyone, and treatment is provided for individuals of all ages.

Majors

The undergraduate coursework in Communication Sciences and Disorders is grounded in the liberal arts education. The undergraduate degree is designed to prepare the student to become a lifelong learner, a critical thinker and problem solver.

The coursework is also designed to prepare the undergraduate major to pursue professional and graduate work, including a grade major degree in Speech-Language Pathology or Audiology. The graduate degree in the field of communication disorders is required to work in this profession.

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).

II. The Following Curriculum

A. Major Course Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSD 231</td>
<td>Anatomy &amp; Physiology of the Speech and Hearing Mechanism</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 235</td>
<td>Speech and Hearing Science</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 334</td>
<td>Language Development</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 335</td>
<td>Language Disorders</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 365**</td>
<td>Aging &amp; Communication Disorders</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 372**</td>
<td>Introduction to Audiology</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 373</td>
<td>Cleft Palate &amp; Other Orofacial Anomalies</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 412</td>
<td>Articulation &amp; Phonological Development &amp; Disorders</td>
<td>(4)</td>
</tr>
<tr>
<td>CSD 483</td>
<td>Clinical Tests &amp; Measures</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 484</td>
<td>Clinical Practicum I: Speech-Language Pathology</td>
<td>(2)</td>
</tr>
</tbody>
</table>

B. Major courses required for B.A., but recommended:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSD 232</td>
<td>Survey of Communication Disorders</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 496</td>
<td>Special Problems in Communication Disorders</td>
<td>(1-3)</td>
</tr>
<tr>
<td>Comm 301</td>
<td>Psychology of Communication</td>
<td>(3)</td>
</tr>
</tbody>
</table>

C. Courses required in other departments:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psyc 250</td>
<td>Developmental Psychology</td>
<td>(4)</td>
</tr>
<tr>
<td>Psyc 270</td>
<td>Abnormal Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 209</td>
<td>Introduction to Linguistics</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 103</td>
<td>College Algebra</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Total Credit Hours 125

Course in Multicultural Education, such as Anth 171, 375 and 379 or IS 121, 330 and 345, or Psyc 421, or T&L 433.

*Admission to this course will require an overall GPA of at least 2.50, a grade of C or better in any CSD course.

**A course in gerontology will be required of all undergraduate majors in CSD. The students may opt to take CSD 365 to satisfy this requirement or some other gerontology course offered through another department.

D. Teacher Certification

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 310</td>
<td>Intro to Early Childhood Education</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 311</td>
<td>Observation and Description of Young Children</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 313</td>
<td>Young Children Language and Thought</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 314</td>
<td>Social and Emotional Lives of Young Children</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 315</td>
<td>Education of the Exceptional Student</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 316</td>
<td>Introduction to the Emotionally Disturbed Child</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 317</td>
<td>Introduction to the Mentally Retarded</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 318</td>
<td>Introduction to Learning Disabilities</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 328</td>
<td>Survey of Children’s Literature</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 423</td>
<td>Assessment &amp; Program Planning for Special Needs Students</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 432</td>
<td>Classroom Management</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Total Credit Hours 10

The Professional Education sequence for future speech clinicians also includes:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 400*</td>
<td>Methods &amp; Materials: Communications Disorders</td>
<td>(3)</td>
</tr>
<tr>
<td>CSD 585</td>
<td>Practicum in the School Setting</td>
<td>(3)</td>
</tr>
</tbody>
</table>

*T&L 400 must be completed before taking CSD 585.

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. The grammar and vocabulary of ASL will be learned within the context of communicative activities. Topics relating to Deaf Culture will be discussed throughout the course. F

102. 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. S

201. 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. S

223. Phonetics. 3 credits. Introduction to Phonetics. Includes articulatory descriptions of the speech sounds of English and other language, the International Phonetic Alphabet, coarticulatory phenomena, suprasegmentals, phonological processes. Supervised practice in broad and narrow transcription of normal and disordered speech is provided. F
231. Anatomy and Physiology of the Speech and Hearing Mechanism. 4 credits. Structure and function of the mechanisms involved in breathing, phonation, respiration, articulation and hearing. F

232. Survey of Communication Disorders. 3 credits. Speech disorders: causes, symptoms, diagnosis and therapy of the common speech defects. F

235. Speech and Hearing Science. 3 credits. Prerequisite: CSD 231 and Math 103 or consent of instructor and CSD223. An introduction to the normal processes of speech, hearing and language through the study of basic speech and hearing science exploring the scientific investigation of the physiological and acoustical parameters of speech. S

334. Language Development. 3 credits. The nature and development of linguistic content, form, and use from birth to adulthood are studied relative to the development of communication and speech; relative to cognitive, social, and physical development; and relative to cultural diversity. F

335. Language Disorders. 3 credits. Prerequisite: CSD 334. The identification, causes, and remediation of disorders of linguistic content, form, and use are studied relative to cognitive, social and physical development and functioning and relative to cultural diversity. F

365. Aging and Communication Processes. 3 credits. An intensive study of the sociological, psychological, medical and educational aspects of adult development and aging as they relate to communication processes and communication disorders. F

382. Introduction to Practicum. 3 credits. An introduction to clinical case management with a focus on developing clinical skills. Also includes an orientation to the UND Speech, Language and Hearing Clinic. S

422. Neuroanatomy of Communication Disorders. 3 credits. Prerequisite: CSD 231. A study of the essential structures that form the basis for neuroanatomy, neurophysiology, neuropharmacology, and neurology, with a special section on disorders of speech and language. F

431. Introduction to Audiology. 3 credits. Prerequisites: CSD 231 and 235 and Math 103 or 104. Elementary structure and function of the hearing mechanism; basic psychophysical dimensions of the auditory mechanism; types of deficient hearing; pure tone threshold and screening audiometry. Students are required to do hearing testing to qualify for certification in speech and hearing. F

434. Aural Rehabilitation. 3 credits. Prerequisites: CSD 431, & 343 or consent of instructor. Principles, techniques and clinical practice in the diagnosis and rehabilitation of hearing disorders in children and adults; auditory training, speech reading and hearing conservation. S

437. Cleft Palate and Other Orofacial Anomalies. 3 credits. Prerequisites: CSD 231 or consent of instructor. Co-req. CSD 482. Communication disorders related to cleft palate and other defects of the speech mechanism. A consideration of etiology, incidence, and clinical management of resulting communication and related problems. S

482. Articulation and Phonological Development and Disorders. 4 credits. Prerequisite: CSD 231. Development, etiology, diagnoses and management of phonological and articulation disorders. F

483. Clinical Tests and Measures. 3 credits. Prerequisites: CSD 343 and CSD 353. Corequisite: CSD 482. This course provides a consideration of general principles of diagnostic test construction and validation of speech-language pathology. Further, it includes review, evaluation and administration of major tests and measures designed to diagnose speech and language pathologies. S


485. Clinical Practicum II. 2 credits. Prerequisites: CSD 382, CSD484. Continuation of the content introduced in CSD 484 with increased emphasis on the clinical process and clinical skills. Includes supervised observation of direct clinical intervention. F, S, S


497. Special Problems in Communication Disorders. 1-3 credits. Prerequisite: consent of instructor. An examination of special topics in Communication Disorders. On demand.

Computer Science (CSci)

T. O’Neill (Chair), Anderson, Jo, Marsh, Panda, Valeroso, and Wiggen

The department offers a Bachelor of Science with a Major in Computer Science 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 needed for students who intend to pursue graduate study or to seek employment involving technical or scientific applications of computing. The B.S. degree is accredited by the Computer Science Accreditation Commission (CSCAC) of the Computing Sciences Accreditation Board (CSAB), a specialized accrediting body recognized by the Council on Postsecondary Accreditation (COA) and the U.S. Department of Education.

The B.A. program has 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 seeking a broader liberal arts education.

A minor in computer science is available to students who choose to concentrate their studies in an affiliated area. In addition, several courses are offered to provide the necessary basic knowledge of computer technology and computer programming for those students wishing to use the computer as a tool for study and research in other disciplines.

College of Arts and Sciences

B.S. WITH MAJOR 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. College of Arts and Sciences Requirements. See College listing.

III. Courses from computer science as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSci 160</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CSci 161</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>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 351</td>
<td>Introduction to File Processing</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 451</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. CSci 260 and 397 may be applied toward this major in Computer Science, but only up to a combined maximum of 3 hours. CSci 399, 491, and 494 may be applied toward this major in Computer Science, but only up to a combined maximum of three hours.

IV. Courses from other departments as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>EE 201</td>
<td>Electrical Engineering Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>Math 208</td>
<td>Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>Math 165, 166*</td>
<td>Calculus I and II</td>
<td>8</td>
</tr>
<tr>
<td>Approved math elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approved probability/statistics elective</td>
<td></td>
<td></td>
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<tr>
<td>Approved 2-semester laboratory science sequence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 approved courses in science or quantitative methods</td>
<td>6-8</td>
<td></td>
</tr>
</tbody>
</table>

B.A. WITH MAJOR 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. College of Arts and Sciences Requirements. See College listing.

III. Courses from Computer Science as follows:

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>CSci 160</td>
<td>Computer Science I</td>
<td>4</td>
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<tr>
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</tr>
<tr>
<td>CSci 250</td>
<td>Assembly Language Programming</td>
<td>4</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 Electives*</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

*Electives may be selected from CSci 260 (at most 3 hours), CSci 289, CSci 297 (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
EE 202. Electrical Engineering Laboratory
Math 208. Discrete Mathematics
Math 165, 166. Calculus I & Calculus II
or
Math 146. Applied Calculus I

MINOR IN COMPUTER SCIENCE
Courses from Computer Science are as follows:
CSci 160. Computer Science I
CSci 161. Computer Science II
CSci 250. Assembly Language Programming
CSci electives*

*All 9 credits hours of Computer Science electives must be 200 level or above, and at least 3 credit hours must be 300 level or above.

Courses
101. Introduction to Computing, 3 credits. Recommended corequisite: 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

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

120. Computer Programming I (CCN) 3 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. F,S

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. Students may not take CSci 120 after successfully completing CSci 160 F,S

161. Computer Science II, 4 credits. Prerequisites: CSci 160 and Math 103. Concurrent enrollment in Math 208 is recommended. A broadening of foundations for computer science. Prerequisites advanced concepts in computer programming. Includes an introduction to data structures, analysis of algorithms, and the theory of computation. Includes laboratory. A student may not receive credit for both CSci 161 and CSci 170. F,S

170. Computer Programming II, (CCN) 3 credits. Prerequisite: CSci 120. Advanced techniques in computer programming using a high-level language. Topics include the use of recursion, pointers, and fundamental data structures in developing small to medium-scale programs. A student will not receive credit for both CSci 170 and CSci 161. Once a year.

242. Algorithms and Data Structures, 3 credits. Prerequisites: CSci 161 and Math 208. Abstract data types (ADTs) and alternatives for implementation of lists, arrays, sets, trees, and graphs. Dynamic and static data structures. Time and space analysis of algorithms for initializing, accessing, searching, sorting, and traversing. F,S

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 language. Includes laboratory. F,S

260. Advanced Programming Languages, 1-3 credits. Prerequisite: CSci 170 or CSci 161 or consent for a CSci 161 in a specific high-level language for students who are already proficient in programming in another high-level language. Course may be repeated for different languages. A maximum of 3 credits may apply to a Computer Science major. A student may not receive credit for both CSci 260 and a 100- level programming course in the same language. On demand.

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 issues faced by computer professionals. Topics covered include privacy, the nature of work, centralization versus decentralization and the need for human factors analysis in the development of a new computer system. F,S

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


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 techniques and artificial intelligence. Topics include problem solving par-
The masters 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 Millers 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, and statistics. Students are admitted once a year, with completed applications required by February 1 for admission for the following year.

Typically, 18 students are admitted each year from a pool of 35-55. The masters program requires completion of 48 semester credits, generally requires two years of full-time study, and includes a two semester supervised internship at an external agency.

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 Examinations, recommendations, and relevant experience. The program requires four years of full-time study at the post bachelors level or three years at the post masters 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. Four to six students are admitted each year. The application deadline is January 1st for admission for the following year.

Details of the masters and doctoral degree programs in the Department of Counseling may be found in the graduate section of this catalog. For more information, contact the Chairperson, Department of Counseling (701-777-2729).

Courses

101. Career Decision-making. 1 credit. The process of making career choices and decisions is explored through assessment, instruments, class activities, and assignments. Student interests, skills, and work values are explored and related to information about careers and job market trends. Recommended for students in the process of choosing an academic major. S-U grading only. F/S

MINOR IN CRIMINAL JUSTICE STUDIES

21 credits required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CJ 201</td>
<td>Introduction to Criminal Justice</td>
<td>3</td>
</tr>
<tr>
<td>CJ 300</td>
<td>Criminal Investigation</td>
<td>3</td>
</tr>
<tr>
<td>Soc 252</td>
<td>Criminology</td>
<td>3</td>
</tr>
<tr>
<td>Soc 253</td>
<td>Juvenile Delinquency</td>
<td>3</td>
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9 additional credits from:

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Anth 345</td>
<td>Forensic Science</td>
<td>3</td>
</tr>
<tr>
<td>CJ 330</td>
<td>Criminological Theory</td>
<td>3</td>
</tr>
<tr>
<td>CJ 350</td>
<td>Correctional Alternatives</td>
<td>3</td>
</tr>
<tr>
<td>CJ 351</td>
<td>Police Administration</td>
<td>3</td>
</tr>
<tr>
<td>CJ 352</td>
<td>Criminal Investigation</td>
<td>3</td>
</tr>
<tr>
<td>CJ 361</td>
<td>Victimology</td>
<td>3</td>
</tr>
<tr>
<td>CJ 401</td>
<td>Administration of Justice</td>
<td>3</td>
</tr>
<tr>
<td>CJ 452</td>
<td>Police Role in Society</td>
<td>3</td>
</tr>
<tr>
<td>Phil 412</td>
<td>Philosophy of Law</td>
<td>3</td>
</tr>
<tr>
<td>Pels 306</td>
<td>American Constitution—Civil Liberties</td>
<td>3</td>
</tr>
<tr>
<td>Soc 351</td>
<td>Corrections</td>
<td>3</td>
</tr>
</tbody>
</table>

201. Introduction to Criminal Justice. (CCN) 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. F/S

330. Criminological Theory. (CCN) 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 make the student understand how to read and evaluate the research of others. 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 dispositions. S
Cytotechnology

T. Weiland, M.D. (Medical Director)
K. Hoffman, SCT (Program Director)
K. Pederson, CT (Education Director)

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 1988 expanded from a four to a six-student program. Most recently awarded reaccreditation in 1998, 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 6 students per year. University commencement and program graduation both occur at the end of summer semester. 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, 8 of chemistry, and 3 of college mathematics.

School of Medicine and Health Sciences

B.S. IN CYTO TECHNOLOGY

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, 151/151L-General Biology I & II and Laboratories (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)
Biol 371-Anatomy and Adaptations Laboratory (2)
Biol 470-Biometry (3)

325, 325L-Hematology & Laboratory (5)

4 hours from:
MBio 202 + 202L-Introduction to Medical Microbiology and Laboratory (5)
MBio 302 + 302L-General Microbiology and Laboratory (4)

4 hours from:
Phys 301-Mechanics of Human Physiology (4)
Biol 442-Physiology of Organs and Systems (4)

8 hours from:
Chem 121, 121L-General Chemistry I and Laboratory (4)
Chem 122, 122L-General Chemistry II and Laboratory (4)
Chem 116-Introduction to Organic & Biochemistry (4)
Chem 240, 240L-Survey of Organic Chemistry and Laboratory (5)
BCh 301-Biochemistry Lecture. (3)

(Students who elect to take BCh 301 should NOT take Chem 116, but must take Chem 122 and 240.)

3 hours from:
Math 103-College Algebra. (3)
Math 104-Finite Mathematics. (3)

2 hours from:
CLS 490-Financial & Quality Management of the Clinical Laboratory. (2)
Mgmt 305-Managerial Concepts. (3)

4 hours from:
CSci 101-Introduction to Computers. (3)
CSci 120-Computer Programming I. (3)
CSci 170-Computer Programming II. (3)
Phys 211/211L-College Physics I and Laboratory. (4)
Phys 212/212L-College Physics II and Laboratory. (4)

III. Cytotechnology Program, professional phase: (Senior year, 12 months)
Path 401-Diagnostic Cytology I. (15)
Path 402-Diagnostic Cytology II. (15)
Path 403-Diagnostic Cytology III. (10)

The Cytotechnology Program is part of the Pathology (Path) department. The Pathology courses for Cytotechnology majors are listed below:

93
401. Diagnostic Cytology I. 15 credits. Full day, integrated lecture, tutorial, laboratory course introduces exfoliative cytopathology of the female genital tract. The student learns principles and microscopic skills involved in screening/diagnosing pap test samples in the medical laboratory. Prerequisites: 20 hours biologic sciences, 8 hours chemistry, 3 hours math; including Biology 101, 102, and 369; Anatomy 204 and departmental approval. S

402. Diagnostic Cytology II. 15 credits. Full day, integrated lecture, tutorial, laboratory course introduces cytopathology of major body organs. The student learns principles and microscopic skills involved in preparing/diagnosing body fluid and fine needle aspiration samples in the medical laboratory. Prerequisites: Path 401 and departmental approval. S

403. Diagnostic Cytology III. 10 credits. Full day, 12 week clinical practicum held at UND or at a clinical affiliate cytology laboratory. Course is centered on the reinforcement of principles and the practice of skills learned in Path 401 and Path 402. Prerequisite: Pathology 402 and departmental approval. SS

Economics (Econ)

P. O’Neill (Chair), Bagheri, Biederman, Blackwell, Flynn, Goenner, Quinn, Ramset, Smith, Snath, and Stradley

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: macro-economics (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 which 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.

College of Business and Public Administration

B.B.A. WITH MAJOR IN BUSINESS ECONOMICS

The major in Business Economics is offered through the College of Business and Public Administration. This program emphasizes the business firm — integrating economics with related areas in marketing, management, accounting, finance, and quantitative analysis. Students who complete a major in Business Economics possess a comprehensive background in the basic foundations of a business as well as the analytical skills in economics increasingly required to be successful in the business world at local, regional, national and international levels.

All B.B.A. candidates must fulfill the College of Business and Public Administration degree requirements.

Required 125 credits (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, see BPA listing and including:

Business Administration Requirements:

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Acc 200, 201</td>
<td>Elements of Accounting I &amp; II</td>
<td>(6)</td>
</tr>
<tr>
<td>Acc 315</td>
<td>Business in the Legal Environment</td>
<td>(3)</td>
</tr>
<tr>
<td>Ecls 217</td>
<td>Fundamentals of Management</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 104</td>
<td>Finite Mathematics</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 301</td>
<td>Production Management</td>
<td>(3)</td>
</tr>
<tr>
<td>Mgmt 475</td>
<td>Strategic Management</td>
<td>(3)</td>
</tr>
<tr>
<td>Mkct 305</td>
<td>Marketing Foundations</td>
<td>(3)</td>
</tr>
<tr>
<td>Poli 115</td>
<td>American Government I</td>
<td>(3)</td>
</tr>
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</table>

Elect one course from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Anth 171</td>
<td>Cultural Anthropology</td>
<td>(3)</td>
</tr>
<tr>
<td>Psych 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>

Required courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acc 218</td>
<td>Computer Applications in Business</td>
<td>(2)</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>Intro 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>Econ 308</td>
<td>Intermediate Microeconomic Theory</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 309</td>
<td>Intermediate Macroeconomic Theory &amp; Policy</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 400</td>
<td>History of Economic Thought</td>
<td>(3)</td>
</tr>
</tbody>
</table>

III. Required Economics courses (6 hours from the following):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 310</td>
<td>Intermediate Business and Economic Statistics</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 311</td>
<td>Business Cycles and Forecasting</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 370</td>
<td>Issues in Applied Microeconomics</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 380</td>
<td>Current Issues in Global Economics</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 409</td>
<td>Current Issues in Macroeconomic Policy</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 416</td>
<td>Mathematics for Economists</td>
<td>(3)</td>
</tr>
</tbody>
</table>

IV. Required Economic electives (choose at least 9 hours from the following):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>Econ 305</td>
<td>Principles of Banking</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 310</td>
<td>Intermediate Business and Economic Statistics</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 311*</td>
<td>Business Cycles and Forecasting</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 324</td>
<td>Public Finance</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 331</td>
<td>Comparative Economic Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 338</td>
<td>International Economics</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 341</td>
<td>Labor Economics and Labor Relations</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 355</td>
<td>Government Regulation of Business</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 395**</td>
<td>Special Topics in Economics</td>
<td>(1-3)</td>
</tr>
<tr>
<td>Econ 405</td>
<td>Bank Regulation</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 414</td>
<td>Mathematical Economics</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 416*</td>
<td>Mathematics for Economists</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 438</td>
<td>International Money and Finance</td>
<td>(3)</td>
</tr>
<tr>
<td>Econ 496**</td>
<td>Research in Economics</td>
<td>(1-3)</td>
</tr>
<tr>
<td>Econ 497**</td>
<td>Readings in Economics</td>
<td>(1-3)</td>
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<tr>
<td>Math 166</td>
<td>Calculus II</td>
<td>(4)</td>
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<tr>
<td>Math 265</td>
<td>Calculus III</td>
<td>(4)</td>
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<tr>
<td>Math 266</td>
<td>Elementary Differential Equations</td>
<td>(3)</td>
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<td>Math 352</td>
<td>Advanced Engineering Mathematics I</td>
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<td>Math 353</td>
<td>Advanced Engineering Mathematics II</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 421</td>
<td>Statistical Theory I</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 422</td>
<td>Statistical Theory II</td>
<td>(3)</td>
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</tbody>
</table>

*Students choosing Econ 310, 311, or 416 under III, may not take those courses under Part IV.

**No more than 6 hours of electives from Econ 395, 496, 497 may count toward the major requirements.
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).

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

<table>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Acct 200, 201</td>
<td>Elements of Accounting I &amp; II</td>
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<td>Acct 515</td>
<td>Business in the Legal Environment</td>
<td>3</td>
</tr>
<tr>
<td>Comm 100</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Fin 310</td>
<td>Principles of Finance</td>
<td>3</td>
</tr>
<tr>
<td>Bys 217</td>
<td>Fundamentals of Management</td>
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<td>Finite Mathematics</td>
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<td>Math 210</td>
<td>Applied Calculus</td>
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<td>Principles of Management</td>
<td>3</td>
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<td>Mgmt 303</td>
<td>Production Management</td>
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<td>Mgmt 475</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
<tr>
<td>Mkt 305</td>
<td>Marketing Foundations</td>
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</tr>
<tr>
<td>Pols 115</td>
<td>American Government I</td>
<td>3</td>
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Elect one course from the following:

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Anth 171</td>
<td>Introduction to Anthropology</td>
<td>3</td>
</tr>
<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>
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</table>

Required courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 218</td>
<td>Computer Applications in Business</td>
<td>2</td>
</tr>
<tr>
<td>Acct 301</td>
<td>Intermediate Accounting I</td>
<td>4</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>Econ 305</td>
<td>Principles of Banking</td>
<td>3</td>
</tr>
<tr>
<td>Econ 308</td>
<td>Intermediate Microeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>Econ 309</td>
<td>Intermediate Macroeconomic Theory and Policy</td>
<td>3</td>
</tr>
<tr>
<td>Econ 405</td>
<td>Bank Regulation</td>
<td>3</td>
</tr>
<tr>
<td>Econ 409</td>
<td>Current Issues in Macroeconomic Policy</td>
<td>3</td>
</tr>
<tr>
<td>Econ 438</td>
<td>International Money and Finance</td>
<td>3</td>
</tr>
<tr>
<td>Fin 460</td>
<td>Management of Financial Institutions</td>
<td>3</td>
</tr>
</tbody>
</table>

Required electives: a minimum of 3 hours from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>Acct 302</td>
<td>Intermediate Accounting II</td>
<td>4</td>
</tr>
<tr>
<td>Econ 310</td>
<td>Intermediate Business and Economic Statistics</td>
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</tr>
<tr>
<td>Econ 311</td>
<td>Business Cycles and Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>Econ 324</td>
<td>Public Finance</td>
<td>3</td>
</tr>
<tr>
<td>Econ 331</td>
<td>Comparative Economic Systems</td>
<td>3</td>
</tr>
<tr>
<td>Econ 338</td>
<td>International Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 341</td>
<td>Labor Economics and Labor Relations</td>
<td>3</td>
</tr>
<tr>
<td>Econ 355</td>
<td>Government Regulation of Business</td>
<td>3</td>
</tr>
<tr>
<td>Econ 370</td>
<td>Issues in Applied Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 380</td>
<td>Current Issues in Global Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 395**</td>
<td>Special Topics in Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>Econ 400</td>
<td>History of Economic Thought</td>
<td>3</td>
</tr>
<tr>
<td>Econ 414</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 416</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
<tr>
<td>Econ 496**</td>
<td>Research in Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>Econ 497**</td>
<td>Readings in Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>Fin 321</td>
<td>Real Estate Finance and Investment</td>
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</tr>
<tr>
<td>Fin 324</td>
<td>Real Estate Appraisal</td>
<td>3</td>
</tr>
</tbody>
</table>

** No more than 6 hours of electives from Econ 395, 496 and 497 may count toward the major requirements.

College of Arts and Sciences

The B.A. with major in economics is offered through the College of Arts and Sciences. This is a flexible program for students who wish to attain a comprehensive background in Economics and while allowing them the opportunity to expand into related disciplines such as Mathe-

matics, Statistics, Journalism and the Social Sciences. The major in Economics is excellent preparation for advanced graduate level study in Economics or law. 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.

B.A. WITH MAJOR IN ECONOMICS

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. All students must complete the following 36 credits:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 210</td>
<td>Introduction to Business &amp; Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 303</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>Econ 308</td>
<td>Intermediate Microeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>Econ 309</td>
<td>Intermediate Macroeconomic Theory &amp; Policy</td>
<td>3</td>
</tr>
<tr>
<td>Econ 400</td>
<td>History of Economic Thought</td>
<td>3</td>
</tr>
<tr>
<td>Econ 416</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
</tbody>
</table>

III. Required Economics courses (6 hours from the group below):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 310</td>
<td>Intermediate Business and Economic Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 311</td>
<td>Business Cycles and Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>Econ 370</td>
<td>Issues in Applied Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 380</td>
<td>Current Issues in Global Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 409</td>
<td>Current Issues in Macroeconomic Policy</td>
<td>3</td>
</tr>
<tr>
<td>Econ 416</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
</tbody>
</table>

IV. Required Economics electives (choose at least 9 hours from the following):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Econ 305</td>
<td>Principles of Banking</td>
<td>3</td>
</tr>
<tr>
<td>Econ 310*</td>
<td>Intermediate Business and Econ Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 311*</td>
<td>Business Cycles and Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>Econ 331</td>
<td>Comparative Economic Systems</td>
<td>3</td>
</tr>
<tr>
<td>Econ 338</td>
<td>International Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 341</td>
<td>Labor Economics and Labor Relations</td>
<td>3</td>
</tr>
<tr>
<td>Econ 355</td>
<td>Government Regulation of Business</td>
<td>3</td>
</tr>
<tr>
<td>Econ 395**</td>
<td>Special Topics in Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>Econ 405</td>
<td>Bank Regulation</td>
<td>3</td>
</tr>
<tr>
<td>Econ 414</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 416*</td>
<td>Mathematics for Economists</td>
<td>3</td>
</tr>
<tr>
<td>Econ 438</td>
<td>International Money and Finance</td>
<td>3</td>
</tr>
<tr>
<td>Econ 496**</td>
<td>Research in Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>Econ 497**</td>
<td>Readings in Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>Math 166</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>Math 265</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>Math 266</td>
<td>Elementary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>Math 352</td>
<td>Advanced Engineering Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>Math 353</td>
<td>Advanced Engineering Mathematics II</td>
<td>3</td>
</tr>
<tr>
<td>Math 421</td>
<td>Statistical Theory I</td>
<td>3</td>
</tr>
<tr>
<td>Math 422</td>
<td>Statistical Theory II</td>
<td>3</td>
</tr>
</tbody>
</table>

*Students choosing Econ 310, 311, 416 under III may not use these courses under IV.

**No more than 6 hours of electives from Econ 395, 496, 497 may count toward the major requirements.

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 20 credits including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 202</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 303</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>Econ 308</td>
<td>Intermediate Microeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>Econ 309</td>
<td>Intermediate Macroeconomic Theory &amp; Policy</td>
<td>3</td>
</tr>
<tr>
<td>Economics Electives</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Courses

105. Elements of Economics. (CCC) 3 credits. Survey of Economic principles for students planning no further formal study of Economics. Analysis of factors influencing aggregate levels of output, employment, and prices; introduction to U.S. monetary system; price determination and resource allocation under competitive and monopolistic conditions. Review of selected contemporary economic issues. (No credit if Economics 201-202, Principles of Microeconomics and Macroeconomics, have been completed or audited. Not available to students in the College of Business and Public Administration.) F,S

201. Principles of Microeconomics. (CCC) 3 credits. Open to freshmen. Pre- or cocorequisite: Math 103 or 104 or equivalent. Nature, method, and scope of Economic analysis: economic scarcity, resources, specialization and division of labor, supply and
infuences on wages and employment. Particular emphasis will be placed on the law of industrial relations, employment and income access, and the adjustment of labor dis-

355. Government Regulation of Business. 3 credits. Prerequisite: Econ 201 and 202. An exploration of the many ways that federal and state governments regulate busi-

ness activity. Government regulation falls into three broad areas: economic regulation; social regulation; antitrust law. 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

370. Issues in Applied Microeconomics. 3 credits. Prerequisite: Econ 201 and 202. This course covers 3-4 topics in applied microeconomics. The specific topics cov-

ered will vary depending upon the instructor. A sampling of potential topics include: the economics of baseball; the scope of the modern corporation; the economics of health care; environmental economics. On demand

380. Current Issues in Global Economics. 3 credits. Prerequisites: Econ 201 and Econ 202. This course covers issues relating to trade, foreign investment, trading blocs, exchange rate changes, development issues, external debt of developing countries, investment in infrastructure and education and health, as well as development vs. envi-

ronment (or sustainable development). The issues covered will vary from year to year. On demand.

395. Special Topics in Economics. 1-3 credits. Prerequisite: Econ 201 and Econ 202. Specific topics 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

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, Marxian, Socialist, Historical, Austrian, Neoclassical, Institutional, Keynesian, and Monetarist. The coverage includes value theory, income/expenditure the-

tory, growth/development theory, scientific method, scope and policy. S

405. Bank Regulation, 3 credits. Prerequisite: Econ 303. The regulations imposed upon the banking industry are examined at several levels: state, federal, and global. Both the historical development of banking regulation as well as current issues/controversies are discussed. In addition, the banker’s perspective of regulatory compliance is explored. 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 basic tools of macroeconomic policy — monetary policy and fiscal policy — are studied from histori-

cal, contemporary, and theoretical perspectives. Emphasis is placed on recent develop-

ments 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

414. Managerial Economics. 3 credits. Prerequisites: Econ 210, Math 146 or equivalent; Bys 217 or equivalent. A synthesis relating economic theory, statistics, and mathematics to pricing, output, and resource allocation decisions by business firms. F

416. Mathematics for Economists. 3 credits. Prerequisites: Econ 308 and 309; Math 146 or 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 func-

tions, 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

485. 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. F,SS


496. Research in Economics. 1-3 credits. Research work and use of original doc-

uments; collecting of material and preparing of special topics and bibliographies; famil-

iarizing the student with government publications and other material available for study of economic problems. F,SS

497. Readings in Economics. 1-3 credits. Extensive reading in the student’s field of specialization; conference arranged with the instructor; written reports to be submit-

ted. F,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 (SU 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 (SU grading). 2 credits. May be repeated.
495A. Special Problems (regular grading); 495R. Special Problems (SU 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 and maintaining a sense of the responsibilities of a successful residence hall environment and implications for job satisfaction and individual development. F,S

Electrical Engineering (EE)

Johnson (Chair), Heckmann, Khalilfa, Miles, Rada, Salehfar, Schultz, and Won

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 humanistic 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 is committed to fostering a close student-faculty educational environment which 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 students may select courses with a focus on a particular subject, or related subjects, in electrical engineering. These subjects include systems engineering, power systems planning and distribution, robotics, signal processing, computers, artificial intelligence, controls, and microwaves.

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 written/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 honor- 

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.

In addition to the traditional broad electrical engineering program, the department makes two focus areas available to students with interest in Aerospace or Computer Engineering. All three programs are listed below in their entirety, as follows:

School of Engineering and Mines

B.S. IN ELECTRICAL ENGINEERING

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>First Semester</th>
<th>Second Semester</th>
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</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>
</tr>
<tr>
<td>Engr 201</td>
<td>Statics</td>
<td>(3)</td>
</tr>
<tr>
<td>Chem 121</td>
<td>General Chemistry I</td>
<td>(3)</td>
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<tr>
<td>Chem 121L</td>
<td>General Chemistry Laboratory</td>
<td>(1)</td>
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<tr>
<td>Math 165, 166</td>
<td>Calculus I, II</td>
<td>(4)</td>
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<tr>
<td>Engl 110</td>
<td>Composition I</td>
<td>(3)</td>
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<tr>
<td>Econ 201</td>
<td>Principles of Microeconomics</td>
<td>(3)</td>
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<td>Arts and Humanities</td>
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Sophomore Year

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>EE 206</td>
<td>Circuit Analysis</td>
<td>(3)</td>
</tr>
<tr>
<td>EE304</td>
<td>Computer Aided Measurement and Controls</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 306, 307</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>EE 452</td>
<td>Microprocessor Hardware</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 265</td>
<td>Calculus III</td>
<td>(4)</td>
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<tr>
<td>Math 266</td>
<td>Elementary Differential Equations</td>
<td>(3)</td>
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<td>Phys 251, 252</td>
<td>University Physics I, II</td>
<td>(4)</td>
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<tr>
<td>Engl 125</td>
<td>Intro to Professional Writing</td>
<td>(3)</td>
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<tr>
<td>Engineering Science Elective**</td>
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</table>

Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 308</td>
<td>Electromastics Laboratory I</td>
<td>(2)</td>
</tr>
<tr>
<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>(4)</td>
</tr>
<tr>
<td>EE 318</td>
<td>Engineering Data Analysis</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 321</td>
<td>Electrons I</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 401</td>
<td>Electric Drives</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 403</td>
<td>Controls Laboratory</td>
<td>(1)</td>
</tr>
<tr>
<td>EE 405</td>
<td>Control Systems I</td>
<td>(3)</td>
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<td>EE 409</td>
<td>Distributed Networks</td>
<td>(2)</td>
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<tr>
<td>EE 421</td>
<td>Electrons II</td>
<td>(3)</td>
</tr>
<tr>
<td>EE 425</td>
<td>Electrons Laboratory II</td>
<td>(1)</td>
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<tr>
<td>Electrical Engineering Elective***</td>
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<td>(3)</td>
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<tr>
<td>Math Elective</td>
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<td>(3)</td>
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Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 480, 481</td>
<td>Senior Design I, II</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 253</td>
<td>University Physics III</td>
<td>(4)</td>
</tr>
<tr>
<td>Phil 370</td>
<td>Ethics in Engineering and Science</td>
<td>(3)</td>
</tr>
<tr>
<td>Electrical Engineering Elective****</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Technical Electives*****</td>
<td>(3)</td>
<td></td>
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<tr>
<td>Engineering Science Elective**</td>
<td>(3)</td>
<td></td>
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<tr>
<td>Social Science**</td>
<td>(3)</td>
<td></td>
</tr>
</tbody>
</table>

* May be waived for transfer students (substitute science credit required).
** Must include a World Cultures course (can be either AH & SS).
*** Engineering Science Electives: ME 301 (Materials Science), ME 306 (Fluid Mechanics), Engr 203 (Mechanics of Materials), Engr 202 (Dynamics), ME 341 (Thermodynamics).
**** Electrical Engineering Electives: Maximum of three credits of EE 490.
### B.S. IN ELECTRICAL ENGINEERING (with a Computer Science Focus)

(Requires Minors in both Computer Science and Mathematics)

Required 141 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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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>EE 101</td>
<td>Introduction to Electrical Engineering*</td>
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<tr>
<td>EE 201</td>
<td>Introduction to Digital Electronics</td>
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<tr>
<td>CSci 160</td>
<td>Computer Science I</td>
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<td>CSci 161</td>
<td>Computer Science II</td>
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<tr>
<td>Engr 201</td>
<td>Statics</td>
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<tr>
<td>Math 165</td>
<td>Calculus I, II</td>
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<tr>
<td>Chem 121</td>
<td>General Chemistry I</td>
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<td>Chem 121L</td>
<td>General Chemistry Laboratory</td>
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<tr>
<td>Phys 251</td>
<td>University Physics I</td>
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<tr>
<td>Engl 110</td>
<td>Compositio I</td>
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<td>Arts and Humanities **</td>
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#### Sophomore Year

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<th>Course Code</th>
<th>Course Title</th>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>EE 206</td>
<td>Circuit Analysis</td>
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<tr>
<td>EE 301</td>
<td>Computer Aided Measurement and Controls</td>
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<tr>
<td>EE 306, 307</td>
<td>Circuits Laboratory I, II</td>
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<tr>
<td>EE 313</td>
<td>Linear Electric Circuits</td>
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<tr>
<td>EE 452</td>
<td>Microprocessor I</td>
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<tr>
<td>(or) CSci 250</td>
<td>Assembly Language Programming</td>
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<tr>
<td>CSci 242</td>
<td>Data Structures</td>
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<tr>
<td>Math 208</td>
<td>Discrete Mathematics</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 252</td>
<td>University Physics II</td>
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<tr>
<td>Engl 125</td>
<td>Intro to Professional Writing</td>
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#### Junior Year

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<th>Course Title</th>
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<tbody>
<tr>
<td>EE 308</td>
<td>Electronics Laboratory I</td>
<td></td>
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<tr>
<td>EE 314</td>
<td>Signals and Systems</td>
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<tr>
<td>EE 318</td>
<td>Engineering Data Analysis</td>
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<tr>
<td>EE 452</td>
<td>Microprocessor I</td>
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<tr>
<td>(or) CSci 370</td>
<td>Computer Architecture</td>
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<tr>
<td>Ecom 201</td>
<td>Principles of Microeconomics</td>
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<td>Computer Science Electives**</td>
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<td></td>
<td>Math Elective</td>
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<td>Social Science **</td>
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#### Senior Year

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<th>Course Code</th>
<th>Course Title</th>
<th>First Semester</th>
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<tbody>
<tr>
<td>EE 403</td>
<td>Controls Lab</td>
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<tr>
<td>EE 405</td>
<td>Controls Systems I</td>
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<td>EE 409</td>
<td>Distributed Networks</td>
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<tr>
<td>EE 316</td>
<td>Electric &amp; Magnetic Fields</td>
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<tr>
<td>EE 480, 481</td>
<td>Senior Design I, II</td>
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<td>Phil 370</td>
<td>Ethics in Engineering and Science</td>
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<td></td>
<td>Electrical Engineering Elective</td>
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<td>Computer Science Elective**</td>
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<td>Technical Elective</td>
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<td>Engineering Science Elective</td>
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<td>Arts and Humanities**</td>
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<td>Social Science**</td>
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* May be waived for transfer students (substitute science credit required).

** Must include a World Cultures course (can be either A&H or SS).

*** Consent of academic adviser. Must be aerospace related.

### Courses

**101. Introduction to Electrical Engineering** 1 credit. An introduction to the electrical engineering discipline. Recent technologies and practices in electronics, computer, controls, power systems, robotics, communication, and microwaves. F

**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; Mathematical operations; Flip flops; Counters. 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** (CCN 2 credits). Prerequisite: Math 166. Co-requisite: Math 265. Introduces the foundations of electrical engineering, applying these concepts in digital electronics design and circuit theory. F-S

**304. Computer Aided Measurement and Controls** 3 credits. Prerequisite: 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 measurements and control algorithms. The software and concepts presented are evaluated in a laboratory environment. E

307. Circuits Laboratory II. 1 credit. Prerequisite: EE 306. Co-requisite: EE 313. Experimental circuit analysis and proper uses of laboratory equipment. S


313 Linear Electric Circuits, 3 credits. Prerequisite: EE 206*. Corequisites: Math 266 and Phys 252*. Linear electric circuits in the steady state and transient conditions; two-port circuits; Fourier Series single and polyphase systems. F,S

314. Signals and Systems, 3 credits. Prerequisites: EE 313*, Math 266, and Phys 252*. Passive filters, Laplace transform applications; Fourier transform; Z-transform; Nyquist sampling theorem; other topics as time permits (state variables; introduction to control and communications theory; discrete Fourier transform). S

316. Electric and Magnetic Fields, 4 credits. Prerequisites: Math 266 and Physics 252*. Field produced by simple distributions of electric charges and magnetic poles, field mapping and application to engineering problems. F

318. Engineering Data Analysis, 3 credits. Prerequisite: EE 313. This course will provide undergraduate electrical engineering students with an understanding of the principles of electrical 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


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 among student, department and employer. F,S,SS

401. Electric Drives. 3 credits. Prerequisite: EE 314, EE 316, and EE 321. A study of electric drives and their electronic controls, to include relevant power electronic techniques, computer simulation, and laboratory implementation. S

402. Design of Electrical Apparatus. 3 credits. Prerequisite: EE 401. Analysis and design of relays, transformers, and single phase induction motors, interaction of magnetic circuits and electrical circuits and effects of each on the other. On demand.

403. Controls Laboratory. 1 credit. Corequisite: EE 405. Hands-on experience in electric machines, energy conversion, system analysis, and design. S

405. Control Systems I. 3 credits. Prerequisite: EE 314. Dynamic response and modeling of linear control systems; stability analysis; design of controllers using frequency domain technique. S

409. Distributed Networks. 2 credits. Prerequisites: EE 313 and 316. Fundamentals of communication transmission lines. S

411. Communications Engineering, 3 credits. Prerequisites: EE 314. Mathematical definition of random and deterministic signals and a study of various modulation systems. On demand.

421. Electronics II. 3 credits. Prerequisite: EE 314 and 321. Analysis of electronic devices, including power amplifiers, pulse and digital circuits. S


424. Electronic Circuits. 3 credits. Prerequisite: EE 421. Principles, applications, and design of electronic equipment studied from viewpoint of complete systems. On demand.

425. Electronics Laboratory II. 1 credit. Co-requisite: EE 421. Laboratory work to parallel the material of Electrical Engineering 421. S

428. Robotics Fundamentals. 3 credits. Prerequisite: EE 321 or consent of instructor. Fundamentals of industrial robots: configuration, programming, and control are addressed. Actuators, sensing devices, coordinates transformation and task planning are emphasized. The laboratory provides hands-on experience with numerical control and robotics control. 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 waves, analysis of microwave networks and components using scattering matrices, analysis of periodic structures, transmission and cavity type filters, high frequency effects, microwave oscillators, amplifiers, and microwave measurement techniques. On demand.

451. Computer Hardware Organization, 3 credits. Prerequisites: EE 201 and 206* or consent of instructor. The study of complete computer systems including digital hardware interconnections and organization and various operation and control methods necessary for realizing digital computers and analog systems. On demand.

452. Microprocessor Hardware. 3 credits. Prerequisites: EE 201 or consent of instructor. The study of the interaction of microprocessor hardware with devices so that communication and control of the computer can be accomplished with external signals. On demand.


480. Senior Design I. 3 credits. Prerequisites: Three courses out of EE 401, 405, 409, 421, 452. EE elective or as specified in the focus programs. First course in the two-course capstone design experience for the electrical engineering undergraduate degree. Emphasizing design methodologies, systems engineering, teamwork, and oral/written interpersonal communications. Emphasis will be placed on oral presentation and written report generation with critique. The two course sequence, EE 480 and EE 481, will satisfy three credits of the GER Communication requirement. F,S


490. Electrical Engineering Problems. 1-9 credits. Repeatable to maximum of 9 credits. Prerequisite: Approval by departmental faculty member under whom the electrical engineering problem is studied. F,S

*Course must be completed with a “C” or better.

Courses

100. Professional Assessment and Evaluation. 1 credit. 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. (See ChE, EE/EnE curricula listings.)

101. Graphical Communication, (CCN) 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 team problem solving. F,S

200. Computer Applications in Engineering, (CCN) 2 credits. The fundamentals of digital computer programming are presented with special emphasis on a high-level language and engineering applications. The fundamentals of PC-based software applications and operating systems are also presented. F,S


203. Mechanics of Materials, (CCN) 3 credits. Prerequisite: Engr 201. Simple stress and strain, torsion, shear and bending moment, flexure and shear stresses in beams, combined stresses, deflections of beams, statically indeterminate members and columns. F,S

460. Engineering Economy, 3 credits. Prerequisite: Econ 201. Economic effects of engineering decisions involving time, value of money, economic balance, cost estimating and venture analysis. F,S,SS

English Language and Literature (Engl)

R. Lewis (Chair), Anderegg, Beard, Carson, Coleman, Dixon, Donaldson, Hampsten, Huang, Koprince, Marshall, McKenzie, J. Meek, M. Meek, O’Donnell, Rankin, J. Robison, L. Robison, and Wiener

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.

English 271 and 272 (3 hours each) are courses at the sophomore level recommended for English majors. The courses require a reasonable degree of ability to analyze orally and in writing a wide variety of literary
texts. These courses are introductory to all other literature courses. Students who become English majors after their sophomore year or after having taken 221, 222, and 224, or their equivalents, may substitute those courses with the approval of their advisers.

Other courses for the 36-hour English major must be approved by each student’s English Department adviser. Programs of study are intended to be tailored to each student’s needs and plans, and it is in recognition of a wide range of interests in literature and language that the student is required to work out the specific selection of courses with an adviser. At the same time, the Department recognizes the importance of breadth in English studies and therefore requires that the English major complete at least three credits in any five of six groups of courses: (1) historical period or survey courses, (2) major author courses, (3) genre courses, (4) thematic courses, (5) language and linguistic courses, and (6) writing courses. Students without a departmental adviser should see the Chair of the Department.

Students planning or considering graduate work in English are urged to take a balanced program of literature courses to include a range of genres, periods, and major-author courses. They are further urged to continue their study of foreign languages beyond the minimum required for the undergraduate major, and to consult graduate catalogs for stipulations of undergraduate requirements.

Students concentrating in language and linguistics will ordinarily take much of their course work in area 5. They will also note these related courses taught during the summer: Linguistics 450, Articulatory Phonetics; Ling. 452, Syntax and Morphology I; Ling. 470, Introduction to Sociolinguistics; Ling. 480, Second Language Acquisition Theory and Practice. Linguistics courses with prerequisites of other linguistic courses are Ling. 451, Phonology I, and Ling. 460, Ethnographic Methods in Field Linguistics. A maximum of 10 credits of these Summer Institute of Linguistics courses may be applied to the English major. Students are urged to take more than one foreign language if they are considering graduate work in languages and linguistics.

The following is a listing of courses grouped in categories to fulfill distribution requirements for the major. At least 3 credits must be taken in each of five of the following six categories. A minimum of 2 credits is acceptable in category six.

1. Historical period or survey courses, including:
   241, 242 World Literature I & II
   255 Native American Literature (when applicable and approved)
   299 Special Topics (when applicable and approved), e.g., The Twenties
   301, 302 Survey of English Literature
   303, 304 Survey of American Literature
   357 Women Writers and Readers (when applicable and approved)
   365 Black American Writers (when applicable and approved)
   369 Literature and Culture
   401 Studies in Medieval Literature
   402 Studies in Early Renaissance Literature
   403 Studies in Colonial American Literature
   404 Studies in Late Renaissance Literature
   405 Studies in Restoration and Eighteenth Century (English) Literature
   406 Studies in Nineteenth Century Literature
   407 Studies in Twentieth Century Literature
   415 Special Topics in Literature (when applicable and approved), e.g., Nineteenth Century American Humor, Restoration Satire, Modern Canadian Literature

2. Major author courses, including:
   299 Special Topics (when applicable and approved)
   315, 316 Shakespeare
   415 Special Topics in Literature (when applicable and approved), e.g., Keats, Melville, Dickinson, Faulkner

3. Generic courses, including:
   221 Introduction to Drama
   222 Introduction to Poetry
   224 Introduction to Fiction
   225 Introduction to Film
   265 Native American Literature (when applicable and approved)
   299 Special Topics (when applicable and approved), e.g., The Modern Short Story
   320 Studies in American Fiction
   321 Studies in American Poetry
   322 Studies in American Drama
   330 Studies in English Fiction
   331 Studies in English Poetry
   332 Studies in English Drama
   357 Women Writers and Readers (when applicable and approved)

359 Young Adult Literature
365 Black American Writers (when applicable and approved)
369 Literature and Culture (when applicable and approved)
409 Art of Cinematic Drama
415 Special Topics in Literature (when applicable and approved), e.g., Modern European Drama, Russian Fiction, Twentieth Century Lyric Poetry

4. Thematic courses, including:
   299 Special Topics (when applicable and approved), e.g., The Literature of the Sea, The Faust Legend in Modern Literature
   357 Women Writers and Readers (when applicable and approved)
   359 Young Adult Literature
   365 Black American Writers (when applicable and approved)
   415 Special Topics in Literature (when applicable and approved), e.g., Literature and Psychology, Literature of Courtly Love, Literature of Empire

5. Language and Linguistics courses, including:
   161, 162 American Indian Languages I and II
   209 Introduction to Linguistics
   299 Special Topics (when applicable and approved)
   309 Modern Grammar
   370 Language and Culture
   417 Special Topics in Language, e.g., Transformational Grammar, Classical Rhetoric
   419 Teaching English as a Second Language
   442 History of the English Language

6. Writing courses, including:
   308, 408 Advanced Composition I, II
   309 Creative Writing (the course may be repeated once for credit)
   411, 412 The Art of Writing (each course may be repeated once for credit)

College of Arts and Sciences

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 hours including 5-6 hours of introductory literature, preferably:
   Engl 271 ................. Literary Analysis I ......... ................. (3)
   Engl 272 ................. Literary Analysis II ......... ................. (3)

   English courses from the following categories—at least 3 hours from each of five of the six categories—as selected in consultation with major adviser:
   Twenty hours must be at the 300 and 400 level .......... ................. (30-31)

   Historical period or survey courses
   Major author courses
   Genre courses
   Thematic courses
   Language and Linguistics courses
   Writing courses
   Required in other departments:
   Level IV proficiency in a language other than English.

   Other courses: English majors are encouraged to explore other fields related to literature and language, notably: history, philosophy, art, history, theatre arts, speech, journalism, communication, radio-television, religious studies, and literary science.

B.A. WITH MAJOR IN ENGLISH

Teacher Certification

Students seeking secondary teacher certification in English must complete the following program:

The English major (described above), including level-four proficiency in a foreign language

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, 365, and 367.

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.

Admission to the Secondary Program, normally after taking T&L 200 (see College of Education and Human Development listing).

The Program in Secondary Education (see Secondary Education listings), to include:

T&L 400 Methods and Materials of Teaching Reading and Language (fall only)
T&L 400 Methods and Materials of Teaching Writing and Language (spring only)

A full semester T&L 487 (student teaching), normally taken during the semester of graduation.
English majors seeking secondary certification must have an advisor in both the English Department and the Department of Teaching of Learning.

MINOR IN ENGLISH

Required: 20 hours, including 5-6 hours of introductory literature, preferably
English 271, 272... (3)

Literary Analysis I (3)

English 272... (3)

Literary Analysis II

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. (CCN) 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. F,S

120. College Composition II. (CCN) 3 credits. Prerequisite: English 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. F,S

125. Technical and Business Writing. (CCN) 3 credits. Prerequisite: English 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. F,S

161. American Indian Languages I. 3 credits. Introductory study of one of the Native American languages of North Dakota. Repeatable for different languages. F,S

162. American Indian Languages II. 3 credits. Continuing introductory study of one of the Native American Languages of North Dakota; repeatable for different languages. S

209. Introduction to Linguistics. 3 credits. An introduction to the nature of language, phonology, grammar, semantics, and historical, geographical, social, and developmental aspects of language. F,S

221. Introduction to Drama. (CNN) 2 credits. Drama studied as a literary type, for understanding and for critical appreciation. F,S

222. Introduction to Poetry. (CCN) 2 credits. Poetry studied as a literary type, for understanding and for critical appreciation. F,S

224. Introduction to Fiction. (CCN) 2 credits. Fiction studied as a literary type, for understanding and for critical appreciation. F,S

225. Introduction to Film. (CCN) 2 credits. The study of film drama, concentrating on appreciation and evaluation of motion pictures. F,S

241, 242. World Literature I & II. (CCN) 6 credits. Great literature of western Europe, or in the European tradition, studied with emphasis upon intellectual and cultural values. F,S

265. Native American Literature. (CCN) 3 credits. Writings by and about American Indians, studied for understanding and critical appreciation. F,S

271, 272. Literary Analysis I and II. (CCN) 3 credits each. Recommended for English majors. Prerequisite: English 120. Students read, write about and discuss significant literary texts in English. A critical introduction to advanced literature courses. F,S

299. Special Topics. (CCN) 1-4 credits. A course for advanced students on topics varying from term to term. F,S

301, 302. Survey of English Literature. 6 credits. English literature from its beginnings to the twentieth century. F,S

303, 304. Survey of American Literature. 6 credits. The literature of the United States from its beginnings to the twentieth century. F,S

305. Creative Writing. 2 credits. Imaginative writing of various types. The course may be repeated once for credit. F,S

308. Advanced Composition I. 3 credits. Prerequisite: English 120 or permission of department. Advanced writing. Emphasis on the rhetorical appeals 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. Prior course recommended: 224, 271 or 272. Repeatable when topics vary. F


322. Studies in American Drama. 3 credits. Prior course recommended: 224, 271 or 272. Repeatable when topics vary. S

330. Studies in English Fiction. 3 credits. Prior course recommended: 224, 271 or 272. Repeatable when topics vary. S

331. Studies in English Poetry. 3 credits. Prior course recommended: 224, 271 or 272. Repeatable when topics vary. S

332. Studies in English Drama. 3 credits. Prior course recommended: 224, 271 or 272. Repeatable when topics vary. F

357. Women Writers and Readers. 3 credits. Literature by and about women, examining the social, historical, and aesthetic significance of the works. Repeatable when topics vary. F,S

359. Young Adult Literature. 3 credits. The study of literature for and about young adults (from the middle school through the high school years), examining the social, historical, and aesthetic significance of the works. S/2

365. Black American Writers. 3 credits. Writing by Black Americans studied for understanding and critical appreciation. S

369. Literature and Culture. 3 credits. Repeatable when topics vary. Prerequisite: 3 hours of English (excluding composition) or consent of the department. 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

394. Independent Study, (CCN) 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

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

401. Studies in Medieval Literature. 3 credits. A course in the literature of England in the medieval period. Repeatable when topics vary. F/2


403. Studies in Colonial American Literature. 3 credits. A course in the literature of America in the colonial period. Repeatable when topics vary. F/2

404. Studies in Late Renaissance Literature. 3 credits. A course in the literature of the English Renaissance, 1600-1660. Repeatable when topics vary. F/2, S/2


406. Studies in Nineteenth Century Literature. 3 credits. A course in literature in English of the 19th Century. Repeatable when topics vary. F,S


408. Advanced Composition II. 2 credits. Advanced writing. Emphasis on the conventions of particular kinds of writing such as research reporting, writing for teachers, and article writing. English 308 recommended before English 408. F

409. Art of the Cinema. 3 credits. Prerequisite: English 225. An investigation of the esthetics 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

411, 412. The Art of Writing. 6 credits. Prerequisite: English 305 or consent of instructor. Writing of various types, with emphasis upon a critical and professional approach. Genres vary with instructor. Each course may be repeated once for credit. F,S

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

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/2

422. 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

Entrepreneurship (ENTR)

W. Dougan (Director)

Entrepreneurship is a multidisciplinary and interdivisional 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, industrial technology, information systems business education, offer various courses and programs for both business and non-business majors. The College offers a five course entrepreneurship track for non-business majors and a three course entrepreneurship track for business majors. The Entrepreneurship Studies Track will be especially helpful to those non-business majors who expect to carry out business and administrative functions in their chosen field.
The track will provide these students with skill sets that will enhance their career qualifications regardless of major. 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) and including:

Pre-Business Core (Required 34 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accr 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 Economics Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ISys 217</td>
<td>Fundamentals of Management</td>
<td>3</td>
</tr>
<tr>
<td>Math 104, 146</td>
<td>Finite Mathematics, Applied Calculus I</td>
<td>6</td>
</tr>
<tr>
<td>Pols 115</td>
<td>American Government I</td>
<td>3</td>
</tr>
<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking</td>
<td>3</td>
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</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     |

Business Core (Required 21 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>Mgmt 300</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>Econ 303</td>
<td>Money and Banking</td>
<td>3</td>
</tr>
<tr>
<td>Accr 315</td>
<td>Business in the Legal Environment</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 301</td>
<td>Production Management</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 474</td>
<td>Strategic Management</td>
<td>3</td>
</tr>
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</table>

Courses required for Entrepreneurship Major (Required 27 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>Entr 385</td>
<td>Venture Initiation</td>
<td>3</td>
</tr>
<tr>
<td>Entr 387</td>
<td>Venture Growth</td>
<td>3</td>
</tr>
<tr>
<td>Entr 397</td>
<td>Entrepreneurship Internship</td>
<td>3</td>
</tr>
<tr>
<td>Entr 405</td>
<td>New Product Development</td>
<td>3</td>
</tr>
<tr>
<td>Entr 410</td>
<td>Entrepreneurial Finance</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 311</td>
<td>Personal Selling</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 320</td>
<td>Marketing Research I</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 320</td>
<td>Marketing Research II</td>
<td>3</td>
</tr>
<tr>
<td>Mgmt 302</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
</tbody>
</table>

TRACKS

Entrepreneurship Track for Non-Business Majors

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entr 201</td>
<td>The Entrepreneur and the Economy</td>
<td>3</td>
</tr>
<tr>
<td>Entr 301</td>
<td>Accounting and Financial Concepts for Entrepreneurs</td>
<td>3</td>
</tr>
<tr>
<td>Entr 302</td>
<td>Marketing and Management Concepts for Entrepreneurs</td>
<td>3</td>
</tr>
<tr>
<td>Entr 385</td>
<td>Venture Initiation</td>
<td>3</td>
</tr>
<tr>
<td>Entr 387</td>
<td>Venture Growth</td>
<td>3</td>
</tr>
</tbody>
</table>

Entrepreneurship Track for Business Majors

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entr 385</td>
<td>Venture Initiation</td>
<td>3</td>
</tr>
<tr>
<td>Entr 387</td>
<td>Venture Growth</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses

201. The Entrepreneur and the Economy, 3 credits. This course is designed for students not enrolled in the College of Business and Public Administration who have an interest in business and the business world. This course introduces students to the basic characteristics of the world of business, including the political, social and economic system in which a business functions, the characteristics of a business, the creation of a business and issues dealing with the world of business. F,S

301. Accounting and Financial Concepts for Entrepreneurship, 3 credits. Prerequisite: Entr 201. The objective of this course is to develop an entrepreneurial understanding of the development and use of financial information. Topics include cash flows, the accounting cycle, financial statements, capital and master budgets, cost-volume-profit analysis, financial instruments, and risk and return issues, among others. S

302. Marketing and Management Concepts for Entrepreneurship, 3 credits. Prerequisite: Entr 201. This course is an introduction to the nature, significance and role of marketing and management in today’s society. The main objective is to explore business functions from both management and marketing perspectives. By combining the two disciplines, this course provides the prerequisite understanding needed by non-business undergraduate students pursuing further education in business. It will point out the skills that managers must apply to meet crucial goals. S

385. Venture Initiation, 3 credits. Prerequisites: Entr 201, 301, and 302 or Fin 310, Mgmt 300 and Mktg 305. This course is concerned with the issues surrounding the creation of a new economical entity. The focus of the course is the development of a venture plan. F,S

387. Venture Growth, 3 credits. Prerequisites: Entr 210, 301, and 302 or Fin 310, Mgmt 300, and Mktg 305. Corequisite: Entr 385. This course includes an overview of the issues faced by entrepreneurs in new ventures that have passed through an initial start-up phase and are now facing a growth or emerging phase and existing organizations attempting to become more entrepreneurial/intrapreneurial. This course focuses on applying general management and entrepreneurship principles to problems encountered by emerging ventures. Information gained from previous course-work, readings, class discussion, guest speakers, and research on entrepreneurs will be used to aid case study solutions. The course will combine individual activities and group work. F,S


405. New Product Development, 3 credits. Prerequisite: Entr 385. This course is concerned with the generation of product ideas and concepts and the design and development of products and services which meet market needs. Particular attention is paid to new product development as a multi-functional team effort. F,S

410. Entrepreneurial Finance, 3 credits. Prerequisites: Entr 385 and Fin 310. This course is concerned with the financial functions of a new or entrepreneurial venture. The primary focus is on the function of the financial plan in the overall venture plan as well as sources of venture capital and cash flow management. F,S

Family Medicine (FMed)

W. Mann (Chair), Baird, Billings, Burrell, Cariveau, Curley, Demers, Delorme, Duke, Emery, Greek, Halvorsen, Hartson, Kringle, Mattson, McBride, Mitchel, Murphy, Olson, Paine, Rudd, Rubbeck, Schauer, Smith, Tangedahl, 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 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 offered is accredited by the Committee for Accreditation of Allied Health Education Programs (CAAHEP).

School of Medicine

B.S. IN ATHLETIC TRAINING

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

1. 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 ............(3)

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

FMed 101..............Orientation to Athletic Training ............(1)

FMed 207..............Prevention and Care of Athletic Injuries .......(2)

FMed 207L..............Prevention and Care of Athletic Injuries Lab. .......(1)

At the time of application to the Athletic Training Program, the student must have completed or be enrolled in all of the above courses. In addition, the student must show proof of the First Aid and CPR certifications or enrollment in:

PEXS 310..............First Aid and CPR ............(2)

**Core Courses**

The following core courses are required for BS in Athletic Training:

**Chem 121, 121L........General Chemistry I/Laboratory ..........(4)**

Comm 110..............Fundamentals of Public Speaking ..........(3)

CSci 101 & 101L........Introduction to Computer Science and Laboratory ..........(4)

**Engl 110..............College Composition I ............(3)**

**Engl 120..............College Composition II ............(3)**

**or 205..............Medical Terminology ............(1)**

**Phys 161, 161L........Introductory College Physics I/Laboratory ..........(4)**

**Phys 162, 162L........Introductory College Physics II/Laboratory ..........(4)**

**Psy 111..............Introduction to Psychology ............(3)**

**Psy 241..............Statistics for Behavioral Science ..........(4)**

**Psy 250..............Developmental Psychology ..........(4)**

**Soc 110..............Introduction to Sociology ............(3)**

**Arts & Humanities Requirement ............(9)**

**Electives ............(13)**

**indicates course satisfies General Education Requirements.

**Professional Courses**

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

**Anat 204 & 204L........Anatomy for Paramedical Personnel and Lab ..........(5)**

FMed 208..............Procedures in Athletic Training ............(1)

FMed 208L..............Laboratory Procedures in Athletic Training ..........(1)

FMed 209..............Understanding Medicine ..........(3)

FMed 213..............Beginning Practicum ............(1)

FMed 312..............Medical Aspects of Sports ..........(2)

FMed 313..............Intermediate Practicum ..........(2)

FMed 320..............Athletic Training Modalities ..........(2)

FMed 321..............Athletic Training Rehabilitation Techniques ..........(2)

FMed 321L..............Laboratory Athletic Training Rehab. Tech ..........(1)

FMed 343..............Organizational Admin. in Athletic Training ..........(2)

FMed 413..............Advanced Practicum ..........(3)

FMed 481..............Athletic Injury Assessment ..........(4)

FMed 491..............Seminar in Athletic Training ..........(2)

FMed 497..............Internship in Athletic Training ..........(3)

NAD 240..............Fundamentals of Nutrition ..........(3)

PEXS 332..............Biomechanics ..........(4)

PEXS 402..............Exercise Physiology ..........(4)

PEXS 403..............Health Education ..........(2)

PhTx 410..............Drugs Subject to Abuse ..........(2)

Phy 301..............Human Physiology ..........(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. F.S

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

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

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

208. Procedures in Athletic Training. 1 credit. Prerequisites: FMed 207, 207L. An course serves as an orientation class for incoming sports health majors. Policies and procedures as well as record keeping are covered. F

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

213. Beginning Clinical Practicum in Athletic Training. 1 credit. Prerequisites: FMed 208, 208L. A clinical course designed to allow the student to develop specified clinical competencies in a directed, progressive manner. F

320. Athletic Training Modalities. 2 credits. Prerequisite: FMed 481. A course designed to present the theoretical and applied principles and techniques for the application of modalities in sports injury care. S

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

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

343. Organizational Administration of Athletic Training. 2 credits. Prerequisite: Senior standing or consent of the instructor. A course designed to acquaint students with the theories and principles of administrative. Administrative functions as they relate to the athletic trainer will be explained. S

413. Advanced Clinical Practicum in Athletic Training. 3 credits. Prerequisite: FMed 313. A clinical course designed to allow the students to develop specified clinical competencies in a directed progressive manner. S

481. Athletic Injury Assessment. 4 credits. Prerequisite: FMed 213. A course designed to instruct the students in the theories and skills of injury evaluation. F

491. Seminar in Athletic Training, (CCN) 2 credits, repeatable to 4 credits. Permission of instructor. Advanced work in athletic training to include surgical and conservative injury management, rehabilitation and injury. F.S

494. Directed Studies in Athletic Training, (CCN) 1-4 credits. (Repeatable to a maximum of 6 credits.) Prerequisite: Upper level status in athletic training or other allied health field, PT students, fourth year medical students, or instructor permission. An in-depth study in a subject area selected by the student under tutorial supervision. F.S

497. Internship in Athletic Training, (CCN) 3 credits. Prerequisite: FMed 313. Off campus athletic training experience designed to expose the student to alternate concepts of care. Repeatable up to 6 credits with instructor permission. F.S.SU

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**Finance (Fin)**

T. Nelson (Chair), Haskins, Kendig, Lee, and Potter

The Department of Finance offers a major in Financial Management, which covers the areas of managerial finance, investments, real estate, and insurance. The focus of managerial finance is internal to the enterprise with particular emphasis on problem-solving in small and medium sized firms and entrepreneurial enterprises. Portfolio and investment management courses analyze enterprises from the perspective of external investors who consider securities of enterprises for inclusion in portfolios. Real estate courses expand the scope of the program to include real property analysis and investments. Insurance courses expand the risk management function to include a variety of insurance contracts.

The Financial Management major has been designed to give students an appropriate balance between general background knowledge and particular decision-making skills. Foundation courses cover modern finance theory and modeling using information technologies and databases. Particular decision-making skills are developed through case analyses. Upon completion of the Financial Management major, students are prepared for careers as financial managers, investment analysts, real property analysts, financial planners and a variety of sales careers in firms marketing stocks, bonds, options, real estate and insurance.
### B.B.A. WITH MAJOR IN FINANCIAL MANAGEMENT

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

I. 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>Credits</th>
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<tr>
<td>First Semester</td>
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<tr>
<td>Engl 110</td>
<td>3</td>
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<tr>
<td>One of the Following:</td>
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<tr>
<td>Anth 171</td>
<td>3</td>
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<tr>
<td>Psych 111</td>
<td>3</td>
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<tr>
<td>Soc 110</td>
<td>3</td>
</tr>
<tr>
<td>Math 104</td>
<td>3</td>
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<tr>
<td>Pol 115</td>
<td>3</td>
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Second Semester

Comm 110   Fundamentals of Public Speaking   (3)
Engl 120 College Composition II   (3)
Engl 125 Technical and Business Writing   (3)
Math 146 Applied Calculus I   (3)

<table>
<thead>
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<th>Sophomore Year</th>
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<tr>
<td>First Semester</td>
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<tr>
<td>Acct 200 Elements of Accounting I   (3)</td>
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<tr>
<td>Acct 315 Business in the Legal Environment   (3)</td>
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<tr>
<td>Econ 201* Principles of Microeconomics   (3)</td>
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<tr>
<td>Econ 210* Introduction to Business and Economic Statistics   (3)</td>
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<tr>
<td>Engl 120 College Composition II   (3)</td>
<td></td>
</tr>
<tr>
<td>Engl 125 Technical and Business Writing   (3)</td>
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<tr>
<td>Math 146 Applied Calculus I   (3)</td>
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<th>Credits</th>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td>Acct 301* Intermediate Accounting I   (4)</td>
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<tr>
<td>Mgmt 300 Principles of Management   (3)</td>
<td></td>
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<tr>
<td>Mkt 305 Marketing Foundations   (3)</td>
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<tr>
<td>Fin 310* Principles of Financial Management   (3)</td>
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<tr>
<td>Fin 321 Real Estate Finance and Investment   (3)</td>
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Second Semester

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<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>Mgmt 301* Production Management   (3)</td>
</tr>
<tr>
<td>Fin 340* Intermediate Financial Management   (3)</td>
</tr>
<tr>
<td>Fin 350* Financial Data Inputs: Analysis and Interpretation   (3)</td>
</tr>
<tr>
<td>Fin 360 Capital Market Financing and Investment Strategies   (3)</td>
</tr>
<tr>
<td>Econ 303* Money and Banking   (3)</td>
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Second Semester

<table>
<thead>
<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>Fin 410* Cases in Managerial Finance   (3)</td>
</tr>
<tr>
<td>Fin 420* Investment Analysis and Portfolio Management   (3)</td>
</tr>
<tr>
<td>Mgmt 475* Strategic Management   (3)</td>
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<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Credits</th>
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<tbody>
<tr>
<td>First Semester</td>
<td></td>
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<tr>
<td>Fin 430* International Financial Management   (3)</td>
<td></td>
</tr>
<tr>
<td>Mgmt 475* Strategic Management   (3)</td>
<td></td>
</tr>
<tr>
<td>Elective in Financial Management Major   (3)</td>
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</tbody>
</table>

Courses

#### 220. Personal Investing, 3 credits.
Investment concepts for individual investors who are, or will be, actively developing and monitoring their own investment portfolios. Covers basic analysis techniques, investment vehicles, strategies for implementing investment goals in a portfolio context, risk-return tradeoffs, and sources of investment information. Not available to students who have successfully completed Fin 420 or its equivalent. F,S

#### 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, leasing, and property management. This is an elective available to all UND students. F,S

#### Badm. 251. Personal Financial Management, 3 credits.
The personal financial planning and management process: goal identification and budgeting; minimizing tax liability; uses and costs of various forms of credit; buying, selling and/or leasing real estate, automobiles and other major items; life, health, property and income insurance; various investment options; the retirement planning process; and estate planning options. The role of financial planning professionals and financial planning as a career option are also discussed. F,S

#### 321. Real Estate Finance and Investment, 3 credits.
Nature of real estate finance, financial sources, role of government, real estate financial instruments, loan processing, defaults and foreclosures in real estate finance, fundamentals of real estate investment analysis. F,S

#### 324. Real Estate Appraisal, 3 credits.
Nature of value; appraisal process; analysis of neighborhoods, land and improvements; cost, market data and income approach to value; appraisal report; code of ethics. F

Prerequisite: Fin 310. Restricted to Financial Management and Banking and Financial Economics majors. Integrated coverage of topics in finance theory. Includes capital asset pricing model, arbitrage pricing theory, option pricing model and futures market, capital structure theory, the signaling hypothesis, the agency problem, income measurement from the perspective of investors and financial managers. F,S

#### 350. Financial Information Systems, 3 credits.
Prerequisite: Acct 301, Fin 310. Restricted to Financial Management and Banking and Financial Economics majors. Interpretation and revision of financial statements to better reflect current economic status and performance of reporting entities. Includes use of financial databases and software, introduction to financial modeling. F,S

#### 360. Capital Market Financing and Investment Strategies, 3 credits.
Prerequisite: Fin 310. Covers analysis and procedures for implementing particular financing and investment plans in financial markets. Includes financing and investment through commercial banks, investment banks, pension funds, venture capital sources, insurance companies, limited partnerships. F,S

#### 380. Internship in Finance, 1-6 credits. Repeatable to 12 credits. Prerequisites: Acct 200, 201, Isys 217, Econ 201, 202, 210, and approval by division. Guided practical experience in managerial finance, investment management, real estate, and insurance with public and private sector enterprises. S/U grading only. F,S,S,S

#### 397. Cooperative Education, 1-6 credits. May be repeated to a total of 12 credits. Prerequisites: Acct 200, 201, Isys 217, Econ 201, 202, 210 and approval of Division Director. On-the-job compensated work experience in various areas of Finance. S/U grading only. F,S

#### 410. Cases in Managerial Finance, 3 credits.
Prerequisites: Fin 340, 350, 360. Senior standing. Introduces students to construction and utilization of financial management decision models using case study examples. Topics evaluated include working capital management, capital budgeting, cost of capital, capital structure, dividend policy, valuation, risk-return, and special topics of financial management. Students are required to develop original simulation models, prepare formal case reports, and orally and visually present their results. F,S

#### 420. Investment Analysis and Portfolio Management, 3 credits.
Prerequisites: Fin 340, 350, and 360. Comprehensive study of methods used to evaluate securities. Includes formulation of investment strategy and analysis, design of portfolios for classes of individual investors and institutions, fundamental analysis, portfolio performance evaluation. Extensive use of financial databases and software. F,S

#### 430. International Financial Management, 3 credits.
Prerequisites: Fin 310 and senior standing. Financial management implications of exchange risk exposure, accounting conventions, international constraints on capital flows. Other topics include multinational investment management and related financing problems, taxation, working capital management. F,S

#### 460. Managing Financial Institutions, 3 credits.
Prerequisite: Fin 310. Principles of asset/liability and portfolio management as they apply to the balance sheets and income statements of financial institutions. Includes management of assets and liabilities in the context of interest rate risk. Considers gap management, duration, financial futures, interest rate swaps, and securitization with the goal of profit maximization. F,S

#### 491. Senior Topics in Finance, 3 credits. Repeatable to 6 credits. Prerequisites: Fin 340 and Fin 350. Restricted to Financial Management and Banking and Financial Economics majors. Multiple sections covering different topics may be offered in any one semester. Designed for Financial Management majors. Provides opportunities for in-depth study beyond that of regularly scheduled courses. May be seminars, workshops, or lectures. F,S

#### 492. Readings and Research in Finance, 1-3 credits. Repeatable to 6 credits. Prerequisite: Fin 310 and approval by division. Designed for students with an interest in finance topics not covered in regularly scheduled courses. F,S
**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

495. Symposium in the Arts. 1-3 credits. Workshops and seminars in various specialized topics relating to the fine arts. Course varies with topic selected. May be repeated for credit up to 10 hours. On demand.

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**Forensic Science**

_The undergraduate major in Forensic Science is designed to provide students from varied backgrounds and academic interests with a curriculum in the general forensic sciences. This curriculum will serve as a preparation for a baccalaureate-level career in criminalistics and law enforcement or as preparation for post-graduate education in the forensic sciences._

**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:

- General Education Requirements (see University GER listing).
- The Following Curriculum:
  - 52 Major Credits including:
    - Required Courses (15 credits):
      - ANTH345 Forensic Science (3)
      - ANTH346 Analysis of Forensic Evidence (3)
      - CJ 210 Introduction to Policing (3)
      - CJ 352 Criminal Investigation (3)
      - CJ 353 Law for Criminal Justice System (3)
    - 3 credits from:
      - BIOL 470 Biometry (3)
      - SOC 326 Sociological Statistics (3)
    - 20 credits from:
      - BIOL 150/151 General Biology I & II (6)
      - BIOL 150L/151L General Biology I & II Lab (2)
      - CHEM 121/122 General Chemistry I & II (8)
      - PHYS 130/130L Natural Science — Physics (4)
    - 8 credits from:
      - CHEM 240 Survey of Organic Chemistry (4)
      - CHEM 330 Quantitative Analysis (4)
      - CHEM333 Introductory Environmental, Clinical, and Forensic Chemical Analysis (4)
  - ELECTIVES
    - 6 credits from:
      - ANTH 440 Forensic Anthropology (3)
      - BIOL 336 Systematic Botany (4)
      - BIOL 315 Genetics (3)
      - BIOL 363 Entomology (4)
      - CHEM 240 Survey of Organic Chemistry (4)
      - CHEM 330 Quantitative Analysis (4)
      - CHEM 333 Introductory Environmental, Clinical, and Forensic Chemical Analysis (4)

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**Geography**

_The Department of Geography offers major and minor programs in the College of Arts and Sciences. The Geography major can provide a traditional liberal arts education, or preparation for a career as a professional geographer. The principal programs of study include human geography, physical geography, regional geography, geographic education and geographic techniques. An undergraduate specialization in community and urban development can be designed, in consultation with an adviser, which provides the background education and training necessary for students to enter the field of rural and urban development. An undergraduate specialization in environmental geography can also be structured to prepare students for a career in environmental management. The undergraduate program is designed to provide either a broad liberal arts education, or to prepare students for doctoral 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 extremely flexible and can provide related preparation for students in anthropology, 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 and wet laboratory for work related to remote sensing, digital image processing, computer-assisted mapping, geographic information systems, air photo interpretation, quantitative methods, spatial analysis and field methods. It also maintains a Census Data Center and Climatic 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:

- General Education Requirements (see University GER listing).
- The following core curriculum courses for A, B, and C options (19 credits):
  - Geog 121/121L Global Physical Environment/Env Lab (4)
  - Geog 151 Human Geography (3)
  - Geog 161 World Regional Geography (3)
  - Geog 177/177L Quantitative Applications in Geography/Env Lab (3)
  - Geog 471/471L Cartography and Computer-Assisted Mapping/Env Lab (3)
  - Geog 474 Introduction to Geographic Information Systems (3)
III. Select one of the following options:

A: Liberal Arts Emphasis

This program provides a comprehensive background to geography. It is designed for those students who are undecided on a career specialization and are interested in a broad survey of the field of study. General Electives (17 credits):

Electives must include a maximum of one course from each of the disciplines of human geography, physical geography, regional geography, and geographic techniques.

B: 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 economic development, urban planning, transportation and tourism.

Electives systematic courses (9 credits) from:

- Geog 300 Special Topics in Geography (1-3)
- Geog 352 Economic Geography (3)
- Geog 354 Conservation of Resources (3)
- Geog 452 Selected Topics in Economic Geography (3-9)
- Geog 453 Historical Geography (3)
- Geog 455 Political Geography (3)
- Geog 457 Urban Geography and Planning (3)

Electives regional courses (at least 6 credits) from:

- Geog 262 Geography of North America I (3)
- Geog 263 Geography of North Dakota (3)
- Geog 362 Geography of Canada (3)
- Geog 462 Geography of North America II (3)
- Geog 363 Regional Geography: Middle East (3)
- Geog 463 Regional Geography: Europe (3)

Elective technical courses (3 credits) from:

- Geog 271 Map Use and Interpretation (3)
- Geog 300 Special Topics in Geography (1-3)
- Geog 374L Environmental Remote Sensing & Air Photo Interpretation (3)
- Geog 475 Digital Image Processing (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.

C: Environmental Geography Emphasis

This program provides an overview of geography as well as a thorough 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.

Elective systematic courses (at least 11 credits):

- Geog 134L Introduction to Global Climate/Lab (4)
- Geog 334/L Climatology/Lab (4)
- Geog 300 Special Topics in Geography (1-3)
- Geog 322 Natural Hazards (3)
- Geog 354 Conservation of Resources (3)
- Geog 421 Selected Topics in Physical Geography (1-3)

Elective technical courses (6 credits):

- Geog 271 Map Use and Interpretation (3)
- Geog 300 Special Topics in Geography (1-3)
- Geog 374L Environmental Remote Sensing & Air Photo Interpretation (3)
- Geog 475 Digital Image Processing (3)

Required in other departments (12 credits):

Any combination of courses from the following fields: Biology, Chemistry, Computer Science, Geology, Math, and Physics.

D: Geographic Education Emphasis

This program provides a comprehensive background to geography. It is designed to prepare the student with the geography education necessary for a secondary school teaching career.

Students seeking secondary certification in Geography must complete the Department of Teaching and Learning requirements in Secondary Education (see Secondary Education listing). Formal admission to Teacher Education is normally sought while enrolled in T&L 200. Geography majors seeking secondary certification must have an advisor in the Department of Geography and in the Department of Teaching and Learning.

Required (19 credits):

- Geog 121/121L Global Physical Environment/Lab (4)
- Geog 151 Human Geography (3)
- Geog 262 Geography of North America (3)
- Geog 271 Map Use and Interpretation (3)
- Geog 354 Conservation of Resources (3)
- Geog 419 Methods and Materials of Geographic Education (3)

Students must choose a minimum of 17 credits from a combination of the following concentrations, selected with approval of the geography advisor responsible for teacher education.

1. Human Geography:
   - Geog 300 Special Topics in Geography (1-3)
   - Geog 352 Economic Geography (3)
   - Geog 354 Conservation of Resources (3)
   - Geog 452 Selected Topics in Economic Geography (3-9)
   - Geog 453 Historical Geography (3)
   - Geog 455 Political Geography (3)
   - Geog 457 Urban Geography and Planning (3)

2. Physical Geography:
   - Geog 134/134L Introduction to Global Climate/Laboratory (3)
   - Geog 300 Special Topics in Geography (1-3)
   - Geog 322 Natural Hazards (3)
   - Geog 334 Climatology (4)
   - Geog 421 Selected Topics in Physical Geography (1-3)

3. Regional Geography:
   - Geog 262 Geography of North America I (3)
   - Geog 263 Geography of North Dakota (3)
   - Geog 362 Geography of Canada (3)
   - Geog 462 Geography of North America II (3)
   - Geog 463 Regional Geography: Middle East (3)
   - Geog 463 Regional Geography: Europe (3)

4. Geographical Techniques:
   - Geog 271 Map Use and Interpretation (3)
   - Geog 300 Special Topics in Geography (1-3)
   - Geog 374/374L Environmental Remote Sensing & Air Photo Interpretation (3)
   - Geog 471/471L Cartography and Computer-Assisted Mapping/Lab (3)
   - Geog 474 Introduction to GIS (3)
   - Geog 475 Digital Image Processing (3)

MINOR IN GEOGRAPHY

Required 20 credits including:

- Geog 121/121L Global Physical Environment/Lab (4)
- Geog 151 Human Geography (3)
- Geog 161 World Regional Geography (3)

Electives in Geography (10)

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 courses that may be used to satisfy the 9-credit General Education social science requirement include: Geography 151, 161, 262, 352, and 354.

121. Global Physical Environment, (CCN) 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, (CCN) 1 credit. A basic environmental laboratory to complement Geography 121. F.S.SS

134L. Introduction to Global Climate, (CCN) 3 credits with an optional 1 credit lab. An introduction to basic atmospheric processes, weather and climate elements, and basic climatic distribution. emphasis is placed upon the factors which control climate, and climatic distributions. F

134L. Introduction to Global Climate Laboratory, (CCN) 1 credit. Optional lab for geography 134. A basic physical science laboratory focused upon specific atmospheric-climatic phenomena; wet and dry lab experiments, plus written lab exercises. F

151. Human Geography, (CCN) 3 credits. A systematic analysis of people’s cultural regions including settlement patterns and change via migration and diffusion. F

161. World Regional Geography, (CCN) 3 credits. Development of the concept of region with analysis of the relationship of physical and cultural features to the contemporary world situation. F.S

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

263. Geography of North Dakota, (CCN) 3 credits. Study of the interactionships 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, (CCN) 3 credits. A systematic introduction to the grid, urban and rural land use, and the cartographic representation of the human landscape. F

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.SS
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

322. Natural Hazards. 3 credits. An overview of the field of natural hazards emphasizing hazard assessment, human vulnerability, and mitigation. F2

334. Climatology. 4 credits. Prerequisite: Geol 134 or Met 150. 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. S2

352. Economic Geography, (CCCN) 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, which have been, developed to explain 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,SS

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. Co-requisite: 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

397. Cooperative Education, 6 credits. May be repeated to a maximum of 6 credits. Prerequisites: Sophomore standing and a GPA of 2.75. A practical work experience with an employer closely associated with geography. S, U grading only. F,SS

419. Methods and Materials in Geographic Education, 3 credits. Prerequisite: admission to the professional program in teacher education in social studies. Corequisite: TEL 486 if majoring in secondary education as distinct from majoring in secondary education social studies. Various teaching methods and strategies and the materials used in teaching in the subject area of geography at the high school level. 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

452. Selected Topics in Economic Geography, 3 credits. Selected topics in economic geography including but not limited to industrial location, transportation, rural economic development, and others. Repeatable to nine credits if different titles are examined. S, F, S,S

453. Historical Geography, 3 credits. Using the spatial approach, landscape analysis is changed 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. S, 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

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

471T. 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, classing 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 competency 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). 3 credits. An introductory course which examines the nature of raster and vector data models and the analytical capabilities and products which they bring to bear on the solution of geographic problems. F

475. Digital Image Processing, 3 credits. Prerequisite: Geog 275. A course focused on the concepts and principles involved in the use of digital remotely sensed data as they are applied to environmental monitoring and natural resource management. Emphasis is placed on algorithm development and "hands-on" application of digital techniques to select imagery. 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, S,S

Geology and Geological Engineering (Geol and GeoE)
LeFever (Chair), Beaver, Forsman, Gerla, Ghasssemi, Gosnold, Groenewold, Hartman, Korom, Matheney, and Perkins

Our mission is to provide challenging programs in the geosciences adapted not only to the needs of undergraduate and graduate majors, but also non-majors seeking to gain a greater understanding of earth and planetary environments and resources. Our focus is on the geological interpretation and proper utilization of knowledge of materials, surface and internal features, dynamic processes, and developmental histories of Earth and other planetary bodies. Teaching and research are concentrated in the following areas: environmental studies, hydrogeology, geological engineering, sedimentary geology, field mapping, paleontology, surface processes, petrology, geochemistry, planetary geology, geophysics, and tectonics.

RESOURCES
The department is housed in Leonard Hall. Special facilities include the Water Quality Laboratory, Stable Isotope Geochemistry Laboratory, and microcomputer laboratory. The multidisciplinary Water Quality Laboratory is a joint endeavor linking several departments with interest in environmental and atmospheric studies. Our focus is on the geological interpretation and proper utilization of knowledge of materials, surface and internal features, dynamic processes, and developmental histories of Earth and other planetary bodies. Teaching and research are concentrated in the following areas: environmental studies, hydrogeology, geological engineering, sedimentary geology, field mapping, paleontology, surface processes, petrology, geochemistry, planetary geology, geophysics, and tectonics.
UNDERSGRADUATE 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 Geology and Technology 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:

Geol 101 & 101L Introduction to Geology and Laboratory (4)

Geol 102 & 102L The Earth Through Time Laboratory (4)

Geol 311 Geomorphology (4)

Geol 318 Mineralogy (3)

Geol 320 Petrology (3)

Geol 330 Structural Geology (3)

Geol 356 Geoscience Lectures (1)

Geol 411 Sedimentology & Stratigraphy (5)

Geol 420 The Evolving Earth (3)

Geol 421 Seminar I (1)

Geol 422 Seminar (1)

Geol 487 Research I (1)

Geol 488 Research II (2)

Geol 494 Senior Thesis (1)

Field Geology (Summer; not available at UND) (6)

Two courses from:

Geol 321 Geochemistry (3)

Geol 414 Applied Geophysics (3)

Geol 415 Invertebrate Paleontology (4)

Geol 417 Hydrogeology (3)

Required in other departments:

Chem 121, 121L General Chemistry I & II and Laboratories (8)

Engl 110 College Composition I (3)

Engr 200 Computer Applications in Engineering (2)

Math 165 & 166 Calculus I & II (8)

Phys 211/211L College Physics I, I and Laboratories (8)

One course from:

Math 265 Calculus III (4)

Math 321 Applied Statical Methods (3)

Psys 241 Introduction to Statistics (3)

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

*English 120 acceptable alternate course.

Teacher Certification

Students seeking secondary teacher certification in Geology must complete the Department of Teaching and Learning Requirements in Secondary Education on page 148. Students seeking certification should follow the curriculum for the B.S. in Geology and select Statistics (Psy 241, Math 321) rather than Math 265 or Computer Science. The 24 additional hours in science, computer science, statistics, engineering, mathematics, or a foreign language must include courses in Biology, Atmospheric Sciences, and Astronomy.

Geology majors seeking secondary certification must have an advisor both in the Department of Geology and Geological Engineering and in the Department of Teaching and Learning. Formal admission to Teacher Education is required and is normally sought while the student is enrolled in T&L 200 (see Department of Teaching and Learning listing).

B.A. WITH MAJOR IN GEOLOGY

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

I. General Education Requirements (see University GER listing).

II. The Following Curriculum:

40 major hours, including:

Geol 101 & 101L Introduction to Geology and Laboratory (4)

Geol 102 & 102L The Earth Through Time and Laboratory (4)

Geol 311 Geomorphology (4)

Geol 318 Mineralogy (3)

Geol 320 Petrology (3)

Geol 330 Structural Geology (3)

Geol 356 Geoscience Lectures (2)

Geol 420 The Evolving Earth (3)

Geol 422 Seminar (1)

Geology Electives (300 level and above) (13)

Required in other departments:

Computer Science and/or Statistics (8)

Chem 121, 121L General Chemistry I & II and Laboratories (8)

Math 103 College Algebra (3)

Math 105 Trigonometry (2)

Phys 211/211L College Physics I, I and Laboratories (8)

One of the following:

A. Level IV proficiency in a foreign language and 6 hours of Social Sciences and Arts and Humanities beyond the University requirement (22)

B. Level II proficiency in a foreign language and 14 hours of Social Sciences and Arts and Humanities beyond the University requirement (22)

C. Social Sciences and Arts and Humanities beyond the University requirement (22)

Nonspecified electives approved by adviser (7)

MINOR IN GEOLOGY

Required 20 credits including:

7-8 credits from:

Geol 101/101L Introduction to Geology and Laboratory (4)

Geol 203 Geology for Engineers (3)

Geol 102/102L The Earth Through Time and Laboratory (4)

6 credits from:

Geol 103 Introduction to Environmental Issues (3)

Geol 111 Views of the Earth and Planets (3)

Geol 311 Geomorphology (4)

Geol 322 Environmental Geology (3)

Remaining electives chosen from Geology courses numbered 214 or higher, not including 303 or 305

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:

Graduates must have the ability to identify and formulate engineering problems and design a system, component, or process to solve them. This requires that graduates be able to: (a) apply knowledge of mathe-
matics, science and engineering; (b) design and conduct experiments, as well as to analyze and interpret data; (c) use the techniques, skills, and modern engineering tools necessary for the engineering practice; and (d) understand professional and ethical responsibility.

In addition, the department recognizes that society’s problems are becoming increasingly complex and that their solution may require collaboration with experts in related disciplines. Therefore our graduates must be able to: (e) contribute effectively to multi-disciplinary teams; (f) communicate effectively, both orally and in writing; (g) understand contemporary issues, including the impact of engineering solutions in a societal and global context; and (h) engage in life-long learning.

B.S. IN GEOLOGICAL ENGINEERING

Required: 136 credits including:

I. General Education Requirements (see University GER listing).

II. The Following Curriculum:

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Math 165</td>
<td>Calculus I</td>
</tr>
<tr>
<td>Chem 121, 121L</td>
<td>General Chemistry I, Lab</td>
</tr>
<tr>
<td>Engr 101</td>
<td>Graphical Communication</td>
</tr>
<tr>
<td>Engr 110</td>
<td>Composition I</td>
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<tr>
<td>GeoE 203</td>
<td>Geology for Engineers</td>
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<tr>
<td>Geo 318</td>
<td>Mineralogy</td>
</tr>
<tr>
<td>Math 166</td>
<td>Calculus II</td>
</tr>
<tr>
<td>Chem 122, 122L</td>
<td>General Chemistry II, Lab</td>
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<tr>
<td>Phys 251/251L</td>
<td>University Physics I</td>
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<td>&amp;</td>
<td>Social Science</td>
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Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
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<tbody>
<tr>
<td>Math 265</td>
<td>Calculus III</td>
</tr>
<tr>
<td>Phys 252</td>
<td>University Physics II</td>
</tr>
<tr>
<td>Engr 200</td>
<td>Computer Applications in Engineering</td>
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<tr>
<td>Engr 201</td>
<td>Statics</td>
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<tr>
<td>Geo 320</td>
<td>Petrology</td>
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<tr>
<td>EE 206</td>
<td>Circuit Analysis</td>
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<tr>
<td>or</td>
<td>Geol 330</td>
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<td></td>
<td>Structural Geology</td>
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<tr>
<td></td>
<td>Arts and Humanities</td>
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<tr>
<td></td>
<td>Statistics Elective (Econ 210, Psy 241, or Math 321)</td>
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Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Math 266</td>
<td>Introduction to Differential Equations</td>
</tr>
<tr>
<td>Engr 203</td>
<td>Mechanics of Materials</td>
</tr>
<tr>
<td>ME 341</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>Geo 311</td>
<td>Geomorphology</td>
</tr>
<tr>
<td>Geo 411</td>
<td>Sedimentology &amp; Stratigraphy</td>
</tr>
<tr>
<td>CEn 412</td>
<td>Soil Mechanics</td>
</tr>
<tr>
<td>GeoE 323</td>
<td>Engineering Geology</td>
</tr>
<tr>
<td></td>
<td>Technical Elective*</td>
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<tr>
<td></td>
<td>Arts and Humanities</td>
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</tbody>
</table>

Summer

Field Geology (South Dakota School of Mines and Technology Black Hills Field Station)    (6)

Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Geol 414</td>
<td>Applied Geophysics</td>
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<tr>
<td>Phil 370</td>
<td>M Q &amp; P: Ethics in Engineering</td>
</tr>
<tr>
<td>GeoE 417</td>
<td>Hydrogeology</td>
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<tr>
<td>GeoE 455</td>
<td>Geomorphology</td>
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<td>GeoE 484</td>
<td>Geological Engineering Design</td>
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<td>Engr 460</td>
<td>Engineering Economy</td>
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<td>GeoE 485</td>
<td>Geological Engineering Design</td>
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<td></td>
<td>Technical Elective*</td>
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<td>Arts and Humanities</td>
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</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

41 major hours, including:

Geol 101, 101L      Introduction to Geology and Laboratory (4)
Geol 102, 102L      The Earth Through Time and Laboratory (4)
GeoE 220            Computer Applications in Geology and Environmental Science (2)
Geo 311             Geomorphology (4)
Geo 318             Mineralogy (3)
Geo 321             Geochemistry (3)
Geo 322             Geology, Society, and the Environment (3)
Geo 340             Digital Mapping Methods (3)
Geo 342             Environmental and Conservation Hydrology (3)
Geol 356             Geoscience Lectures (1)
Geo 410             Site Characterization (3)
Geo 414             Applied Geophysics (3)
Geo 421             Seminar I (1)
Geo 422             Seminar II (1)
Geo 487             Research I (1)
Geo 488             Research II (2)
Geo 494             Senior Thesis (1)

Required in Other Departments:

Biol 150, 150L      General Biology I, Laboratory (4)
Biol 151, 151L      General Biology II, Laboratory (4)
Biol 332, 332L      General Biology, Laboratory (4)
Chem 121, 121L      General Chemistry I, Laboratory (4)
Chem 122, 122L      General Chemistry II, Laboratory (4)
Math 165            Calculus I (4)
Math 166            Calculus II (4)
Math 166            Calculus II (4)
Chem 121, 121L      General Chemistry I, Laboratory (4)
Chem 122, 122L      General Chemistry II, Laboratory (4)
Math 165            Calculus I (4)
Math 166            Calculus II (4)
Chem 121, 121L      General Chemistry I, Laboratory (4)
Chem 122, 122L      General Chemistry II, Laboratory (4)
Phys 251, 251L      University Physics I, Laboratory (4)
Chem 121, 121L      General Chemistry I, Laboratory (4)
Chem 122, 122L      General Chemistry II, Laboratory (4)
Math 165            Calculus I (4)
Math 166            Calculus II (4)
Math 166            Calculus II (4)

Program Electives (three courses from following) (8-10 cr.):

Biol 431            Wildlife Management (3)
Biol 433            Aquatic Ecology (3)
Chem 333            Introductory Environmental, Clinical, and Forensic Chemical Analysis (4)
GeoE 417            Hydrogeology (3)
GeoE 418            Hydrogeological Methods (2)
GeoE 419            Groundwater Monitoring and Remediation (3)
Geog 475            Digital Image Processing (3)
Law 263            Environmental Law (3)
Spe 430            Earth System Science (3)

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.

100. Earth Science, 4 credits. The geologic aspects of earth science are featured. Geologic hazards, mineral and energy resources, and the significance of geology in the national parks and monuments are among the topics covered. This lecture-recitation course will fulfill part of the non-laboratory General Education Science requirement. F.S

101. Introduction to Geology, 3 credits. Introduction to the dynamics of the Earth—volcanoes, earthquakes, geologic and physical processes. Introduction to the industry, minerals, rocks, maps, aerial photographs, and satellite imagery. Geol 105 may be taken concurrently. F.S.S

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 101. An introductory laboratory to complement Geol 101. Field trip(s) included. F.S.S.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 the U.S. National Parks. Unifying geologic principles are emphasized. Major topics: sandstone, volcanic rock, hot springs and geothermal areas, caves and limestone formations, Hoodoos, and fossilized reefs, rivers and erosion, ice and glaciers, mountain building and mountain ranges. S

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.

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...-aciones del suelo, los planetas y el universo exterior, incluyendo los procesos geológicos y la formación de los continentes. Se incluyen laboratorios y proyectos de investigación. S, U grading. Prerequisite: Geology 100, 101, 102 or consent of instructor. Each topic is concerned with a special aspect of geology. May be repeated up to a maximum of 8 hours. F, S

311. Geomorphology. 4 credits. Prerequisites: Geology 101 and 102. Dynamics of weathering, mass movement, running water, groundwater, waves, wind and ice in the production of landforms. Includes field trips and laboratory. F

312. Environmental Geology, 3 credits. Prerequisite: Geology 318, Chem 106 and Math 212, or consent of instructor. Application of the principles of chemistry to geologic and hydrogeologic problems. Origin and distribution of the chemical elements. Introduction to radionuclides, isotopic geochemistry, and stable-isotope geochemistry. S

322. Environmental Geology, 3 credits. Prerequisite: One introductory geology course or upper division standing. Math 103 recommended. Relationship of geology to society, natural hazards, misuse and repair of our natural environment, application of geology to engineering, land planning, and resource management. S

323 (GeoE). Engineering Geology, 3 credits. Prerequisites: One introductory geology course, Math 211, 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. F

330. Structural Geology, 3 credits. Prerequisites: Geology 318, Geology 320, and Math 105. Mechanics of rock deformation, analysis of rock structures, preparation and interpretation of geologic maps and cross sections showing structural and tectonic features. Includes laboratory. S

340. Digital Mapping Methods, 3 credits. Prerequisites: Junior standing in Geology (12 hours). This course integrates “hands-on” data acquisitions and map generation with an overview of the technology (GPS, lasers, and data management). Field projects focus on mapping methodology and laboratory projects focus on analysis and presentation. It is assumed that students have an undergraduate geology background and a basic knowledge of computer applications. S

342. Environmental and Conservation Hydrology, 3 credits. Prerequisites: introductory geology course or upper division standing. Math 103. Topics relating hydrology to the environment and water conservation, including the global and local hydrological cycle, flood occurrence and prediction, water pollution, erosion and sedimentation, wetlands, and water management. S

351 (GeoE). Petroleum Development Engineering, 3 credits. Well spacing and location, drilling equipment and methods, fishing tools, casing, cementing, oil field hydrology, and well completion. F

356. Geoscience Lectures, 1 credit. Students attend and evaluate departmental lectures given by visiting scientists and engineers, faculty, and students. May be repeated once. S-U grading. May not be taken concurrently with Geol 422. F, S

397 (GeoE). Cooperative Education, 1-8 credits (repeatable to 24 credits). For qualified students majoring in geological engineering, geology, or environmental geology and technology. A practical work experience with an employer closely associated with the student’s academic area. Positions may require student relocation for one or more semesters. Aimed at external placement, supervised by a faculty member. S-U grading. Prerequisite: Geol 101 or Geol 203, and Geol 102. May be taken as a summer experience or in any other term during which the student is enrolled. S-U grading. Prerequisite: Geol 101 or Geol 203, and Geol 102. May be taken only with the approval of the departmental advisor. F

398. Research II, 2 credits. Prerequisite: Geol 487. Execution of research plan developed in Geol 488. F

404. Applied Geophysics, 3 credits. Prerequisites: Geology 101, Math 265, Phys 212 or 252. Principles of various geophysical methods and their application to geologic problems. F

415. Invertebrate Paleontology, 4 credits. Prerequisite: Geol 102. Recommended: Biol 150, 151. Major invertebrate groups preserved as fossils and their stratigraphic and paleoecologic use; invertebrate relationships; independent study of faunas. Includes field trip and laboratory. F

417 (GeoE). Hydrogeology, 3 credits. Prerequisite: Math 166 or consent of instructor. Physical and chemical aspects of groundwater movement, supply, and contamination. F

418 (GeoE). Hydrogeological Methods, 2 credits. Corequisite: Geol 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 212, GeoGe 417 and a statistics course (Econ 210, Psy 241, Math 321 or 353) or consent of instructor. Statistical methods for groundwater sampling and monitoring network design. Groundwater remediation and design, including strategies that remove contaminants for external treatment and strategies for in-situ contaminant treatment. S

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 concept. S

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 oral presentations in science and engineering, culminating in oral presentation of senior thesis (Geol 490) or Engineering Design (485). Includes critical review of student presentations and departmental guest lectures. F-S

422. Seminar II, 1 credit. Prerequisite: 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 (Geol 490) or Engineering Design (485). Includes critical review of student presentations and departmental guest lectures. F-S

425 (GeoE). Design Hydrology for Wetlands, 3 credits. Prerequisites: Chem 121 and either CE/ME 306 or GeoGe 417. Principles of chemistry, geology, hydraulics, and hydrology applied to natural and constructed wetlands and other small catchments. S

455 (GeoE). Geomechanics, 3 credits. Prerequisites: Geol 323 and CEn 412 or consent of instructor. Principles of geomechanics and its application to geological engineering. S

484 (GeoE). Geological Engineering Design, 3 credits. Prerequisites: Advanced level standing in Geological Engineering and consent of adviser. The first of a two-course sequence in geological engineering design. Define the design problem, establish design objectives, evaluate alternatives, specify constraints, determine a methodology, complete a formal design problem statement. F-S, S-S

485 (GeoE). Geological Engineering Design II, 4 credits. Prerequisite: Geol 484. Corequisite: Geol 422. Continuation of Geol 484 taken the preceding semester. Systematic study and design, with determination of feasibility, careful assessment of economic factors, safety, reliability, aesthetics, ethics, and social and environmental impact. Results presented in Geol 422 Seminar. F, S-S

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

488. Research II, 2 credits. Prerequisite: Geol 487. Execution of research plan developed in Geol 488. F

494. Senior Thesis, 3 credits. Prerequisite: Geol 488; corequisite: Geol 488. Original student investigation of geological problem. Supervised by a faculty adviser. Results presented as departmental seminar. F

499. Geologic Problems, 1-4 credits. Prerequisites: Consent of instructor. May be taken for one or two semesters. Offered at the discretion of the instructor, in consultation with the department and departmental advisor. F

499 (GeoE). Selected Topics on Mining, 1-3 credits (repeatable to maximum of 4 hours). Prerequisite: Geol 301. Detailed study of a selected topic related to mine planning or operations. Includes laboratory if applicable. On demand.

History
Hist

Berg, Burh, Clinkin, Ells, Ettling, Handy-Marchello, Iseminger, Mochoruk, Porter, and Reese

The History program at the University prepares one to understand oneself and one’s society, as well as other people in different cultures in the past and in the present. Beyond this the department trains students for the teaching of history at all levels, government service, and graduate studies in history. The study of history may serve as preprofessional training 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.

When taken in conjunction with the Teaching and Learning program in Secondary Education (see page 148), 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
35 major hours, including:
9 hours from: .........................................................(9)
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 240 ...................................... The Historian's Craft .......................... (3)
Hist 440 ...................................... Research .......................... (2)

Required in other departments:
Level IV proficiency in a foreign language.

Option B
35 major hours, including:
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 240 ...................................... The Historian's Craft .......................... (3)
Hist 440 ...................................... Research .......................... (2)

Required in other departments:
Level IV proficiency in a foreign language.

MINOR IN HISTORY

Required 20 credits, at least 6 must be in upper division courses, including:
9 hours from: .........................................................(9)
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)
History electives ..................................................(6)

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 330 ...................................... The United States: Social and Cultural 19th Century .......................... (3)
Phil 300 ...................................... Classical Greek and Hellenistic Philosophy .......................... (3)
Phil 301 ...................................... Medieval Period .......................... (3)
Phil 302 ...................................... Renaissance to Enlightenment .......................... (3)
Phil 303 ...................................... Kant and the Nineteenth Century Philosophy .......................... (3)
Phil 304 ...................................... Twentieth Century Philosophy .......................... (3)
Phil 309 ...................................... American Philosophy .......................... (3)
Art 210, 211 ...................................... Art History I & II .......................... (6)
Art 315 ...................................... American Art and Architecture .......................... (3)
Art 410 ...................................... History of Art: Selected Subjects .......................... (3)

Courses

101. Western Civilization I, (CCN) 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, (CCN) 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, 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 Times, 3 credits. A survey of the civilizations of the Eastern Mediterranean since the rise of Islam to the time of the formation of the present nation states. S/2

200. History through Biographies, 2 credits. (Repeatable, with different figures, to 6 credits.) The study of history through the lives and contributions of major leaders or figures. The nation, period or development, and persons involved will change each semester. S,F,S/2

203. Economic Development of the United States Since 1865, 3 credits. A survey of major developments in American economic growth. The first four weeks are devoted to the period before 1865; the remainder of the semester involves a more detailed study of events and changes. S/2

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. F/2

205. Canada Since 1867, 3 credits. A survey of Canadian history from Confederation to the present. Beginning with an overview of pre-Confederation Canada, this course will focus upon the cultural, economic, and political factors that have shaped Canada in the modern era. S/2

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

214. Latin America to 1825, 3 credits. An examination of the historical evolution of the American hemisphere from pre-Columbian times to the collapse of the Spanish Empire, including the rise of indigenous cultures and civilizations, Spanish and Portuguese intrusion and conquest, and the character of colonial rule. F/2

215. Latin America: The National Experience since 1825, 3 credits. A survey of the Spanish American republics and Brazil during the 19th and 20th centuries, with emphasis on the challenges of democratic leadership, economic dependency, social integration, and cultural pluralism. S/2

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/2

240. The Historian's Craft, 3 credits. An introduction to research and writing history. Students will learn critical reading of secondary sources, how to locate and evaluate resources, how to analyze evidence, how to apply the style and form of historical writing, and how to utilize methods of research. Students will also study historiography and types of historical writing and practice. F,S

269. World War II, (CCN) 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/2

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/2

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/2

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/2

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/2
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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/2

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. F/2

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/2

339. The United States and Vietnam, 1945-1975. 3 credits. An exploration of Southeast Asian as well as American history. This course will survey briefly the development of Vietnamese culture and nationalism, the history of French imperialism in Indochina as background to an examination of the development of the Vietnamese independence movement, the origins of Vietnamese communism, the war for independence from France, and the violent and tragic relationship between the U.S. and Vietnam from the end of World War II to the final departure of American forces from Saigon. S/2

340. The African Near East. 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 at the beginning of the Hellenistic era. Greek achievements in art, commerce, literature, politics, religion, science, and technology are surveyed. 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 Napoleon Era, 1790-1815. 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

353. 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

354. Europe Since 1918. 3 credits. A survey of European history from 1914 to the present, with emphasis on the issues, institutions, and problems confronting Europeans after the Great War. 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 revolution.

364. Modern Japan. 3 credits. A survey of the political, economic, social, and cultural transformation of Japan from the arrival of Commodore Perry in 1853 until recent times. Particular attention will be paid to modernization and its meaning for the Japanese people and to the international context of Japan’s military tragedy and economic success.

370. African-American History to 1877. 3 credits. This course begins with an examination of when and why the idea of race first developed; it then surveys colonial slavery, the impact of the American Revolution on race relations, and the slave community during the period of African slavery; it examines the lives of free blacks living 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 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. 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

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

403. The United States: The Colonial Period. 3 credits. A survey of the background of British colonization, the development of diverse colonial cultures, and the transformation in maturing provincial 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 underlying themes is long-range causes of American independence. F/2

404. The United States: Revolutionary 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, 1789-1855. 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 acceleration of the forces of sectionalism and racism that caused the temporary breakdown of the American democratic process and the tragedy of Civil War and Reconstruction.

407. The United States: Rise of Industrial America, 1877-1917. 3 credits. A survey of the rise of America to industrial and world power. Emphasis is placed upon the great changes which the Industrial Revolution brought and the American response to these changes. Detailed attention is given to the Populist and Progressive movements. F/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 home-front. F/2

410. History of Mexico. 3 credits. The study of modern Mexico from Independence to contemporary times, with concentration on the Revolution of 1911 and after, national integration, industrialization, and political consolidation. S/2

411. U.S., Foreign Relations, 1790-1900. 3 credits. An advanced survey of the major foreign policies developed by the U.S. from the American Revolution through 19th century. F/2

412. U.S., Foreign Relations Since 1900. 3 credits. An advanced survey of the major policies advocated and pursued by the U.S. during the 20th century. S/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

414. France Since 1815. 3 credits. A survey of French history from Napoleon to Chirac focusing on the polarization that led to France’s collapse in 1940 and how that split was healed. F

415. Germany Since 1815. 3 credits. A survey of German history from Kant to Kohl focusing on the social and religious divisions in Germany that led to the catastrophic of the Nazi regime. S

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 revolution- ary ideas. S

417. Russia Since 1855. 3 credits. A survey of Russia’s political, economic, social, and cultural development from the Great Reforms of Alexander II until the present — including the collapse of the Russian Empire, the rise and fall of the Soviet Union, and the rebirth of Russia. This course was two main themes: the collapse of the relatively successful Russian civilization to the West, and it examines the problems of “modernization” of traditional societies.

419. Great Britain Since 1815. 3 credits. A survey of British history since 1815 with an emphasis on the state of mind of being known as “Victorian,” as it was manifest-ed, 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 British Imperial history from the Tudors to the “Scramble for Africa.” Particular attention will be paid to the social, economic, and political factors which shaped Britain’s Imperial history as well as the history of its colonies. F/2

422. The British Empire and Commonwealth, 1884-the present. 3 credits. A survey of British Imperial history from the “Scramble for Africa” to the present. Beginning with an overview of the early Empire, this course will focus upon the cultural, economic, and political factors which shaped and led to the deconstruction of the Empire/Commonwealth in the modern era. F/2

425. American Family in Historical Perspective. 3 credits. This course is devised as a survey of the family over the nation’s first 400 years of existence. Course members will examine variations in the structure of the family, changes in the definition of the family and the forces which have wrought significant alterations in this most basic of social institutions, taking into consideration race, culture, and gender. S

431. Seminar in the History of the Great Plains. 3 credits. This course promotes focused study of the Great Plains of North America through reading, discussion, research, and writing. Students will examine all aspects of Great Plains history including culture, environment, social organization, economics, and politics from the ancient past to the present. S/2
440. Research. 2 credits. A methodology course. Though designed primarily for history majors, History 440 may prove very useful for students in other social science fields. Through discussion and working in the library, the students develop skills both in the compiling of a bibliography and in the use of journals, newspapers, government documents, manuscript collections, pictorial materials, etc. Each student writes a paper that demonstrates the use and evaluation of these historical source materials. F,S

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,P2

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 Theses. (CCN) 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. (CCN) 1-3 credits. Repeatable to 6. F,S

Honors (Hon)
J. Anderegg, Program Coordinator

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 24 credits of Honors coursework:

I. The Honors Program Requirements substitute for the University General Education Requirements.

II. The Honors Program English Composition Requirement.

One of the following courses (Honors sections preferred):
Engl 120 Composition II .......................... (3)
Engl 125 Technical and Business Writing ..................... (3)
Engl 308 Advanced Composition I ..................... (3)
Engl 408 Advanced Composition II ..................... (3)

III. Honors coursework from:
Hon 101 Inquiry in the Humanities .......................... (3)
Hon 102 Inquiry in the Social Sciences .......................... (3)
Hon 103 Inquiry in the Sciences .......................... (3)
Hon 250 Sophomore Honors Essay ..................... (1)
Hon 291 Colloquium in the Humanities ..................... (1-4)
Hon 292 Colloquium in the Social Sciences ..................... (1-4)
Hon 293 Colloquium in the Sciences ..................... (1-4)
Hon 301 Honors Mode .......................... (1)
Hon 391 Advanced Colloquium in the Humanities ..................... (1-4)
Hon 392 Advanced Colloquium in the Social Sciences ..................... (1-4)
Hon 393 Advanced Colloquium in the Sciences ..................... (1-4)
Hon 399 Independent Study .......................... (1-4)
Hon 489 Senior Honors Thesis ............... (1-9)

Eight of these 24 credits must be taken in colloquia. Honors sections of courses offered by other departments may also count for a portion of the 24 credits.

IV. Sophomore Honors Portfolio, submitted upon completion of 9 Honors credits.

V. Senior Honors Thesis.

101. Inquiry in the Humanities. 1-4 credits. Prerequisite: admittance to the Honors Program. Reading and discussion of selected works of humanistic value; orientation to methods of Honors work. Normally taken by first-year students in the Honors Program. F,S,SS

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 Honors Essay. 1 credit. Prerequisite: admittance to the Honors Program. An in-depth essay used to evaluate writing and organizational skills at the sophomore level. F,S,SS

251. 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

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: admittance to the Honors Program. Advanced interdisciplinary courses on varying topics in the humanities. F,S

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

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

Humans (Hum)
Barrentine, Carmichael, and Rand

The mission of the Humanities Program is to provide courses which meet the general education Arts and Humanities requirement. Emphasis is placed on small group discussion, critical reading of classical and modern texts, and written responses to the materials of the course.

101. Introduction to Humanities I. (CCN) 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 in the fine arts. F

102. Introduction to Humanities II. (CCN) 4 credits. While this course has the same structure and goals as Humanities 101, its subject matter is the writing of classical Greece. The authors read usually include Homer, Aeschylus, Sophocles, and Plato. S

The Humanities Program also administers the Integrated Studies Program, which is an interdisciplinary multi-course general education program for first year students. See the Integrated Studies Program listing for more information.

Indian Studies (IS)
M. Schneider (Chair), Gagnon, and Hans

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: 36 major hours, including:

<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 370</td>
<td>North American Indians</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 375</td>
<td>History of Federal Indian Law and Policy</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 440</td>
<td>Senior Colloquium</td>
<td>(3)</td>
</tr>
</tbody>
</table>

6 hours from Arts, Literature and Language:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 161</td>
<td>American Indian Languages I</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 162</td>
<td>American Indian Languages II</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 265</td>
<td>American Indian Literature</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 369</td>
<td>Literature and Culture</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>Traditional Amer. Indian Lit.</td>
<td></td>
</tr>
<tr>
<td>IS 255</td>
<td>Survey of Native American Arts</td>
<td>(3)</td>
</tr>
<tr>
<td>Anth 220</td>
<td>Native American Technology</td>
<td>(3)</td>
</tr>
</tbody>
</table>

3 hours from History:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</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 Culture</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 352</td>
<td>American Indian Philosophical Thought</td>
<td>(3)</td>
</tr>
</tbody>
</table>

6 hours from Contemporary Social Issues:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 330</td>
<td>Contemporary Plains Indian Culture</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 345</td>
<td>Contemporary American Indian Issues</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 346</td>
<td>Contemporary Indian Women</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 363</td>
<td>Native American Child Development</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 371</td>
<td>Reservation Government and Politics</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Electives: 6 hours

Any of the courses listed above that are not used to meet requirements may be taken as electives. Other electives in Indian Studies include IS 151, 379, 492 and 494.

A concentration in an area or field other than Indian Studies is also required of all majors. This concentration may be chosen in the following ways:

1. Proficiency in a language (equivalent to Level IV in a Native American or other language)
2. A minor in another subject matter field
3. In special instances, a supplementary concentration of at least 24 hours may be arranged between the student and the faculty of the Department. These concentrations are designed for students to obtain course work 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:

<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 370</td>
<td>North American Indians</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 375</td>
<td>History of Federal Indian Law and Policy</td>
<td>(3)</td>
</tr>
<tr>
<td>IS 440</td>
<td>Senior Colloquium</td>
<td>(3)</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. 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 ethnocentrism were perpetuated in various genres and fields, e.g. captivity tales, fiction, historical accounts, sociology, etc. Finally, students will analyze some recent examples of these stereotypes and ethnocentrism in print and film. Every two years.

201. History of the Sioux. 3 credits. The history of the Sioux from their earliest known beginnings to the present day, with special emphasis on the Lakota division. F

203. History of the Chippewa. 3 credits. A study of Ojibway history, life, and culture from the original contacts with White traders, subsequent relocations in the interior of North America, warfare and contact with other tribes; treaties and land cessions and establishment upon reservations; and contemporary status and problems. F

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

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

255. Survey of Native American Art. 3 credits. Examination of the methods, materials, and techniques of Native American visual arts, music, dance, and drama. F

330. Contemporary Plains Indian Culture. 3 credits. An examination of the ecology, social structure, economics, politics, and values of contemporary Plains Indians with special emphasis on reservation systems. S

331. Traditional Plains Indian Culture. 3 credits. An examination of the environment, social structure, political organization, religion and other aspects of Plains Indian life before the establishment of the reservations. F

345. Contemporary American Indian Issues. 3 credits. Study and discussion of issues of general importance to contemporary Native American life. F

346. Contemporary Indian Women. 3 credits. An examination of the historical and contemporary traditions, role, contributions, and issues concerning Indian women. F

352. 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

363. Native American Child Development. 3 credits. Examines the physical, mental and social development of Native American children from birth to puberty. Differences between traditional tribal ways and modern concerns are related to historical and cultural factors. F

370. North American Indians. 3 credits. Origins and nature of cultures in America north of Mexico. Study basic cultural areas and representative groups, culminating with a view of the status and prospects of the modern Indian and Eskimo in Canada and the United States. F

371. Reservation Government and Politics. 3 credits. To acquaint students with functions of diverse government agencies and the politics of Indian reservation self-gov-ernment. F

375. History of Federal Indian Law and Policy. 3 credits. A detailed discussion of Federal Indian law and policy from their colonial antecedents into contemporary times. Among other dimensions, an examination of motives, court decisions, statutes, executive orders and proclamations, and their consequences. F

379. Special Topics, 1-3 credits (Repeatable when topics vary). Topics and credits will vary with availability of staff, and with student interests. F

440. Senior Colloquium. 3 credits. Students will integrate the knowledge gained in other courses by reading and discussing selected, inter-disciplinary and theoretically based texts in Indian history and culture. S

492. Directed Readings in Indian Studies. (CCN) 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. (CCN) 1-3 credits. Maximum 9 credits. Consent of Instructor required. F,S,SS

**Industrial Technology**

**R. Diez (Chair), Holten, Huang, and Yearwood**

The Department of Industrial Technology has a program accredited by the National Association of Industrial Technology (NAIT) and offers three 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 Technology Management, Bachelor of Science in Industrial Technology (BSIT) with Teacher Certification, and Bachelor of Science in Occupa-tional Safety and Environmental Health (BSOSEH), see OSEH listing, Minors in Industrial Technology are an integral part of faculty offerings.
**College of Business and Public Administration**

**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 technological systems areas: Electronics and Computer Hardware, Graphic Communication, and Manufacturing.

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 110 Principles of Industrial Technology</td>
<td>(2)</td>
</tr>
<tr>
<td>IT 122 Computer Aided Design/Drafting</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 201 Electromechanical Fundamentals</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 202 Technical Drawing</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 203 Production Processes: Manufacturing</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 212 Principles of Graphic Design and Layout</td>
<td>(3)</td>
</tr>
<tr>
<td>Management Foundation Requirements</td>
<td>(18 Credit Hours Required)</td>
</tr>
<tr>
<td>IT 306 Technology and Society</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 330 Quality Assurance</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 340 Cost Estimating</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 403 Product Research and Development</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 420 Facilities Design</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 480 Industrial Safety</td>
<td>(3)</td>
</tr>
</tbody>
</table>

IV. Selected Electives for Industrial Technology Majors (21 credits required).

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 Computer Hardware Technology Systems

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 211 Electric Circuits and Devices</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 301 Microelectronic Circuits</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 311 Microcomputer Computer Hardware</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 341 Digital Integrated Circuits</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 441 Computer-Aided Circuit Analysis</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Graphic Communication Technology Systems

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 302 Web Page Design</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 322 Fundamentals of Photography</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 442 Desktop Publishing</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 452 Multimedia Production</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Manufacturing Technology Systems

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 204 Industrial Materials</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 213 Production Processes: Construction</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 223 Applied Synthetics</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 363 Manufacturing Automation</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 423 Computer Integrated Manufacturing</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Industrial Technology General Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 316 Technology Education for Teaching and Learning</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 343 Motion and Time Study</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 397 Cooperative Education</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 404 Materials Testing</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 412 Design/Drafting</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 493 Workshop</td>
<td>(1-6)</td>
</tr>
<tr>
<td>IT 497 Directed Studies in Industrial Technology</td>
<td>(1-8)</td>
</tr>
</tbody>
</table>

V. Students must select one of the following:

**INDUSTRIAL MANAGEMENT**

Students preparing for a career in industry will complete the following course work in addition to the BSIT course work listed under I, II, III, and IV above.

Required Support Courses: Select from the following or higher level (39 credits minimum):

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 217 Fundamentals of Management</td>
<td>(4)</td>
</tr>
<tr>
<td>Math 103 College Algebra</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 105 Trigonometry</td>
<td>(2)</td>
</tr>
<tr>
<td>Math 146/165 Applied Calculus I</td>
<td>(3-4)</td>
</tr>
<tr>
<td>Chem 121, 121L General Chemistry I</td>
<td>(4)</td>
</tr>
<tr>
<td>Phys 161, 161L Introductory College Physics I</td>
<td>(4)</td>
</tr>
<tr>
<td>Phys 162, 162L Introductory College Physics II</td>
<td>(4)</td>
</tr>
<tr>
<td>Econ 210 Intro to Bus &amp; Econ Statistics</td>
<td>(3)</td>
</tr>
<tr>
<td>Mgmt 301 Principles of Management</td>
<td>(3)</td>
</tr>
<tr>
<td>Mgmt 301 Production Management</td>
<td>(3)</td>
</tr>
<tr>
<td>Mgmt 302 Human Resources Management</td>
<td>(3)</td>
</tr>
<tr>
<td>Mkt 305 Marketing Foundations</td>
<td>(3)</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Phil 370 Ethics in Engineering and Science</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Seniors are encouraged to apply for the Certified Industrial Technologist (CIT), offered by the National Association of Industrial Technology (NAIT). Those in Manufacturing and Electronic Technology Systems are requested to take the Certified Manufacturing Technology (CMT) examination, conducted by the Society of Manufacturing Engineers (SME) or the Certified Quality Technician examination, conducted by American Society of Quality Control (ASQ). **TEACHER EDUCATION**

Students preparing for a career in technology teacher education will complete the following course work in addition to the BSIT course work listed under I, II, III, and IV above.

The teacher certification program offers students an opportunity to major in Industrial Technology and to complete the Secondary Education program of the Department of Teaching and Learning. Successful completion of the requirements of both programs qualifies the student for teacher certification in Technology Education. Successful completion of the BSTI selected electives section IV requirements must include the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 204 Industrial Materials</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 211 Electric Circuits and Devices</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 212 Principles of Graphic Design and Layout</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 213 Production Processes: Construction</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 223 Applied Synthetics</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 400 Teaching Technology Education</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Secondary Teacher Certification Requirements:

Formal admission to Teacher Education is required and is normally sought while enrolled in T&L 200 and requires a minimum of 2.50 GPA. To be accepted for student teaching, a student must have a 2.75 GPA in the major field of study and a 2.50 GPA in all course work attempted prior to applying for student teaching. Industrial Technology majors seeking teacher certification must have an advisor from the Faculty of Industrial Technology and the Department of Teaching and Learning.

**MINORS/INDUSTRIAL TECHNOLOGY:**

**Graphite Communication, Energy/Electronics, Manufacturing**

Twenty-three (23) credits to be selected as follows:

Eight (8) credits from the Required Core:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Core for Each Minor in Industrial Technology</td>
<td>(2)</td>
</tr>
<tr>
<td>IT 122 Computer Aided Design Drafting</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 300 Technology and Society</td>
<td>(3)</td>
</tr>
</tbody>
</table>

15 credits to be selected from one of the following Technology Systems Areas:

**Graphic Communication:** 15 credits to be selected from course work ending in l, e, 211, etc.

**Energy/Electronics:** 15 credits to be selected from course work ending in 1, 4, or 0, i.e. 203, 204, 340, etc.

**MANUFACTURING**

15 credits to be selected from course work ending in 1, 4, or 0, i.e. 203, 204, 340, etc.

The students who pursue the Minor in Technology Education must complete:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 122 Computer Aided Design Drafting</td>
<td>(3)</td>
</tr>
<tr>
<td>IT 400 Teaching Technology Education</td>
<td>(3)</td>
</tr>
</tbody>
</table>

AND the following 200 level IT courses:

201, 203, 204, 212, 213, 223.

The following IT courses may be taken in addition: 202, 211.

**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. F

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. F

201. Electromechanical Fundamentals, 3 credits. Prerequisites: Math 103; Co-requisite: Phys 101. The study of fundamental mechanical, hydraulic, pneumatic, and electrical apparatus used in power systems. F

202. Technical Drawing, 3 credits. Prerequisite: IT 122. The study of technical drawing techniques to include various projections, pictorials, dimensioning, development and tolerancing used in business and industry. Students will apply computer aided drafting (AutoCAD) in completing technical drawings. F

203. Production Processes: Manufacturing, 3 credits. Prerequisite: IT 110. Fundamental concepts of processing industrial materials, especially those utilized in manufacturing products, with emphasis on tools and techniques. S

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. F

211. Electronic Circuits and Devices, 3 credits. Prerequisites: IT 201 and Math 103. Concepts, principles and operational characteristics of electric components and circuits. Hands-on operation and experiments of electronic devices and equipment. S

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**Industrial Technology**
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. F

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/Y

223. Applied Synthesis. 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 emphasizing the various impacts of technology on the individual, society, environment and basic institutions. Technological matrix of various cultures. F/S

302. Information Systems. 3 credits. Prerequisite: IT 211. Study of electronic components and circuits (discrete and integrated) and their functional and operational characteristics. F

311. PC Hardware. 3 credits. An introductory course to personal computer hardware. Includes an understanding of: the development of PC microcomputers, hard, floppy, tape, optical drives and associated controllers; installation of PC components, board and systems setup, switch and jumper settings (where required) the boot-up process; CMOS setup; upgrading, trouble shooting, applying diagnosing procedures; and other general hardware knowledge. F

316. Technology Education for Teaching and Learning. 3 credits. A study of technology that involves the identification, creation, and evaluation of hands-on technology activities for educators to use in the classroom. Activities include, but are not limited to, computer applications, robotics, energy and power projects, photography, field trips, and problem solving. The course concludes with a technology fair at a local school. F/Y

322. Fundamentals of Photography. 3 credits. Fundamentals of Photography is a lecture/laboratory course designed to introduce students to the art and science of black and white photography. F/S

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

340. Cost Estimating. 3 credits. Prerequisites: ECON 210, Math 146, or equivalent or instructor consent. 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. Study of basic concepts of digital circuits and devices, operational characteristics of digital integrated circuits. S

343. Motion and Time Study. 3 credits. Prerequisites: IT 203 and ECON 210. The systematic determination of preferable work methods, with the appraisal, in terms of time, of the value of work involving human activity. Emphasis on the development of materials required to make practical use of these data. F/Y

363. Manufacturing Automation. 3 credits. Prerequisites: IT 201 and IT 203. Co-requisite: IT 312. The study of the fundamentals of automation as it relates to contemporary industry to include NC and CNC programming and systems, computer-assisted parts programming, industrial robot configurations, industrial automation applications, and integration of control systems and manufacturing technology. F

397. Cooperative Education. 1-6 credits. Prerequisites: Junior standing; 2.5 over-all GPA, and faculty approval. A practical work experience with approved industrial enterprise, arranged by the student, faculty and employer. Repeatable to 6 credits. S/U grading. F/S/S

400. Teaching Technology Education. 3 credits. Prerequisite: Junior standing and consent of instructor. An analysis of various methods employed in instructional techniques for industry and education. Development of methods and strategies of instruction use and ordering of instructional materials, based on behavioral objectives and classroom application of instructional techniques; lab activities. F/Y

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/Y

412. Design/Drafting. 3 credits. Prerequisite: IT 122 or consent of the instructor. The application of design and drafting techniques for the design of tools, machines and products. F/Y

420. Facilities Design. 3 credits. Prerequisite: IT 212. Principles and applications of designing industrial/business facilities with emphasis on site location, environmental consideration, qualitative and quantitative modeling. Computer application in facility planning and quantitative analysis; lab activities. S

423. Computer-Integrated Manufacturing. 3 credits. Prerequisites: IT 203 or consent of instructor. The study of the techniques utilized to integrate the process of automated production environments. Students will examine the forms of computer-based automated systems used in the various areas of a manufacturing system and how systems can be integrated through data communications networks. S

441. Computer-Aided Circuit Analysis and Design. 3 credits. Prerequisites: IT 301. An in-depth study of the concepts and technologies of computer-aided circuit analysis and design. Emphasis on the use of computer-aided designed tools used in industry for design and analysis of analog and digital circuits. S/Y

442. Desktop Publishing. 3 credits. Prerequisites: IT 212, 302 or consent of instructor. The course is designed to provide a broad understanding of computer-assisted publishing. It consists of lecture, discussion, and practical laboratory activities in the areas of current developments in hardware and software, input/output equipment, materials, and processes of electronic publishing. S

452. Multimedia Production. 3 credits. Prerequisites: IT 122 and 302. Lecture/Lab. Multidesign and computer-aided design production technologies including principles of animation, 3-D rendering, and interactive programming. The course provides hands-on experience through the production of a comprehensive project in which students examine and practice the design principles and interface guidelines used in digital communication technologies. F

493. Workshop. 1-6 credits. A workshop course on a specific topic. primarily for, but not confined to, Continuing Education. F/S/S

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 topics including (a) Curriculum Innovation, (b) Energy/Power, (c) Graphic Communication, (d) Production, and (e) Materials Science. F/S

Information Systems (ISys)

M. Robles (Chair), Braethen, O’Keefe, and Prigge

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, records managers, 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) and including:

- Acct 200, 201 .......................... Elements of Accounting I & II .......................... (6)
- Acct 315 ........................................ Business in the Legal Environment .......................... (3)
- Comm 110 ................................. Fundamentals of Public Speaking .......... (3)
- Econ 201 ................................. Principles of Microeconomics .......... (3)
- Econ 202 ................................. Principles of Macroeconomics .......... (3)
- Econ 210 ........................................ Introduction to Business and Economic Statistics .......... (3)
- Econ 303 ........................................ Money and Banking .................. (3)
- Fin 310 ........................................ Principles of Financial Management .......... (3)
- Isys 217 ................................. Fundamentals of Management .......... (4)
- Math 104 ........................................ Finite Mathematics .................. (3)
- Math 146 ........................................ Applied Calculus I .................. (3)
- Mgmt 300 ................................. Principles of Management .......... (3)
- Mgmt 301 ........................................ Production Management .......... (3)
- Mgmt 475 ................................. Strategic Management .................. (3)
- Mkts 305 ........................................ Marketing Foundations .......... (3)
- Poli 115 ................................. American Government I ........ (3)
- Psy 111 ........................................ Introduction to Psychology .......... (3)

III. Information Systems Major Courses:

- ISys 320 ........................................ Professional Communication for Business .......... (3)
- Isys 260 ........................................ Operating Systems Principles .......... (3)
- Isys 305 ........................................ End-User Applications .......... (3)
- Isys 315 ........................................ Project Management .......... (3)
- Isys 330 ........................................ Relational Database Design .......... (3)
- Isys 360 ........................................ Principles of Networking .......... (3)
- Isys 411 ........................................ Information Systems Seminar .......... (3)
Interdisciplinary Studies

Carmichael (Coordinator), Barrentine

(The permanent faculty is supplemented by faculty from other University departments.)

An extraordinary option for students, the Integrated Studies Program offers a cluster of 3-5 courses each semester which help students fulfill general education requirements necessary for all University undergraduates. (See University GERlisting for information.) Each semester students receive credit from the following general education categories: English Composition, Arts and Humanities, and Math, Science, and Technology. Additional credits each term may come from either of the last two categories listed above, or from Social Science.

Work and study in the Program are organized around a central theme, and carried out in a variety of small group settings in which discussion among students is emphasized. Close contact between students and faculty members is a strong feature of this learning community; students spend the entire semester together studying the same materials and form close relationships. The Program is designed to help develop skills such as critical thinking, writing, close reading of texts, cooperative work, and oral communication. The Program works well with most majors at UND; it is particularly good for deciding students and for any one interested in Education, Communication, or Pre-Law Studies.

Students interested in the Integrated Studies Program can call (701) 777-3622, or write to PO Box 7117, Grand Forks, ND 58202-7117. The Program’s office is located in 134 O’Kelly Hall on the University campus.

Information about the Program is also available on-line at: http://www.und.edu/dept/inter/ids/program.htm

Interdisciplinary Studies

B. 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 program of study focusing on a topic of interest, in consultation with an advisor 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 inherently synthesizes information and research from two or more disciplines. General requirements for the major are described below. Interested individual should contact the Director of Interdisciplinary Studies in O’Kelly Hall, Room 129 (phone: 701-777-2613; e-mail: ids@und.nodak.edu).

Integrated Studies

Carmichael (Coordinator), Barrentine

(Interdisciplinary Studies (IDS))
In addition to the individualized track described above, faculty at the University of North Dakota are developing several interdisciplinary programs of study. Examples of such programs include Graphic Design, Photography, Health Sciences, and Environmental Studies.

Recommended plans of study leading to the B.A. in Interdisciplinary Studies; Graphic Design or the B.A. in Interdisciplinary Studies; Photography have been developed that combine courses from three departments: Art, School of Communication, and Industrial Technology. The program is flexible and aims to prepare graduates for a variety of pursuits within the fields of Graphic Design and Photography.

Environmental Studies allows students to analyze the people side of environmental issues, as a means of personal and societal change. The program encourages diversity of ideas, allowing students to plan their programs (in consultation with an adviser) based on their anticipated professional and personal roles. While students may focus solely on environmental studies, they are encouraged to combine environmental studies with existing fields and to consider experiences on campus and beyond. Contact the Director of Interdisciplinary Studies for information about lists of recommended courses and advisers for the tracks outlined above.

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)
   - IDS 491. Capstone Interdisciplinary Seminar (I-3, not repeatable)
   - IDS 498. Senior Project (3, repeatable to 6)

   The remaining 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.

289. 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. F,S,SS

491. Capstone Interdisciplinary Seminar. 1-3 credits, not repeatable. Prerequisite: IDS 280. Corequisite: 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. S

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 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:

   Total of 30 credits plus language requirement:
   - Geog 163. World Regional Geography (3)
   - Pols 220. International Politics (3)
   - Anth 171. Cultural Anthropology (3)
   - History 102. Western Civilization II (3)
   - Pols 255. Comparative Politics I (3)
   - Rel 203. World Religions (3)

   Three (3) credits from the following:
   - Hist 106. Middle Eastern Civilization (3)
   - Hist 215. Latin America since 1825 (3)
   - Hist 362. Modern Chinese Civilization (3)
   - Hist 364. Modern Japanese Civilization (3)

   Nine hours of upper division courses in an international concentration or a modern language. These nine hours should be chosen in consultation with the Director of International Programs 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 hour requirement may be fulfilled. Study abroad is strongly encouraged.

   Language
   - Level Four Proficiency and additional three hours

**International Studies Minor Requirements**

1. Required Courses
   - Geog 163. World Regional Geography (3)
   - Pols 220. International Politics (3)
   - Anth 171. Cultural Anthropology (3)
   - History 102. Western Civilization II (3)
   - Rel 203. World Religions (3)

2. One Additional Course selected from the following:
   - Hist 106. Middle Eastern Civilization (3)
   - Hist 215. Latin America since 1825 (3)
   - Hist 362. Modern Chinese Civilization (3)
   - Hist 364. Modern Japanese Civilization (3)

3. 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 Director in International Programs.

4. Other courses may be substituted only with the consent of the Adviser in International Programs.

5. Language required: Level III proficiency.

**Languages: Department of Modern and Classical Languages & Literatures**

(W. Tschacher (Chair), Bakken, Benoit, Berne, DuBois, Erickson, Fleshman, Koprince, Lebugle, Maury, Nelson, Routon, and Thureen)

The Department of Modern and Classical Languages and Literatures offers study in French, German, Greek, Italian, Latin, Norwegian, Russian, and Spanish. See English 161 and 162 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 Classical Studies, French, German, Norwegian, Russian, and Spanish.

Course work is divided into Lower and Upper Divisions. The courses in the Lower Division (100-200) develop an increasing facility for understanding and using a second language and a progressively greater awareness of cultural contrasts between the United States and other countries. The curriculum in the Upper Division (300-400) continues to develop language skills as well as the literary, linguistic, and cultural foundations for a variety of careers, for graduate study, and for an appreciation of cultural achievements.

The requirements for a major or minor including any course work in related fields, are listed below under each language. Since the schedule for courses in related fields can vary from semester to semester, students must consult their faculty adviser for those courses approved for each semester. Students are responsible for planning their own programs of study to fit their needs, interests, and objectives. They are also responsible for consulting with their faculty adviser each semester and for obtaining the adviser’s approval of the courses elected.

Students’ suggestions are solicited for topics and areas of study which can be included in the department’s special courses. The Honors Tutorial and Honors Work courses offer students the opportunity to work in areas of mutual interest to them and to members of the departmental faculty. These courses enable students to qualify for graduation with the distinction of Senior Honors in their major field.

The Department encourages study in other countries and is able to recommend academic credit for approved study by its students at foreign institutions. 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. 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.

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

Credit which a student has 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.

Regularly enrolled students with knowledge gained through independent study or prior language study at an unaccredited institution may apply to take Validating or Challenge Examinations to establish appropriate credit. The levels of proficiency and amounts of advanced standing are as follows:

<table>
<thead>
<tr>
<th>Level</th>
<th>Course Equivalent</th>
<th>Credit</th>
<th>May enroll in</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>101</td>
<td>4 hours</td>
<td>102 courses</td>
</tr>
<tr>
<td>II</td>
<td>102</td>
<td>8 hours</td>
<td>201 courses</td>
</tr>
<tr>
<td>III</td>
<td>201</td>
<td>12 hours</td>
<td>202 courses</td>
</tr>
<tr>
<td>IV</td>
<td>202</td>
<td>16 hours</td>
<td>Upper Division courses</td>
</tr>
</tbody>
</table>

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

**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**

Students seeking secondary teacher certification in a language must complete the following:

General Education Requirements (see University GER listing).

Courses and credit hours required for a B.A. major in a language.

Students seeking teacher certification in French, German or Spanish must include among their electives at least two credits of phonetics and two credits of advanced grammar, with grades no lower than B in each of these courses; a course in civilization of the country or countries in which the language is spoken is also strongly recommended. Students seeking teacher certification in all languages must also take these additional courses:

- Hist 101 & 102. Western Civilization I and II (6)
- English courses beyond College Composition II (4)

Language majors should have advisers in both the Languages Department and the Department of Teaching and Learning.

The Program in Secondary Education (see Secondary Education listing) is to include:

- T&L 400 Methods and Materials of Teaching a Foreign Language
- 2 credits of T&L 390, supervised by Languages Department faculty (see Department of Teaching Learning listing).

**CLASSICAL STUDIES**

**B.A. WITH A MAJOR IN CLASSICAL STUDIES**

Required: 36 credits distributed between Parts A and B as follows:

I. General Education Requirements (see University GER listing).

**Part A: Language requirement (16 credits)**

A student may fulfill the language requirement in one of three ways:

- **Option 1, Latin:**
  - CLAS 101. First Year Latin I (4)
  - CLAS 102. First Year Latin II (4)
  - CLAS 201. Second Year Latin I (4)
  - CLAS 202. Second Year Latin II (4)

- **Option 2, Greek:**
  - CLAS 151. First Year Greek I (4)
  - CLAS 152. First Year Greek II (4)
  - CLAS 251. Second Year Greek I (4)
  - CLAS 252. Second Year Greek II (4)

- **Option 3, Greek and Latin:**
  - CLAS 101. First Year Latin I (4)
  - CLAS 102. First Year Latin II (4)
  - CLAS 151. First Year Greek I (4)
  - CLAS 152. First Year Greek II (4)

**Part B: Courses in classical civilization, literature, culture (20 credits)**

The remaining 20 credits should be chosen from the following. A minimum of 15 credits must be at the 300 level or above.

- ART 420. Greek and Roman Art (3)
- CLAS 185. Introduction to Classical Mythology (3)
- CLAS 301. Latin Prose (3)
- CLAS 362. Masterpieces of Latin Literature (3)
- CLAS 364. Special Topics in Classical Literature (3)
- CLAS 404. Latin Poetry (3)
- HIST 101. Western Civilization I (3)
- HIST 301. Medieval Civilization (3)
- HIST 343. Ancient Greece (3)
MINOR IN CLASSICAL STUDIES

Required: 28 credits distributed between Parts A and B as follows:

Part A: Language requirement (16 credits)

A student may fulfill the language requirement in one of three ways:

Option 1, Latin:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS 101</td>
<td>First Year Latin I</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 102</td>
<td>First Year Latin II</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 201</td>
<td>Second Year Latin I</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 202</td>
<td>Second Year Latin II</td>
<td>(4)</td>
</tr>
</tbody>
</table>

Option 2, Greek:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS 151</td>
<td>First Year Greek I</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 152</td>
<td>First Year Greek II</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 251</td>
<td>Second Year Greek I</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 252</td>
<td>Second Year Greek II</td>
<td>(4)</td>
</tr>
</tbody>
</table>

Option 3, Greek and Latin:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS 101</td>
<td>First Year Latin I</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 102</td>
<td>First Year Latin II</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 151</td>
<td>First Year Greek I</td>
<td>(4)</td>
</tr>
<tr>
<td>CLAS 152</td>
<td>First Year Greek II</td>
<td>(4)</td>
</tr>
</tbody>
</table>

Part B: 12 credits are to be selected from the courses listed below. A student may choose the courses to satisfy Part A and Part B.

Additional 100- and 200-level Latin courses, other than those used to satisfy Part A:

Other courses as approved by Classical Studies adviser.

*This is a student who may not use the same courses to satisfy Part A and Part B.

CLASSICAL STUDIES Courses (Clas)

101. First Year Latin I. (CCN) 4 credits. Introduction to Latin grammar and syntax, with selected readings from ancient authors. F

102. First Year Latin II. (CCN) 4 credits. Prerequisite: Clas 101 with a grade of C or better. Continued study of Latin grammar and syntax, with selected readings from ancient authors. S

151. First Year Greek I. (CCN) 4 credits. Introduction to ancient Greek grammar and syntax, with selected readings from ancient authors. On Demand

152. First Year Greek II. (CCN) 4 credits. Prerequisite: Clas 151 with a grade of C or better. Continued study of ancient Greek grammar and syntax, with selected readings from ancient authors. Grade of "C" or better in Clas 151 recommended. On Demand

185. Introduction to Classical Mythology. (CCN) 3 credits. Study of literary and artistic representations of Greek and Roman mythology. Different methods of interpreting myths will also be explored. These include anthropological, philosophical and psychological approaches. On Demand.

201. Second Year Latin I. (CCN) 4 credits. Prerequisite: Clas 102 or equivalent. Conclusion of basic grammar and introduction to Latin authors, such as Cicero, Nepos, Petronius, or Phaedrus. F

202. Second Year Latin II. (CCN) 4 credits. Prerequisite: Clas 201 or equivalent. Readings in Latin literature such as the works of Catullus, Ovid, or Vergil. S

251. Second Year Greek I. (CCN) 4 credits. Prerequisite: Clas 152 or equivalent. Conclusion of basic grammar and introduction to ancient Greek authors, such as Plato, Lysias, Xenophon, and Euripides. On Demand.

252. Second Year Greek II. (CCN) 4 credits. Prerequisite: Clas 251 or equivalent. Selected readings from works of ancient Greek literature, such as Homer's Iliad or Plato's Ion. May be repeated, with permission of the instructor, up to eight credits. On Demand.

301. Latin Prose. 3 credits; repeatable to 9. Prerequisite: Clas 202 or equivalent. Readings from major prose authors, such as Apuleius, Cicero, Sallust, Seneca, Livy, Petronius or Tacitus. On Demand.

362. Masterpieces of Latin Literature. 3 credits. Readings in English translation. A survey of some of the major works of Latin literature, including, for example, Vergil's Aeneid, Ovid's Metamorphoses, the speeches of Cicero, and the history of Livy. On Demand.

404. Latin Poetry. 3 credits; repeatable to 9. Prerequisite: Clas 202 or equivalent. Readings from major Latin poets such as Vergil, Horace, Catullus, Ovid, Juvenal, Martial, Plautus or Terence. On Demand.

491. Seminar in Latin Literature. (CNN) 2 credits; repeatable to 6. Prerequisite: Clas 202 or equivalent. Close translation and critical analysis of a major work of Latin literature. Students will be encouraged to pursue their own topics of interest and to develop those topics into an oral presentation and/or paper. On Demand.

494. Individual Greek and Latin Readings. (CCN) 1-4 credits. Prerequisite: Clas 252 or 202 or equivalent. Topic to be determined by the interest of the student and instructor. May be taken only with the consent of the department. May be repeated up to a total of 8 credit hours. On Demand.

MODERN LANGUAGES

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 347, 372, 373, 491, 494); Culture & Conversation (Fren 304, 305, 306, 340, 491, 494).

The following courses are required: Fren 301, 302, 304, 305, 306, and a minimum of 4 additional credits of Upper Division courses for a total of 14 credits.

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; however, 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. (CCN) 4 credits. Prerequisite: Fren 101 with a grade of B or better. Continued study of fundamentals of French grammar, oral use of the language and reading of easy French. Attendance in the language laboratory required. F,S

201. Second Year French I. (CCN) 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. (CCN) 4 credits. Prerequisite: Fren 201 or equivalent. Grammar review and introduction to literature. Emphasis on reading and writing skills. F

301. Third Year French. 3 credits. Prerequisite: Fren 202 or equivalent. Grammar review and introduction to literature. Emphasis on reading and writing skills. S


305. French Conversation and Culture. 2 credits. Prerequisite: Fren 202 or consent of instructor. A conversational approach to civilization and contemporary culture. On Demand.

306. French Conversation and Culture. 2 credits. Prerequisite: Fren 202 or consent of instructor. A conversational approach to civilization and contemporary culture. 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, 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 are awarded exclusively to qualified students of German.

Courses (Germ)

101. First Year German I. (CCN) 4 credits. Fundamentals of German grammar, oral use of the language and reading of easy German. F/S

102. First Year German II. (CCN) 4 credits. Prerequisite: Germ 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. (CCN) 4 credits. Prerequisite: German 102, or equivalent. Review of the structure of the language, practice in oral and written expression and reading in German. F

202. Second Year German II. (CCN) 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

304. German Phonetics. 3 credits. Prerequisite: German 201 or equivalent. Intensive pronunciation practice leading to proper German sound articulation and to a thorough knowledge of the principles of German pronunciation and intonation. S

307. Third Year German. 3 credits. Prerequisite: Germ 202 or equivalent. Further improvement of the four language skills: listening, writing, reading and speaking. Thorough grammar review. F

308. Third Year German. 3 credits. Prerequisite: Germ 307 or equivalent. Further improvement of the four language skills: listening, writing, reading and speaking. Thorough grammar review. S

312. Topics in German Culture. 3 credits. Prerequisite: Germ 202 or equivalent. A study of various aspects of German culture through the centuries. S

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. SU 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.

403. German Film. 3 credits. Prerequisite: Germ 308 or equivalent. Survey of the major contributions to ‘New German Cinema (1970’s to 1990’s).’ Attention to film as an artistic medium and to the cinematic representation of German history and culture. F/F2

404. Topic in German Literature. 3 credits, repeatable to 9 credits. Prerequisite: Germ 308 or equivalent. Topics vary: Literary periods, literary genres, individual authors, or interdisciplinary projects. Repeatable when topics vary. S/2

406. German Literature in Translation. 3 credits, repeatable to 9 credits. Introduction to major intellectual and artistic achievements of German civilization from the Middle Ages to the present, emphasizing the arts in the context of history and philosophy. Repeatable when topics vary. F/S

407. Fourth Year German. 3 credits. Prerequisite: Germ 308. Continuing and strengthening the skills practiced in third year German. F

408. Fourth Year German. 3 credits. Prerequisite: Germ 407. Continuing and strengthening the skills practiced in third year German. S

409. German Life and Civilization. 3 credits, repeatable to 9 credits. Introduction to major intellectual and artistic achievements of German civilization from the Middle Ages to the present, emphasizing the arts in the context of history and philosophy. Repeatable when topics vary. F/S

413. Advanced German Grammar Review. 3 credits. Prerequisite: Germ 308 or equivalent. Written composition and oral practice, with a review of those aspects of grammar which need most practice on the advanced level. F

414. Individual German Readings. (CCN) 1-3 credits. May be repeated to a total of six hours. Prerequisite: Germ 308 or equivalent. May be taken only with the consent of the department. F/S

Italian (Ital)

101. First Year Italian I. (CCN) 4 credits. Course seeks to develop students’ ability to speak, write and comprehend functional Italian through the fundamentals of grammar and to present aspects of Italian culture and civilization. On Demand.

102. First Year Italian II. (CCN) 4 credits. Prerequisite: Ital 101 with a grade of C or better. Continued study of pronunciation and fundamentals of grammar, application of oral, written, and comprehensive skills, continued exploration of Italian culture and civilization. On Demand.

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. (CCN) 4 credits. Introduction to the basic Norwegian language skills: reading, writing, speaking and listening; fundamentals of grammar. Language laboratory attendance required. F

102. First Year Norwegian II. (CCN) 4 credits. Prerequisite: Norw 101 with a grade of C or better. Basic Norwegian language skills; continuation of fundamentals of grammar. Language laboratory attendance required. S

201. Second Year Norwegian I. (CCN) 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. (CCN) 4 credits. Prerequisite: Norw 201 or equivalent. Selected cultural and literary readings, review of the structure of the language and development of language skills. S

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. SU grading only. On Demand.

403. Ibsen. 3 credits. Ibsen’s literary career, with intensive study of several of his most important dramas. Course offered in English for students in other fields. Norwegian minors and majors read in Norwegian. On Demand.

431. Advanced Norwegian. 3 credits. Prerequisite: Norw 202 or equivalent. Reading of selected works by leading Norwegian authors, interpretation and discussion. F/S

432. Advanced Norwegian. 3 credits. Prerequisite: Norw 202. Reading of selected works by leading Norwegian authors, interpretation and discussion. S/2
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. (CCN) 4 credits. Fundamentals of Russian grammar, oral use of the language and reading of easy Russian. Attendance in the language laboratory required. F

102. First Year Russian II. (CCN) 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. Attendance in the language laboratory required. 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. (CCN) 4 credits. Prerequisite: Russian 102 or equivalent. Review of the structure of the language, readings in Russian, practice in oral and written expression. S

202. Second Year Russian II. (CCN) 4 credits. Prerequisite: Russian 201 or equivalent. Review of the structure of the language, readings in Russian, practice in oral and written expression. F

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/S

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, (CCN) 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, (CCN) 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, 410; 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 307, 309, and three courses from among Span 310, 311, 420, 421, 422, and 423, of which one must be either Span 310, or 311; 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.

Courses (Span)

101. First Year Spanish I. (CCN) 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. Language laboratory attendance required. F

102. First Year Spanish II. (CCN) 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. Language laboratory attendance required. S

201. Second Year Spanish I (CCN) 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. (CCN) 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. 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.

305. Spanish Composition. 3 credits. Prerequisite: Span 202 or equivalent. Practice in a variety of forms of written Spanish. F

306. Spanish 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.

311. Spanish American Civilization and Culture. 3 credits. Prerequisite: Span 202 or equivalent or 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 338. 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.

339. 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. Repealable 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 writings 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 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-1650. 3 credits. Prerequisite: Span 307. A study of the development of the peninsular literary tradition from the Middle Ages to 1650, with lectures, readings, and analysis of representative texts. F

421. History of Spanish Literature, 1651-Present. 3 credits. Prerequisite: Span 307. A study of the development of the peninsular literary tradition from 1651 to the present, with lectures, readings and analysis of representative texts. F

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

456. Advanced Spanish Grammar. 3 credits. Prerequisite: Span 309 or permission of instructor. An in-depth examination of the grammar of the Spanish language. Repeatable with different topic. 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, 422, 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. Topic subject to review by Spanish faculty. On Demand.

494. Individual Hispanic Readings, (CCN) 1 to 3 credits. Prerequisite: Spanish 307 or equivalent. May be repeated to a total of six hours. May be taken only with the consent of the department. F-S

SPECIAL COURSES (Lang)

207. Introduction to Linguistics, 3 credits. An introduction to the nature of language, phonology, grammar, semantics, and historical, geographical, social and educational aspects of language. Same course as Engl 299.

256. 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. SU grading. Prerequisites: Language 102 or equivalent. Special subjects to be announced. F,S

389. Honors Tutorial. (CCN) 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.

400. Methods and Materials in Foreign Languages. 3 credits. Offered under T&L 400. F

489. Senior Honors Thesis. (CCN) 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

Linguistics courses are taught through a cooperative program between UND and SILL International during a nine-week summer session. Introductory courses are at the undergraduate level, and advanced courses are at the graduate level. (See the Graduate catalog for the M.A. program in Linguistics and the information at http://www.und.nodak.edu/dept/linguistics/lingma.htm.) While the University has no undergraduate degree program in linguistics, it is possible for students to have a concentration in languages and linguistics as English majors.

Students wishing to take SILL courses should apply directly to SILL, 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/catalog.htm, or call 1-800-292-1621. The co-chairs of the linguistics program are Mark Karan (mark_karan@siil.org) and Stephen Marlett, PO Box 8987, Catalina, AZ 85738 (steve_marlett@siil.org). During the summer, further information is available from the SILL office on campus when the courses are in session during the summer (777-8105).

Other departments also offer undergraduate courses relevant to linguistics: CSD 223; Engl 207, 309, 361, 362, 370, 417, 419, 442; Language 304, 413 (French; German; Spanish 304 only).

Courses

450. Articulatory Phonetics. 2 credits. Introduction to the theory and practice of articulatory phonetics. SILL only. SS

451. Phonology I. 3 credits. Prerequisite: 450. Introduction to phonological analysis, intensive practice in applying theoretical principles to problem solving and to field techniques. SILL only. SS

452. Syntax and Morphology I. 3 credits. Fundamentals of analyzing the grammatical and morphological structures of languages; analytical skills developed through graded problems based on a wide variety of languages. SS

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. SILL only. 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. SILL only. SS

480. Second 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

Management (Mgmt)

J. Vitton (Chair), Chong, Nam, Park, Patton, and Zahrly

The mission of the Department of Management is to provide practical and innovative management courses for undergraduate management 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 the 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 one comprehensive undergraduate program in management. The purpose of the program is to prepare the student for the challenges of modern management by providing the individual with an overall understanding of the basic functions of management as well as appropriate skills and problem solving methods.

The education program initiates the student into the complexities of organizational variables such as human resources and materials or physical facilities, and provides the student with appropriate frameworks for examining various institutions and environments 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 4 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)

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<thead>
<tr>
<th>Courses</th>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Freshman</td>
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<tr>
<td>Engl 110, 120 College Composition I, II.</td>
<td>(3)</td>
<td>(3)</td>
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<tr>
<td>PolS 115 American Government I.</td>
<td>(3)</td>
<td>(3)</td>
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<tr>
<td>Math 104 Finite Mathematics</td>
<td>(3)</td>
<td>(3)</td>
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<tr>
<td>Psyc 11 Introduction to Psychology</td>
<td>(3)</td>
<td>(3)</td>
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<tr>
<td>Arts and Humanities.</td>
<td>(3)</td>
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<tr>
<td>Comm 110 Fundamentals of Public Speaking</td>
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<td>(3)</td>
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<td>Soc 110 Introduction to Sociology</td>
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<td>or Anthropology</td>
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<td>Math 146 Applied Calculus</td>
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University of North Dakota

300. Principles of Management. 3 credits. Prerequisite: Junior classification. This course provides an introduction to the fundamental functions of management with a primary emphasis on leading and organizing. 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. Production Management. 3 credits. Prerequisite: Econ 210. This course teaches application of quantitative methods for solution of many problems concerning the production of goods and services. Specific problem areas investigated are: demand forecasting, capital budgeting, resource allocation, production scheduling, performance standards, inventory control, product and service design, and quality assurance. F,S

302. Human Resource Management. 3 credits. Prerequisites: Econ 210 and Mgmt 300. A survey of the concepts, procedures, and programs associated with Human Resources Management in organizations. It includes an overview of the basic management functions as these are linked to the execution of personnel functions of employment, training, compensation, and development. F,S

305. Managerial Concepts. 3 credits. Prerequisite: Junior level 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, motivation, work groups, authority, personnel staffing, leadership, change/conflict, communications, and controlling are explored in the context of supervisor personnel development. F,S

309. Quantitative Approaches to Management Decisions. 3 credits. Prerequisite: Econ 210. This course teaches the application of quantitative techniques which are useful in the decision-making process. Specific areas included are: decision theory, simulation, inventory models, linear programming, queuing, economic evaluation, game theory, and Markov process. F,S

310. Organizational Behavior. 3 credits. Prerequisites: Econ 210, Mgmt 300. 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

395. Special Topics. 3 credits. Specific topics will vary. Course will offer specialized knowledge in a specific area; e.g., Human Resource Management, Operations Management, Strategic Management. May be taken a maximum of two times for credit. On Demand.

397. Cooperative Education in Management. 1-6 credits, repeatable to a maximum of 12 credits. Prerequisites: Mgmt 300, 302, 2.50 GPA, and consent of coordinator. On-the-job compensated experience in general management or management of human resources. S/U grading only. F,S,SS

400. Organizational Theory and Analysis. 3 credits. Prerequisite: Mgmt 310. The course is designed to acquaint students with some of the alternative ways in which organizations may be designed to accomplish their tasks. The course reviews the development of organization theories, their current status, and their future. Emphases are placed on the analyses of system theories pertaining to structure, process, and context. F,S

405. Entrepreneurship and Small Business Management. 3 credits. Prerequisites: Fin 310, Mgmt 300, Mgmt 305. This course involves students in starting businesses, in buying businesses, in selling businesses, in assessing the possibility of new ventures, and in solving problems of small businesses. A term project is required. On Demand.

407. Wage and Salary Administration. 3 credits. Prerequisite: Mgmt 302. The role of a wage and salary administrator is studied. The course focuses on the fundamentals of wage theory, job evaluation and pricing, employee evaluation, individual and group incentive plans, benefits, and managerial/executive compensation. On Demand.

408. Issues in Human Resource Management. 3 credits. Prerequisite: Mgmt 302. This course is designed to facilitate a more in-depth study of selected issues confronting organizations in the area of personnel administration. Treatment of these issues will be accomplished utilizing some combination of the following methods: extensive reading and class discussion, individual student reports, case study analysis, and/or individual student projects. On Demand.

409. Union-Management Relations. 3 credits. Prerequisite: Mgmt 302. This course provides the student with an overview of the role of labor unions in contemporary organizations. The primary emphasis of the course is on the collective bargaining process. Students are shown processes in the negotiation setting and causes of industrial disputes. On Demand.

420. Multinational Management. 3 credits. Prerequisites: Mgmt 300 and Fin 310. This course is an introduction to the dynamics of management processes encountered in a multinational business setting. It covers comparative management systems and analysis of various environmental conditions for making effective managerial decisions within a multinational company. Adaptation to different cultures is emphasized as one of the essential components of the successful multinational management equation. On Demand.

457. Strategic Management. 3 credits. Prerequisites: Mgmt 300, 301, Fin 310, Mgmt 305, and 105 credits. This is the capstone course in business. Students apply knowledge gained in accounting, economics, finance, management, and marketing to develop business strategies. Case studies, simulations, and other exercises are used to develop executive skills. F,S,SS


494. Readings in Management. 1 to 4 credits. Prerequisite: Senior or graduate standing, and consent of instructor. Selected readings in management. F,S
Marketing
(MRKT)

S. Nelson (Chair), Askim, Bateman, Elbert, Lesch, and Tangsrud

The Department of Marketing is part of the College of Business and Public Administration. The Department offers a program in Marketing which is designed to prepare students for domestic and international managerial careers in sales, advertising, distribution, marketing research and product planning. In accordance with the mission of the College of Business and Public Administration, the mission of the Faculty of Marketing is: To provide a high quality marketing program that develops a rich understanding of marketing concepts and their application in a variety of interdisciplinary endeavors while also contributing to the enhancement of skills in problem solving, communication, leadership, team building, and the use of technology. These programming efforts are designed to attract a diversity of achievement-oriented students as a foundation for student, University, and state advancement. The marketing faculty offer a balanced and integrated commitment to excellence in teaching, research, and service. The Faculty strives to meet this mission by adhering to the following goals and values: (1) Educate students to be literate and competent in conducting marketing operations locally, regionally, nationally, and internationally, (2) Cooperate and interact with local and regional businesses, (3) Integrate current business issues and delivery systems throughout the marketing curriculum, (4) Provide faculty with an environment and support system conducive to the encouragement of intellectual contributions and service endeavors that are consistent with the mission of the College and University, (5) Seek and reward excellence, (6) Respect diversity of thought and culture, (7) Treat students, colleagues, and all stakeholders fairly, equitably, and with dignity.

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:

- Acct 200, 201 Elements of Accounting I & II (6)
- 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)
- ISys 217 Fundamentals of Management Information Systems (4)
- Acct 315 Business in the Legal Environment (3)
- Math 104, 146 Finite Mathematics, Applied Calculus I (6)
- Mgmt 300 Principles of Management (3)
- Mgmt 301 Production Management (3)
- Fin 310 Principles of Financial Management (3)
- Mgmt 475 Strategic Management (3)
- Mrkt 305 Marketing Foundations (3)
- Poli 115 American Government I (3)
- Comm 110 Fundamentals of Public Speaking (3)

One course selected from the following:

- Anth 171 Introduction to Cultural Anthropology (3)
- Psych 111 Introduction to Psychology (3)
- Soc 110 Introduction to Sociology (3)

Major in Marketing

- Mrkt 310 Buyer Behavior (3)
- Mrkt 325 International Marketing (3)
- Mrkt 320 Marketing Research I: Design (3)
- Mrkt 420 Marketing Research II: Application (3)
- Mrkt 450 Marketing Management (3)

Complete at least 12 credits from the following:

No more than a total of 3 credits from Mrkt 337, Mrkt 380, and Mrkt 396 may be used to satisfy this requirement.

- Mrkt 311 Personal Selling (3)
- Mrkt 312 Advertising (3)

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 initiating a systematic career planning process. Career planning prior to the senior year helps incorporate internships, job shadowing, and/or cooperative education into students’ program of study. Particular emphasis is placed on the application of the marketing concepts in professional career initiation and on the development and delivery of marketing presentations. The course also incorporates attitude testing, mock interviews, discussion of job search using the Internet, networking, and time management strategies, and portfolio development. S

305. Marketing Foundations. 3 credits. Required of all students in Business and Public Administration. Prerequisite: Econ 201. An overview of the scope and nature of market exchange and the buyer’s pivotal role. F,S

310. Buyer Behavior. 3 credits. Prerequisite: Mrkt 305. Theoretical and applied analysis of consumer and organizational buying behavior. F,S

311. Personal Selling. 3 credits. Prerequisite: Mrkt 305. The personal selling process including prospecting, qualifying, handling objections, and closing. F,S

312. Advertising. 3 credits. Prerequisite: Mrkt 305. Thorough examination of the basic principles of creating an advertising campaign. Special emphasis on buyer perceptions, theories of communication and learning, and their relation to message, media, and vehicle selection. F,S

315. Retail Management. 3 credits. Prerequisites: Mrkt 305, and Acct 201. Application of marketing and financial principles to the planning and execution of retail management. Includes analyses of relevant institutions and interest groups. F

320. Marketing Research I: Conceptual Perspectives in Global Marketing. 3 credits. Prerequisites: Mrkt 305, and Econ 210. The research process from a marketing perspective. Addresses problem formulation, research design, methodology, and appropriate statistical methods. F,S

325. International Marketing. 3 credits. Prerequisite: Mrkt 305. Fundamentals of conducting marketing operations across national boundaries; market potential estimation, entry strategies, program management and control. F

380. Internship in Marketing. 1-3 credits. Prerequisites: Mrkt 310, and Consent of Chair. Compensated, practical experience with selected participating firms. SU/grad only. F, S, SS

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, SS

397. Cooperative Education in Marketing. 1-8 credits, repeatable only to maximum of 8 credits. Prerequisites: 9 hours of marketing, GPA of 2.75, and Consent of Instructor. Compensated, on-the-job experience in various areas of marketing. SU/grad only. F, S, SS

410. Sales Management. 3 credits. Prerequisite: Mrkt 305. The practice of sales management including sales force recruiting, training, organization, motivation, compensation, and evaluation. F,S

412. Promotional Strategy. 3 credits. Prerequisite: Mrkt 312. Relationship of marketplace activities to promotional processes; integration of promotional tools into marketing strategy. F

415. Retail Buying. 3 credits. Prerequisite: Mrkt 315. Analysis of buying practices and techniques, with a focus on the impact of consumer buying power, resources, governmental regulations, merchandise planning and control, pricing, purchase negotiations, and open-to-buy. S

420. Marketing Research II: Application. 3 credits. Prerequisite: Mrkt 320. Application of procedures appropriate for the analysis and interpretation of marketing data. F,S

425. Current Perspectives in Global Marketing. 3 credits. Prerequisite: Mrkt 305. An examination of emerging worldwide economic, political, and cultural trends and the resulting challenges to international marketing. Students will be introduced to major international organizations and regional trade blocs to explore their implications on global marketing and trade. F

430. Small Business Projects. 3 credits. Prerequisites: Senior Standing. Offered under the auspices of the U.S. Small Business Administration. Student teams are assigned to work with selected small business clients. F, S

440. Special Topics in Marketing. 3 credits. Prerequisites: Mrkt 305, and Senior Standing. 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 310, Mrkt 320, and Senior Standing. Capstone course addressing the firm’s micro and macro environments from a strategic marketing decision making perspective. F,S
Mathematics
(Math)
Bevelacqua, Collings, Dearden, Dunnigan, Gilsdorf, Gregory, J. Ilams, M. Ilams, Khavanin, Metzger, Millsapugh, Peterson, Prigge, Richards, and Wells

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

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:

Computer Science 120 or 160 and 9 hours of writing courses including composition required under I. (Possible courses might be Engl 125, 210, 305 or ISBE 320.)

III. The Following Curriculum:

<table>
<thead>
<tr>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>39 major hours including:</td>
</tr>
<tr>
<td>Math 165, 166, 265 Calculus I, II, III</td>
</tr>
<tr>
<td>Math 327 Applied Linear Algebra</td>
</tr>
<tr>
<td>Math 441 Linear Algebra</td>
</tr>
<tr>
<td>Math 266 Elementary Differential Equations</td>
</tr>
<tr>
<td>Two full two-semester sequences from the list below</td>
</tr>
<tr>
<td>At least one sequence must include two 400 level courses</td>
</tr>
<tr>
<td>Electives (math courses numbered 208 and above, excluding 277, 377, 477)</td>
</tr>
</tbody>
</table>

Two Semester Sequences

<table>
<thead>
<tr>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 208 &amp; 408 Advanced Engineering Mathematics I and Ordinary Differential Equations</td>
</tr>
<tr>
<td>Math 409, 435, 471 Any two of these three (for at most one sequence): Geometry, Number Theory, Complex Variables</td>
</tr>
<tr>
<td>Math 421 &amp; 422 Statistical Theory I &amp; II</td>
</tr>
<tr>
<td>Math 431 &amp; 432 Advanced Calculus I &amp; II</td>
</tr>
<tr>
<td>Math 441 &amp; 442 Abstract Algebra &amp; Linear Algebra</td>
</tr>
<tr>
<td>Math 461 &amp; 462 Numerical Analysis I &amp; II</td>
</tr>
</tbody>
</table>

Teacher Certification

Students seeking secondary teacher certification in Mathematics must complete the Department of Teaching and Learning Requirements in Secondary Education (see Department of Teaching and Learning listing). Students seeking certification must follow the curriculum for the B.S. in Mathematics and complete items (a) and (b) below:

a. Choose the Math sequences of:
- Math 441 & 442
- Math 409 & 435

Students considering graduate school are urged to take a full year of Advanced Calculus, Math 431, 432.

All students are urged to take courses in disciplines which make use of mathematics such as Physics, Chemistry, Engineering, Computer Science and Biology.

MINOR IN MATHEMATICS

Required 20 credits, including:

<table>
<thead>
<tr>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 165, 166, 265 Calculus I, II, III</td>
</tr>
<tr>
<td>All electives must be chosen from courses numbered 208 and above, not including 277, 377, or 477</td>
</tr>
</tbody>
</table>

MINOR IN STATISTICS (Plan A)

Required 3 semesters of calculus (Math 165, 166, 265) as prerequisite.

Required: 9 credits, including:

<table>
<thead>
<tr>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Math 421, 422 Statistical Theory I, II</td>
</tr>
<tr>
<td>3 hours from:</td>
</tr>
<tr>
<td>*Biol 470 Biometry</td>
</tr>
<tr>
<td>*EFR 513 Basic Computer Applications in Education</td>
</tr>
<tr>
<td>*EFR 514 Small System Computer Applications in Education</td>
</tr>
<tr>
<td>*EFR 516 Statistics II</td>
</tr>
<tr>
<td>*CME 515 Design of Engineering Experiments</td>
</tr>
<tr>
<td>*Econ 310 Intermediate Business and Economic Statistics</td>
</tr>
<tr>
<td>*EE 411 Communications Engineering</td>
</tr>
<tr>
<td>*Math 321 Applied Statistics</td>
</tr>
<tr>
<td>*Math 403 Theory of Probability</td>
</tr>
<tr>
<td>*Math 415 Topics in Applied Math (when appropriate)</td>
</tr>
<tr>
<td>Math 416 Topics in Statistics</td>
</tr>
<tr>
<td>*Psych 541 Advanced Univariate Statistics</td>
</tr>
<tr>
<td>*Psych 542 Test Construction and Multivariate Analysis</td>
</tr>
<tr>
<td>*Psych 543 Experimental Design</td>
</tr>
<tr>
<td>Soc 521 Advanced Analytical Methods</td>
</tr>
</tbody>
</table>

*Indicates calculus as a prerequisite.

MINOR IN STATISTICS (Plan B)

Required Math 104, Finite Mathematics, and Math 146, Applied Calculus I, as prerequisites.

Required: 12 credits from:

<table>
<thead>
<tr>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Biol 470 Biometry</td>
</tr>
<tr>
<td>*EFR 513 Basic Computer Applications in Education</td>
</tr>
<tr>
<td>*EFR 514 Small System Computer Applications in Education</td>
</tr>
<tr>
<td>*EFR 516 Statistics II</td>
</tr>
</tbody>
</table>

103. College Algebra. (CCN) 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.S.S

104. Finite Mathematics, (CCN) 3 credits. Prerequisites: PTP* or Math 102. An elementary introduction to some of the mathematical techniques which have applications in the management, life, and social sciences. Topics covered include systems of linear equations, matrices, linear programming, mathematics of finance, and elementary probability. F.S.S

105. Trigonometry, (CCN) 2 credits. Prerequisite: One year of high school geometry and either PTP* or Math 102. Trigonometric functions and their inverses, solving triangles, trigonometric identities. F.S.S

107. Precalculus, (CCN) 5 credits. Prerequisite: Math 102 or PTP* Equations and inequalities; polynomial, rational, exponential, logarithmic and trigonometric functions; inverse trigonometric functions; algebraic and trigonometric methods commonly needed in calculus. F.S.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. 5 or on demand.

146. Applied Calculus I. (CCN) 3 credits. Prerequisite: PTP* or Math 103 or 104. A nonmajor introduction to differential and integral calculus. Topics include limits, continuity, differentiation and integration techniques, and applications. F.S.S

156. Calculus I. (CCN) 4 credits. Prerequisites: PTP* or Math 107. Limits, continuity, differentiation, Mean Value Theorem, integration, Fundamental Theorem of Calculus. F.S.S

166. Calculus II. (CCN) 4 credits. Prerequisites: Completion of Math 163 with a grade of C or better or permission of the Mathematics Department. Techniques and applications of integration, elementary transcendental functions, parametric equations, infinite sequences and series. F.S.S

208. Discrete Mathematics. 3 credits. Prerequisite: PTP* 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.S.S

265. Calculus III,(CCN) 4 credits. Prerequisite: Math 166. Multivariable and vector calculus including partial derivatives, multiple integration, line and surface integrals, Green's Theorem, Stokes' Theorem, the Divergence Theorem. F.S.S

266. Elementary Differential Equations. (CCN) 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.S.S

277. Mathematics for Elementary School Teachers. 3 credits. Prerequisite: PTP* or Math 103. For elementary education majors only. Development of the number systems used in elementary schools. Includes some methods and work with laboratory materials. F.S

308. History of Mathematics, 3 credits. Prerequisites: Math 166 or equivalent, or consent of instructor. This is a course on the conceptual and chronological history of mathematics. The course involves the interpretation and analysis of how and why mathematical ideas have developed over time, including political and cultural considerations. Topics include: numbers and continuing systems, non-Western developments, mathematics of Egypt, Babylonian and Greece, early European developments, the Renaissance, the Scientific Revolution and the development of calculus, women in mathematics, twentieth century mathematics.

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.S


330. Set Theory and Logic, 3 credits. Prerequisite: Math 166 or consent of instructor. Axioms and operations on sets, mathematical logic, relations and functions, development of the natural and real number systems. F.S


353. Advanced Engineering Mathematics II. 3 credits. Prerequisite: Math 266 and proficiency in a programming language. An introduction to several topics in applied mathematics, such as numerical analysis, statistics and complex variables. F.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.

397. 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 repeatable to 18. 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.S.S

403. Theory of Probability, 3 credits. Prerequisite: Math 265. Sets, sample spaces, discrete probability, distributions functions, density functions, characteristic functions, study of normal, Poisson, binomial and other distributions with applications. S2

405. Selected Topics in Mathematics, 1-3 credits. Prerequisite: permission of the Mathematics Department. May be repeated for credit. On Demand.

408. Discrete Structures, 3 credits. Prerequisites: Math 208 and 166. This course introduces the techniques and types of reasoning needed in combinatorial problem-solving. The course includes topics from graph theory and combinatorics.

409. Geometry, 3 credits. Prerequisite: Math 166. 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.


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 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.

416. Topics in Statistics, 1-3 credits. Prerequisites: An elementary statistics course and either Math 146 or 165, 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 illustrations. 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 421. 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, “F” and “T” tests, one and two-way ANOVA, nonparametric methods. S.F

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.S

435. Theory of Numbers, 3 credits. Prerequisite: Math 166. Basic properties of numbers, including divisibility, primes, congruences, Diophantine equations and residue theory. S2

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. F

456. 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 the course is to present the mathematical analysis provided in scientific modeling. Topics may include population modeling, mechanical vibrations, traffic flow, epidemic modeling, queues and decay processes. F/2

461, 462. Numerical Analysis I and II, 3 credits each. Prerequisite: Math 266, and either 327 or 442, and a scientific programming language. Prerequisite for 462 is Math 461. Numerical techniques for the solution of equations in one or several unknowns, approximate integration, differential equations, approximation theory, optimization theory and matrix analysis. Corresponding error analysis will be investigated. F/2, S/2

465. Operations Research, 3 credits. Prerequisite: A linear algebra course. This course has as its major emphasis, linear programming and its applications. Topics include the simplex method, duality, sensitivity analysis, the transportation problem and network flow. S/2

471. Introduction to Complex Variables, 3 credits. Prerequisite: Math 265 and 330 or consent of instructor. 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/2

477. Topics in 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.

494, 495. Reading Course in Mathematics. 1-3 credits, repeatable to 6 credits. Consent of instructor required. Directed individual reading on selected topics not developed in other courses. F,S,SS

Mechanical Engineering (ME)

D. Moen (Chair), Ames, Bandyopadhyay, Bibel, Bodine, Grewal, Johnson, Semke, Stanlake, and Tolbert

The Mechanical Engineering Department prepares graduates to function effectively as mechanical engineers in a wide spectrum of industries. Mechanical Engineers most often work in thermal sciences, mechanical design, or manufacturing processes. The required curriculum includes the fundamentals of each of these areas with opportunity to specialize in one area provided by technical electives. In all cases, however, the program’s educational objectives are:

- a) to develop depth in mathematics, science, and mechanical engineering topics
- b) to develop experimental capabilities
- c) to develop design skills
- d) to develop teamwork experience and skill
- e) to develop problem solving skills
- f) to develop an understanding of professional and ethical issues
- g) to develop communications skills
- h) to develop global and societal perspectives of engineering work
- i) to instill an ability and desire for lifelong learning
- j) to develop knowledge of contemporary mechanical engineering issues
- k) to develop skill in application of modern engineering tools.

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. 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.

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 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.

School of Engineering and Mines

B.S. IN MECHANICAL 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:

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 121</td>
<td>General Chemistry</td>
<td>(3)</td>
</tr>
<tr>
<td>Chem 121L</td>
<td>General Chemistry Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>Engl 110</td>
<td>College Composition I</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 125</td>
<td>Technical and Business Writing</td>
<td>(3)</td>
</tr>
<tr>
<td>Engl 200</td>
<td>Computer Applications in Engineering</td>
<td>(3)</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>(3)</td>
</tr>
<tr>
<td>Phys 252L</td>
<td>University Physics Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>or Chem 122</td>
<td>General Chemistry</td>
<td>(3)</td>
</tr>
<tr>
<td>Chem 122L</td>
<td>General Chem Lab</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Sophomore Year

| Engr 201     | Statics | (3)         |
| Engr 202     | Dynamics | (3)         |
| Engr 203     | Mechanics of Materials | (3) |
| Econ 203     | Principles of Microeconomics | (3) |
| EE 206       | Circuit Analysis | (3) |
| Math 265     | Calculus III | (4) |
| Math 266     | Intro to Differential Equations | (3) |
| ME 203       | Mechanical Design Fundamentals | (3) |
| Phys 252     | University Physics II | (3) |
| Phys 252L    | University Physics Lab II | (1) |
| or Phys 253  | University Physics III | (3) |
| or Phys 253L | University Physics Lab III | (1) |
| or Chem 122  | General Chemistry | (3) |
| Chem 122L    | General Chem Lab | (1) |

Junior Year

| ME 301       | Materials Science | (3)         |
| ME 306       | Fluid Mechanics | (3)         |
| ME 311       | Manufacturing Processes I | (3) |
| ME 313       | Engineering Fundamentals | (2) |
| Math 321     | Applied Statistical Methods | (3) |
| or Math 353  | Advanced Engr Math II | (3) |
| ME 322       | Kinematics and Dynamics of Machines | (3) |
| ME 323       | Mech Component Design | (3) |
| ME 324       | Dynamic Systems Analysis | (3) |
| ME 341, 342  | Thermodynamics | (3) |
| Engr 460     | Engineering Economy | (3) |

Senior Year

| ME 418       | Manufacturing Processes II | (3) |
| ME 474       | Fund Heat & Mass Transfer | (3) |
| ME 480       | Mechanical Engineering Seminar | (3) |
| ME 483       | Mechanical Measurements Lab | (3) |
| ME 486       | Mechanical Engineering Practice | (3) |
| ME 487       | Engineering Design | (2) |
| ME 488       | Engineering Design | (3) |
| Phil 370     | Ethics in Engineering and Science (A&H) | (3) |
| ME 341       | Social Science | (3) |
| or Tech Electives | (3) |

TECHNICAL ELECTIVES:

| ME 406       | Advanced Manufacturing Processes | (3) |
| ME 426#      | Mechanical Vibrations | (3) |
| ME 429#      | Introduction to Finite Element Analysis | (3) |
| ME 446#      | Gas Turbines | (3) |
| ME 449#      | Internal Combustion Engines | (3) |
| ME 451       | Heating and Air Conditioning | (3) |
| ME 476#      | Intermediate Fluid Mechanics | (3) |
| ME 490       | Special Laboratory Problems | (3) |
Aerospace Concentration: Requires 141 hours

Students completing the above curriculum with the following modifications will be deemed to hold a B.S. in Mechanical Engineering with an Aerospace Concentration.

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. The requirement of ME 418 will be replaced by a requirement for ME 429 (a normal technical elective).
3. Technical electives must be chosen from the aerospace group of electives as identified by a # in the above technical elective listing. An ME 490 or an ME 590 may also be included in the aerospace group at the discretion of the Mechanical Engineering Department.

**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

### 203. Mechanical Design Fundamentals
3 credits. Prerequisite: Engr 101. Corequisite: Phys 251 or Engr 201. Academic career plan, computational aids to engineering, shop familiarization analysis of a machine or system, specification, writing and design of a simple machine or system. 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 flow; compressible flow; open channel flow. F/S

### 311. Manufacturing Processes I
3 credits. Prerequisites: ME 301 and Engr 203. Corequisite: Engr 460. Descriptive and analytical study of manufacturing methods and economics as they pertain to casting, welding and forming processes. Includes lab. S

### 313. Engineering Materials
2 credits. Prerequisite: ME 301. Relationships between materials, manufacture and design of engineering components. S

### 322. Kinematics and Dynamics of Machines
3 credits. Prerequisite: Engr 101, 200, 202. Analytical and graphical study of motions, velocities, accelerations and forces for design of machine elements such as linkages, cams and gears. F

### 323. Machine Component Design
3 credits. Prerequisite: Engr 203, ME 322. Design and analysis of machine elements such as shafts, bearings, gears, clutches, springs, and threaded components. Analysis of stress, strain, and deflection including irregular beams and Castigliano’s theorem. Study of failure theories, fatigue failure, and surface damage. Design of bolted, riveted, welded, and bonded joints. Includes laboratory. S

### 324. Dynamic Systems Analysis
3 credits. Prerequisites: Math 266, Engr 202. Study of single-degree-of-freedom systems, multi-degree-of-freedom systems, continuous systems, feedback control, system stability, control actions, block diagrams, computer simulation. S

### 341. Thermodynamics
3 credits. Prerequisites: Phys 251, Math 166. Fundamental concepts of thermal energy relationships, processes and cycles. F/S

### 342. Thermodynamics
3 credits. Prerequisites: ME 341. Real vapors, gas-vapor mixtures, power and refrigeration cycles. S

### 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. S/U grading only. F,S,SS

### 416. Advanced Manufacturing Processes
3 credits. Prerequisites: ME 311, 418. Individual projects involving the manufacturing economics and flow charts for selected products and basic technical principles of manufacturing processes. Includes laboratory. On Demand.

### 480. Manufacturing Processes II
3 credits. Prerequisites: ME 311, 313. Descriptive and analytical study of manufacturing methods and economics as they pertain to machining, metrology and automation. Includes laboratory. F

### 486. Mechanical Vibrations
3 credits. Prerequisite: ME 324. 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. On Demand.

### 492. Introduction to Finite Element Analysis
3 credits. Prerequisite: Engr 202. 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.

### 493. Gas Turbines

### 494. Internal Combustion Engines

### 451. Heating and Air Conditioning
3 credits. Prerequisite: ME 342. Corequisite: ME 474. Psychrometrics, heating and cooling loads and analysis of air conditioning systems. On Demand.

### 474. Fundamentals of Heat and Mass Transfer
3 credits. Prerequisites: Math 266, ME 306 and 341. Convection, conduction, radiation, dimensional analysis and design of heat transfer equipment. F

### 476. Intermediate Fluid Mechanics

### 480. Mechanical Engineering Seminar
3 credits. Prerequisite: Senior standing. Reports and discussions on current developments in mechanical engineering. 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

### 486. Mechanical Engineering Practice
3 credits. Prerequisites: ME 483. Continuation of ME 483 with emphasis shifted to instrumentation, operation, and analysis of mechanical equipment and processes. S

### 487. Engineering Design
2 credits. Prerequisites: ME 323, 342. Corequisites: Engr 460, ME 474, 483. The first course of a 2 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 a 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
2 credits. Introduction to the roles, ethics, certification, education, employment and fundamental knowledge and skills related to the health science professions. F,S
Microbiology and Immunology

(MBio)

Melvold (Chair), Bradley, Flower, Hill, Nilles, Sailer, and Young

Courses

202. Introductory Medical Microbiology Lecture. 3 credits. Prerequisite: Chem 105 or 107. 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 diseases. F

202L. Introductory Medical Microbiology Laboratory. 2 credits. Prerequisite: 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. Prerequisite: Biol 150 or permission of instructor. Two hours lecture per week. An introduction to general microbiology with emphasis on the morphology, classification, and physiology of bacteria, molds, 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, purity culturing, and biochemical tests. S

328. Introduction to Immunology. 2 credits. Prerequisites: Biol 150, 151, or BICh 301 or equivalent. An introduction to the fundamentals of immunology including immunochemistry, humoral and cellular response, hypersensitivity, immunodeficiency, immunogenetics, tolerance and immunopathogenesis. F

494. Directed Studies. (CCN) 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)

M. Drumm (Chair), Fugere, Manning, Mickelsen, and Thatcher

The Army Reserve Officer Training Corps (ROTC) offers a program of instruction designed to mold young men and women into responsible, self-disciplined 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, administration, problem solving and decision making. Selection for active Army duty and for commissioning as a regular Army officer is competitive. Students commissioned as reserve officers may request active duty or may serve with the Army Reserve or National Guard after a short period of active duty for officer training. The program is voluntary and is open to both male and female students. Enrollment in Military Science I (freshman year) entails no military service obligation. This offers the student an opportunity to explore military science subjects and is a basis upon which to decide about further enrollment in military science including entering competition for an ROTC scholarship. Winners of three or four year ROTC scholarships incur a military obligation when they enter their MS II (sophomore) year. Other students incur no obligation until their MS III (junior) year. Successful completion of MS I and MS II is a prerequisite to enrollment in MS III and MS IV; however, placement credit procedures are available for veterans, Junior ROTC participants, and transfer students formerly enrolled in other ROTC programs, or by completion of a summer basic camp. Questions concerning placement eligibility should be directed to the Military Science Department. Financial assistance is available in the form of two, three, and four year ROTC scholarships, These scholarships pay tuition, laboratory fees and a flat rate for textbooks and equipment and a modest monthly cost of living allowance. All ROTC scholarship students and each nonscholarship junior and senior are paid a cost of living allowance. The advance course may be taken for credit only by nonobligated students with prior arrangement through the Department of Military Science. The Military Science Department is housed in the University Armory which contains a library, physical fitness center, and 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 at least one undergraduate course from each of five designated fields of study to meet the requirements for commissioning. Usually, meeting the general university requirements and specific major area requirements will satisfy most of the Professional Military Educational requirements. Specifically, cadets must take a course in written communication, military history, human behavior, computer literacy, math reasoning, management, and national security affairs.

MINOR IN MILITARY SCIENCE

Required 29 credits, including:

- MSci 301
- MSci 301 LAB
- MSci 302
- MSci 302 LAB
- MSci 303
- MSci 303 LAB
- MSci 341
- MSci 342
- MSci 401
- MSci 401 LAB
- MSci 402
- MSci 402 LAB
- MSci 441
- MSci 442
- Hist 210
- Military History

3 credits from the following:

- Pols 220
- Pols 225
- Hist 239
- Hist 339
- Hist 411
- Hist 412
- U.S. Foreign Relations Since 1900

3 credits from the following:

- Comm 212
- Mgmt 300
- Mgmt 305
- Nurs 478
- Phil 370
- Phil 370
- Isl 217

3 hours from the following:

- Interpersonal Communication
- Principles of Management
- Managerial Concepts
- Leadership and Management
- Moral Questions and the Professions
- MQP: Ethics in Business and Public Administration
- Fundamentals of Management Information Systems

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, first aid, and basic marksmanship. Learn fundamental concepts of leadership in both a classroom and outdoor laboratory environment. Participation in a weekend exercise is optional.

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 fundamentals of leadership.

102. Military Science II. 2 credits. Learn and apply the principles of effective leadership. Reinforce self-confidence through participation in physically challenging exercise with upper division ROTC students. Develop oral and written communication skills that will improve individual and group interaction. Develop skills in basic first aid, land navigation, and radio communications.

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 followership.

201. Military Science II. 2 credits. Learn and apply 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, advanced first-aid, land navigation and basic military tactics. Learn fundamentals of ROTC’s Leadership Assessment Program. Leadership lab. MSci 202L, and a weekend exercise is optional. I lower division students.

201L. Leadership Lab. I. 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

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. Leadership lab. MSci 202L, a weekend exercise is optional. S


215. Conflict Simulation. I. credit. A course analyzing military strategy and tactics through the use of war gaming activities based upon historical renderings. F,S

241. FIT: Military Phy Conditioning. I. credit. Corequisites: MSci 201, 201L. Building on concepts of the 100 level class, emphasizing on the Army components of physical fitness; cardiopulmonary endurance, muscular strength, muscular endurance, flexibility and body composition. A key objective is for each student to achieve a minimum score of 230 points total, in the three events of the Army Personal Fitness Test (APFT): pushups, sit-ups, and a timed two-mile run. F

242. FIT: Military Phy Conditioning. I. credit. Corequisites: MSci 202, 202L. Continuation of 201 with emphasis on leadership of a squad during physical training, supervising each individual’s correct performance of stretching and calisthenics, as well as following assigned students progression and taking responsibility for monitoring subordinates. A key objective is for each student to achieve a minimum score of 250 points total, in the three events of the Army Personal Fitness Test (APFT): pushups, sit-ups, and a timed two-mile run. F

290. ROTC Basic Course. 4 credits. A course designed to qualify students not participating in the Military Science I and II programs for entry into the ROTC Advanced Course. Course includes those subjects presented in MSci 101, 102, 201, and 202. F

301. Military Science III. 3 credits. Prerequisite: ROTC Basic Course or advanced placement credit. Series of practical opportunities to lead small groups, receive personal assessments and encouragement, and lead again in situations of increasing complexity. Uses small unit defensive tactics and opportunities to plan and conduct training for lower division students both to develop such skills and as vehicles for practicing leadership. Three hours lecture and one 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. I. credit. Corequisites: MSci 301 and 341. Series of practical opportunities to lead small groups, receive personal assessments. Use small unit defensive 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 tasks; prepare written or oral guidance for team members to accomplish tasks. Delegate tasks and supervise. Plan for and adapt for 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 option. S

302L. Leadership Lab. I. credit. Series of practical opportunities to lead small groups, receive personal assessments. Use small unit defensive tactics and opportunities to plan and conduct training for lower division students. Preparation for Army ROTC advanced camp at Ft. Lewis, Washington in the summer. S

341. FIT: Military Phy Conditioning. I. 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. FIT: Military Phy Conditioning. I. 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. F

344. ROTC Leader Development. I. credit. Corequisites: MSci 302, 302L. Preparation for Army ROTC advanced camp at Ft. Lewis, Washington in the summer. S

345. ROTC Leader Development. I. credit. Corequisites: MSci 302, 302L. Continuation of 344 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. F

351. Military Science IV. 3 credits. Prerequisites: MSci 301, 302 Corequisites: MSci 401L, 441. Instruction in organization and function of a military staff. military correspondence, counseling, problem solving, leadership ethics and code of conduct course includes leadership laboratories and field exercises. M

401. Leadership Lab. I. credit. Corequisites: MSci 401, 441. Series of practical opportunities. A culmination of all the concepts learned in the previous classes. With emphasis on operation order writing for Company level and higher. Responsible for all Army ROTC Cadet Battalion training and evaluation of training. F

402. Military Science IV. 3 credits. Prerequisite: MSci 301, 302 Corequisites: MSci 402L, 442. Instruction in organization and function of a military staff, military correspondence, counseling, problem solving, leadership ethics and code of conduct course includes leadership laboratories and field exercises.

Music

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, 200, 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 audition 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 130 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 degree in either Music Education or Performance, the Bachelor of Science in Education combined major in Elementary Education and Music, and the Bachelor of Arts, Music Therapy Emphasis, must pass all levels of Piano Proficiency (Music 133, 136, 233, 236 or equivalent). Other Bachelor of Arts students must pass Piano Proficiency Level I (Music 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 a large ensemble each semester of residence except for the semester of student teaching. Ensemble requirements for other degree programs vary. 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 and in Music Education. 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 admittance 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 pass a qualifying jury examination on the major instrument or voice by the end of the second year, to present a final project, and to perform a recital during the third year, and to present a final 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 certification in instrumental, choral, and general music, grades K-12.

The Bachelor of Arts, Music Therapy Emphasis, is a competency-based program, which includes both academic and clinical work, culminating in an internship of 1040 hours. Academic requirements include courses in Anatomy and Psychology as well as Music and Music Therapy courses. Clinical requirements include three 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.

Through the College of Education and Human Development, students may pursue a Bachelor of Science degree in a combination of Elementary Music and Elementary Education. Although not accredited through NASM, students graduating from this program are certified to teach regular elementary school subjects in grades K-6 as well as general music for those grades. In addition to examinations in traditional classroom courses, student progress in Applied Lessons is evaluated every semester through Applied Music jury examinations. Assessment of progress towards degree also includes a fourth-semester mid-program review, and a pre-graduation review. Music Education students must complete a portfolio review as required by the Department of Teaching and Learning.

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 132 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>Core Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musc 130, 134, 230, 234 ... Harmony and Theory Sequence ... (12)</td>
</tr>
<tr>
<td>Musc 131, 135, 231, 235 ... Aural Skills Sequence ... (4)</td>
</tr>
<tr>
<td>Musc 203 ... Musics of the World ... (3)</td>
</tr>
<tr>
<td>Musc 310, 311, 312 ... Music History Survey I, II, III ... (9)</td>
</tr>
<tr>
<td>Musc 256 ... Basic Conducting ... (2)</td>
</tr>
</tbody>
</table>

Performance Courses

<table>
<thead>
<tr>
<th>Major Instrument</th>
<th>(24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Instrument (may include Keyboard Skills Sequence;)</td>
<td>(4)</td>
</tr>
<tr>
<td>Ensembles, Large and Small</td>
<td>(12)</td>
</tr>
<tr>
<td>Musc 444 ... Applied Music Pedagogy ... (2)</td>
<td></td>
</tr>
<tr>
<td>Musc 359 ... Junior Recital ... (1)</td>
<td></td>
</tr>
<tr>
<td>Musc 459 ... Senior Recital ... (1)</td>
<td></td>
</tr>
<tr>
<td>Piano Proficiency through Level III or</td>
<td>(24)</td>
</tr>
<tr>
<td>Musc 133, 136, 233, 236 ... Keyboard Skills Sequence ... (4)</td>
<td></td>
</tr>
</tbody>
</table>

**VOCAL MAJORS**

Other Supportive Courses

| History and Literature | (6) |
| Theory and Composition | (6) |
| Music Electives (Other than performance) | (3) |
| Foreign Language Requirement | (8) |

Electives in disciplines other than the major

| Electives in disciplines other than the major | (6) |

**INSTRUMENTAL MAJORS**

Other Supportive Courses

| History and Literature | (3) |
| Theory and Composition | (6) |
| Music Electives (other than performance) | (3) |
| Music 414 (required for Keyboard Performance majors) | (3) |

Electives in disciplines other than the major

| Electives in disciplines other than the major | (11) |

### BACHELOR OF MUSIC WITH A MAJOR IN MUSIC EDUCATION (Instrumental or Choral Emphasis)

Required 132 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4 year institution) including:

I. General Education Requirements (see University GER listing).

II. The Following Curriculum:

<table>
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<th>Core Courses</th>
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<tr>
<td>Musc 130, 134, 230, 234 ... Harmony and Theory Sequence ... (12)</td>
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<tr>
<td>Musc 131, 135, 231, 235 ... Aural Skills Sequence ... (4)</td>
</tr>
<tr>
<td>Musc 203 ... Popular and Classical Musics of the World ... (3)</td>
</tr>
<tr>
<td>Musc 310, 311, 312 ... Music History Survey I, II, III ... (9)</td>
</tr>
<tr>
<td>Musc 256 ... Basic Conducting ... (2)</td>
</tr>
<tr>
<td>Piano Proficiency through Level III or</td>
</tr>
<tr>
<td>Musc 133, 136, 233, 236 ... Keyboard Skills Sequence ... (4)</td>
</tr>
</tbody>
</table>

**INSTRUMENTAL EMPHASIS**

Other studies

| Musc 423 ... Instrumental and Choral Arranging ... (2) |
| Musc 427 ... Analysis of Musical Form ... (2) |
| Musc 417 ... Instrumental Literature ... (2) |

Performance Courses

| 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) |
Music Education
Musc 140 ……………………………… Methods: Woodwinds, Brass, Strings, Percussion. (5)
Musc 446 ……………………………… Instrumental Methods. (3)

Music Technology
Musc 340 ……………………………… Introduction to Music Technology (Credits apply toward T&L 390). (2)

VOCAL/CHORAL EMPHASIS

Other studies
Musc 423 ……………………………… Instrumental and Choral Arranging. (2)
Musc 427 ……………………………… Analysis of Musical Form. (2)
Musc 416 ……………………………… Choral Literature. (2)

Performance
Major Instrument. ……………………………… (7)
Major Choral Ensemble. ……………………………… (7)
Voice or Piano as a secondary instrument (may include the above 2 major areas). (4)
Musc 357, 358 ……………………………… Choral, Instrumental Conducting. (4)
Musc 459 ……………………………… Senior Recital. (1)

Majors
Musc 140 ……………………………… Methods: Woodwinds, Brass, Strings, Percussion. (4)
Musc 242 ……………………………… Diction for Singers. (1)
Musc 445 ……………………………… Choral Methods. (3)

Music Technology
Musc 340 ……………………………… Introduction to Music Technology (Credits apply toward T&L 390). (2)

PROFESSIONAL EDUCATION

T&L 200, 286, 300, 390 (or Musc 340), T&L 350 (or 252), 400, 425, 433 (or IS 121), T&L 460, 486, 487 (See adviser for clarification.)

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:

1. General Education Requirements (see University GER listing).

II. The Following Curriculum:

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. (9)

Piano Proficiency Level I or Musc 133 ……………………………… Keyboard Skills I. (1)

Other Supportive Courses
Performance (one instrument or voice) ……………………………… (4)
Major Ensemble ……………………………… (4)
Electives in Theory/Comp. History/Lit. or Applied. (7)
Musc 492 ……………………………… Senior Project. (2)

Requisites in other departments:
Foreign language: ……………………………… (16)
Level IV proficiency in a foreign language (preferably French, German, or Italian). Eighteen credits of the required 125 must be in disciplines other than the major (in addition to University General Education and language requirements).

MUSIC THERAPY EMPHASIS

Required 130 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

I. General Education Requirements (see University GER listing).

II. The Following Curriculum:

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-III. (9)

Supporting Courses in Music
Applied lessons (one instrument or voice) ……………………………… (6)
Musc 150, 151 ……………………………… Class Lessons: Guitar. (2)
Musc 150, 151 (Class Lessons: Voice) and/or. (2)
Musc 140 (Methods: Percussion). (4)
Piano Proficiency through Level III or Musc 133, 136, 233, 236. (4)
Major Ensemble ……………………………… (4)
Musc 256 ……………………………… Basic Conducting. (2)
Musc 423 ……………………………… Instrumental and Choral Arranging. (2)
Musc 340 ……………………………… Intro to Music Technology. (2)
Musc 446 ……………………………… Instrumental Methods. (3)

Music Therapy Courses
Musc 180 ……………………………… Intro 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 ……………………………… Psychology of Music. (3)
Musc 481 ……………………………… Music Therapy Practicum IV. (1)
Musc 482 ……………………………… Music Therapy Internship. (3)

Additional Required Courses
Anat 204 ……………………………… Anatomy for Paramedical Personnel. (3)
Anat 204L ……………………………… Anatomy for Paramedical Personnel Lab. (2)
Anat 204L ……………………………… Anatomy for Paramedical Personnel Lab. (2)
Anat 204 ……………………………… Anatomy for Paramedical Personnel. (3)

MINOR IN MUSIC

Required 21 credits:
Musc 100 ……………………………… Introduction to the Understanding of Music (May be waived by examination). (3)

Core Courses
Musc 130, 134 ……………………………… First-year Harmony and Theory. (6)
Musc 131, 135 ……………………………… First-year Aural Skills. (2)
Musc 310, 311, 312 ……………………………… Music History Survey I, II, III. (9)

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, 312)

College of Education and Human Development

B.S.E.D. WITH COMBINED MAJOR IN ELEMENTARY EDUCATION AND MUSIC

Required 127-134 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.

IV. The Following Music Curriculum:

Musc 100 ……………………………… Introduction to the Understanding of Music (May be waived by examination). (3)

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. (9)
Musc 256 ……………………………… Basic Conducting. (2)

Performance
Major Instrument. ……………………………… (6)
Electives in Theory/Comp. History/Lit. or Applied. (4)

Voice Lessons or Voice Class— Piano and Instrumental Principles Only. (1-3)
Piano Lessons or Musc 133, 136, 233, 236 ……………………………… Keyboard Skills — Voice and Instrumental Principles Only. (4)
Musc 357 ……………………………… Choral Conducting. (2)
Musc 444 ……………………………… Applied Music Pedagogy (vocal). (2)

Music Education
T&L 425 ……………………………… Methods &Materials in Elementary Music. (3)
T&L 486 ……………………………… Field Experience. (1)

MINOR IN MUSIC

Required 23 credits:
Musc 100 ……………………………… Introduction to the Understanding of Music (May be waived by examination). (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 or 312 ……………………………… Music History Survey I, II, III. (3)
Additional Courses
Applied Music.................................(4-5)
Ensembles.................................(2-3)
TiL & 426............Elem 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. F S

399. Special Topics. 1 to 3 credits. Consent of instructor required. Specially arranged seminar series, topics not covered by regular departmental offerings. May be repeated for credit up to 6 hours. F S

491. Seminar. 3 credits. Prerequisite: Consent of instructor. On Demand.

493. Honor Projects. 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 S

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 S

133. Keyboard Skills I. 1 credit. Beginning classroom instruction in keyboard. F S

134. Chromatic Harmony I. 3 credits. Prerequisite: Musc 130. The introduction of chromatic material 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, and in keyboard sight reading. F S

136. Keyboard Skills II. 1 credit. Prerequisite: Musc 133. Intermediate classroom instruction in keyboard. S

230. Chromatic Harmony II. 3 credits. Prerequisites: Musc 134, 135. The continued study of chromatic materials covered in Musc 134. Material is learned through part writing, keyboard skills, and music analysis. F

231. Advanced Aural Skills. 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. F

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 choirs. Specific areas of focus to be determined by abilities and interests of the students. S


427. Analysis of Musical Form. 2 credits. Prerequisite: Musc 230. Analysis of the principal forms of musical composition. S


429. Composition. 2 credits (repeatable). Prerequisite: Musc 112. 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, including Native American, Jazz, Popular, and World music. F

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.

210. Music History Survey I. 3 credits. Prerequisite: Musc 134 or instructor’s permission. A survey of western music history from Ancient Times through the Middle Ages and Renaissance. S

211. Music History Survey II. 3 credits. Prerequisite: Musc 134 or permission of the instructor. A survey of western music history of the Common Practice Period, including Baroque, Classical, and Early Romantic music. F

212. Music History Survey III. 3 credits. Prerequisite: Musc 134 or permission of the instructor. A historical survey of western art music from late Romantic innovations to the present day. S

414. Piano Literature. 3 credits. Prerequisite: Musc 354 or 355. Piano, or consent of the instructor. Study and analysis of keyboard music from the romantic period to the present, with attention to the development of forms, techniques, and styles. S

415. Song Literature. 2 credits. Prerequisite: Musc 254 or 255. Voice. Representative song literature of Italy, France, Germany, England, Russia, Norway, 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. 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. Prerequisite: 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 S

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 180 Corequisite: Musc 281. This practicum offers the student supervised field experience in music therapy within the public school. The student will have 30 contact hours co-leading a music therapy group for special needs children. In addition to field placement, the student must attend a weekly on-campus seminar. S

380. Music Therapy Theories and Methods II (Adults). 3 credits. Prerequisite: Musc 280. In-depth demonstration, analysis and comparison of specific music therapy models, a study of the theories, methods and techniques associated with these models, with special emphasis on the treatment of adults. F

381. Music Therapy 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

382. Music Therapy Practicum II. 1 credit. Prerequisite: Musc 282. Corequisite: Musc 381. This practicum offers the student supervised field experience in music therapy with the institutionalized elderly. The student will have 30 contact hours co-leading a music therapy group. 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 emotionally disturbed adolescents. The student will have 30 contact hours co-leading a music therapy group. In addition to field placement, the student must attend a weekly on-campus seminar. S

480. Psychological Foundations of Music Learning. 3 credits. Prerequisite: Musc 383. 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. F

481. Music Therapy Practicum IV. 1 credit. Prerequisite: Musc 383. This practicum offers the student supervised field experience in music therapy within the public school. The student will have 30 contact hours divided between leading a music therapy group and working individually with a single client. In addition to field placement, the student must attend a weekly on-campus seminar. F S

482. Music Therapy Internship. 3 credits. Prerequisites: Unless otherwise indicated, music therapy courses are open only to those admitted to the Music Therapy Program, or with the consent of the instructor. Completion of all music therapy course work. Six-month clinical experience in an American Music Therapy Association approved facility at the completion of all music therapy course work. Student must complete 1040 clock hours. The internship is a degree requirement, offering the student supervised field experience under the guidance of a professional music therapist. S

Music Education
140. Methods: Woodwinds, Brass, Strings, Percussion. 1 credit, repeatable to 6 credits. Prerequisite: Music majors and minors only. Offers music education students performance and pedagogical instruction on instruments in the brass, woodwind, string and percussion families. F S

243. Music for Elementary School Teachers. 3 credits. Not open to Music Majors or Minors. Survey of elementary school music, development of teacher skills and knowledge emphasizing conceptual understandings and music competencies essential in the musical growth of children. F S

445. Choral Methods. 3 credits. F/V
446. Instrumental Classroom Methods and Materials. 3 credits. S/2
447. Jazz Techniques. 2 credits. Prerequisite: Musc 140. Organization of and materials appropriate for the jazz band, methods of teaching the rhythmic and tonal problems inherent in its style. On Demand.

448. Orchestra Directors’ Course. 1 credit. Organizational and administrative problems of the orchestra director such as curriculum, recruiting, scheduling, programming, promotion of the string program, and literature. On Demand.

449. Music Education Special Projects Course. 1 to 3 credits. F/S

Music Performance

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 256 and successfully passing Keyboard Skills II. Conducting problems and rehearsal techniques in relation to choral literature in various styles based on score, class performance, and recordings. S/2

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/2

b. Pedagogy

438. Music in the Junior High School. 1 to 4 credits. On demand.

444. Applied Music Pedagogy. 2 credits. Prerequisite: 5 semester hours 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/V, Voice F/V, 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. F/S

261. University Chamber Choir. 1 credit. F/S

263. Varsity Bands. 1 credit. F/S

264. Women’s Chorus. 1 credit. F/S

266. Old English Christmas Feast. 1 credit. Participation in all scheduled activities for the Old English Christmas Feast, to include singing (large groups and strolling minstrels), serving meals, acting, and ushering. F

269. Opera Workshop. 1 credit. Production and presentation of chamber operas, scenes from larger works, and major productions, fully staged and costumed. Permission of instructor. On demand.

270. Wind Ensemble. 1 credit. F/S

271. University Band. 1 credit. F/S

272. Marching/Athletic Band. 1 credit. The Pride of the North Band is open to all students on campus, and performs on the field and in the stands at all home games for the UND football, men’s and women’s basketball, and hockey teams. F

273. Instrumental Jazz Ensemble. 1 credit. F/S

274. Symphony Orchestra. 1 credit. F/S

275. University Chamber Orchestra. 1 credit. On Demand.

276. Collegium Musicum. 1 to 4 credits. On Demand.

277. Chamber Music Groups. 1 credit. Any combination of strings, brass, woodwind, voices, 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 applications of pronunciation of two of the major languages used in song literature: Italian/English or French/German. May be repeated for credit up to 2 hours. F/V/S/S

e. Applied Music (Individual Lessons*)

153. Individual Lessons for Non-Majors. 1 credit. F/S

154. Individual lessons. 1 credit. Half hour lesson. F/S

155. Individual lessons. 2 credits. Full hour lesson. For Bachelor of Music in Performance students and others by permission of instructor. F/S

254. Individual lessons. 1 credit. Prerequisite: Musc 154. Half hour lesson. F/S

255. Individual lessons. 2 credits. Prerequisite: Musc 155. Full hour lesson. For Bachelor of Music in Performance students and others by permission of instructor. F/S

354. Individual lessons. 1 credit. Prerequisite Musc 254. Half hour lesson. F/S

355. Individual lessons. 4 credits. Prerequisite: Musc 255. Full 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. Half hour lesson. F/S

455. Individual lessons. 4 credits. Prerequisite: Musc 355. Full hour lesson. For Bachelor of Music in Performance students and others by permission of instructor. F/S

459. Senior Recital. 1 credit. Prerequisite: Musc 354 or 355. Corequisite: Musc 454 or 455. The presentation of a senior recital. S-U 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.

Nursing (Nurs)


College of Nursing

The baccalaureate program of the University of North Dakota College of Nursing provides a sound background of liberal education, preparation in all basic areas of clinical nursing practice, and a solid foundation for graduate education. The graduate receives the Bachelor of Science in Nursing (B.S.N.) degree and is eligible to take national board examinations for registered nurse licensure. UND Nursing programs are accredited by the National League for Nursing Accrediting Commission, have initial approval from the Commission on Collegiate Nursing Education and are approved by the North Dakota State Board of Nursing.

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 six credits of other electives. A minimum of three (3) of the General Education requirements must meet the World Culture designation. It is recommended that students try to complete a portion of these prior to admission to nursing), see University GER listing.

II. College of Nursing Degree Requirements (see College of Nursing listing).

IV. The Following Curriculum

Freshman Year (Pre-Nursing)

*Engl 110...........College Composition I..................................(3)
*Chem 115, 115L....Introductory Chemistry and Laboratory..............(4)
*Chem 116, 116L....Introduction to Organic and Biochemistry and Laboratory..................................................(4)
*Anat 121...........Anatomy for Paramedical Personnel....................(3)
*Anat 204L............Anatomy Laboratory.................................................(2)
*Psych 111.........Introduction to Psychology.................................(3)
*Psych 210............Anatomy of Behavioral Science.......................(3)
*Soc 115.............Introduction to Sociology.....................................(3)
*Soc 151.............Social Problems......................................................(3)
*Anth 211.............Cultural Anthropology..............................................(3)
*Engl 220............College Composition II........................................(3)
*Engl 225.............Technical and Business Writing...........................(3)

****Electives/Arts & Humanities/World Culture
### Sophomore Year

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Physiology</strong> ........................................ (4)</td>
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<tr>
<td><strong>Microbiology/Lab</strong> ................................ (5)</td>
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<tr>
<td>Nurs 233.......Nursing and Professionalism........................................... (1)</td>
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<tr>
<td>Nurs 280.......Introduction to Clinical Nursing........................................... (3)</td>
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<tr>
<td>Nurs 360.......Health Assessment Techniques........................................... (3)</td>
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<tr>
<td><strong>Pharm 315</strong> ......Introduction to Pharmacology........................................... (3)</td>
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<tr>
<td>Psy 250.......Developmental Psychology........................................... (4)</td>
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<td>Nurs 240.......Fundamentals of Nutrition........................................... (3)</td>
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<td>Nurs 230.......Personal and Group Dynamics........................................... (2)</td>
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<td>Nurs 288.......Introduction to Adult Health Nursing........................................... (4)</td>
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#### Electives/Arts & Humanities/World Culture

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<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>Psych 270....Abnormal Psychology........................................... (3)</td>
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<td>Nurs 320....Therapeutic Nutrition in Nursing........................................... (1)</td>
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<td>Nurs 328....Adult Health Nursing........................................... (4)</td>
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<td>Nurs 382....Adult Health Clinical........................................... (4)</td>
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<td>Nurs 383....Childbearing Nursing I........................................... (2)</td>
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<td>Nurs 384....Child Health Nursing I........................................... (2)</td>
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<tr>
<td>Nurs 385....Childbearing Nursing II........................................... (2)</td>
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<tr>
<td>Nurs 386....Child Health Nursing II........................................... (2)</td>
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<tr>
<td>Nurs 387....Family in the Community........................................... (3)</td>
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<tr>
<td>Soc 326....Statistics or Econ 210 Intro to Business &amp; Econ Statistics........................................... (3)</td>
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<td>Nurs 392....Nursing Research........................................... (3)</td>
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### Junior Year

#### Electives/Arts & Humanities/World Culture

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>NURS 401....Abnormal Psychology........................................... (3)</td>
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<tr>
<td>Nurs 478....Leadership and Management........................................... (3)</td>
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<td>Nurs 448....Community Health Nursing........................................... (3)</td>
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<td>Nurs 481....MultiSystem Complex Nursing Clinical........................................... (3)</td>
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<td>Nurs 488....Nursing Practicum........................................... (2)</td>
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<td>Nurs 498....Nursing Practicum........................................................................ (1-4)</td>
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<tr>
<td>Nurs 440....Trends in Nursing........................................... (2)</td>
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<tr>
<td>Nurs 486....Mathematical Mental Health Nursing........................................... (4)</td>
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*Required Courses for Admission to the Nursing major*

**Must be taken Spring Semester.

### RN/BSN OPTION — NURSING CURRICULUM SEQUENCE

Students in the RN/BSN Option program may attend classes either full or part time. Where possible, classes are scheduled to allow RN’s to take classes on just one day a week if they wish. The courses listed are the course work remaining for most RN/BSN students after transfer of AD nursing credit or successful completion of the NLN Accelerated Challenge Exam II (ACE II). At least 30 semester credits of UND nursing course work are required. In addition, students must complete all UND General Education Requirements and College of Nursing pre-requisites to meet graduation requirements. Support courses and NLN Challenge Exams should be completed before beginning College of Nursing courses.

### Suggested Fall Semester Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Nurs 361....New Concepts in Nursing I........................................... (3)</td>
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<tr>
<td>Nurs 392....Nursing Research........................................... (3)</td>
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<tr>
<td>Nurs 360....Health Assessment Techniques........................................... (3)</td>
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<tr>
<td>Nurs 448....Community Health Lecture........................................... (3)</td>
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<tr>
<td>Nurs 484....Community Health Clinical........................................... (3)</td>
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### Suggested Spring Semester Courses

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>Nurs 362....New Concepts in Nursing II........................................... (4)</td>
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<tr>
<td>Nurs 440....Trends in Nursing........................................... (2)</td>
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<tr>
<td>Nurs 478....Leadership and Management........................................... (3)</td>
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### Elective Nursing Courses

A minimum of six credits are to be chosen from the courses listed below. The six credits must include at least three credits of a course with a clinical component. Nurs 394 Independent Study and Nurs 389 Senior Honors can be designated to include clinical components. Nurs 387 Family in the Community and Nurs 481 Multisystem Complex Are the major components of the Clinical Knowledge component. Adult Health each contain clinical components.

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>Nurs 320....Therapeutic Nutrition........................................... (1)</td>
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<td>Nurs 387....Family in the Community........................................... (1)</td>
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<td>Nurs 390....Transcultural Nursing........................................... (3)</td>
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<td>Nurs 394....Independent Study........................................... (1-4)</td>
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<td>Nurs 400....Special Topics........................................... (2-3)</td>
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<tr>
<td>Nurs 481....Multisystem Complex AH........................................... (4)</td>
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<td>Nurs 498....Nursing Practicum........................................... (1-4)</td>
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<td>Nurs 488....Nursing Practicum Theory........................................... (2)</td>
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<tr>
<td>Nurs 489....Seniors Honors........................................... (6-15)</td>
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<td>Nurs 418....Physical Changes in Aging........................................... (3)</td>
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<td>Nurs 483....Mental Health........................................... (4)</td>
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<td>Nurs 501....Complementary Therapies........................................... (3)</td>
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### Senior Year

#### Electives/Arts & Humanities/World Culture

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<tr>
<td>Nurs 478....Leadership and Management........................................... (3)</td>
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<tr>
<td>Nurs 448....Community Health Nursing........................................... (3)</td>
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<tr>
<td>Nurs 484....Community Health Nursing Clinical........................................... (3)</td>
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<tr>
<td>Nurs 481....MultiSystem Complex AD Adult Health ........................................... (4)</td>
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<td>Nurs 488....Nursing Practicum Theory........................................... (2)</td>
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<td>Nurs 498....Nursing Practicum........................................................................ (1-4)</td>
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<tr>
<td>Nurs 440....Trends in Nursing........................................... (2)</td>
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<tr>
<td>Nurs 483....Mental Health Nursing........................................... (4)</td>
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</table>

*Required Courses for Admission to the Nursing major

**Must be taken Spring Semester.

### 1st Semester — Fall

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>@Nurs 320....New Concepts in Nursing I...........................................</td>
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<tr>
<td>@Nurs 392....Nursing Research...........................................</td>
<td>(1)</td>
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<tr>
<td>@Nurs 230....Intro to Clinical Nursing...........................................</td>
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<td>Nurs 387....Family in the Community...........................................</td>
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<td>Nurs 501....Complementary Therapies...........................................</td>
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### 2nd Semester — Spring

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<td>@Nurs 392....Nursing Research...........................................</td>
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<tr>
<td>@Nurs 230....Intro to Clinical Nursing...........................................</td>
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<tr>
<td>Nurs 387....Family in the Community...........................................</td>
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### 3rd Semester — Fall

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<tr>
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<tr>
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<td>Nurs 387....Family in the Community...........................................</td>
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<td>Nurs 481....Multisystem Complex AH...........................................</td>
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<td>Nurs 488....Nursing Practicum Theory...........................................</td>
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<td>Nurs 270....Abnormal Psych...........................................</td>
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### 4th Semester — Spring

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>Nurs 385....Childbearing II...........................................</td>
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<tr>
<td>Nurs 386....Child Health II...........................................</td>
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<tr>
<td>Nurs 392....Nursing Research...........................................</td>
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<td>Nurs 387....Family in the Community...........................................</td>
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<tr>
<td>Nurs 481....Multisystem Complex AH...........................................</td>
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<tr>
<td><strong>Electives/Arts &amp; Humanities/World Culture</strong>...........................................</td>
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### 5th Semester — Fall

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<tr>
<th>Course Code</th>
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<tr>
<td>Nurs 448....Comm Health Lect...........................................</td>
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<td>Nurs 484....Comm Health Clinic...........................................</td>
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<tr>
<td>Nurs 478....Leadership/Management Theory...........................................</td>
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<td>Nurs 481....Multisystem Complex AH...........................................</td>
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<td><strong>Electives/Arts &amp; Humanities/World Culture</strong>...........................................</td>
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### 6th Semester — Spring

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>Nurs 440....Trends in Nursing...........................................</td>
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<tr>
<td>Nurs 483....Mental Health...........................................</td>
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<tr>
<td>Nurs 488....Nursing Practicum...........................................</td>
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*Should be completed prior to admission to the College of Nursing.

**A.D. transfer credit or Mobility Exams meet or waive these requirements.

### 129 semester credits are required for graduation.
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.

230. Personal and Group Dynamics, 2 credits. Focus is on awareness and use of self as a holistic person and as a professional, on communication and interviewing skills, and on the role of group processes in promoting personal and professional growth. Seminar. F,S. Open to non-majors.

233. Nursing and Professionalism, 1 credit. Characteristics of a profession, a professional, and professional nursing practice as well as the evolution of nursing as a profession are explored. Seminar. F,S. Open to non-majors.

280. Introduction to Clinical Nursing, 3 credits. Pre- or Co-requisites: Nurs 360, 233, 301. Focus is on the theories, concepts, behaviors, and intervention skills basic to professional nursing practice. Use of the nursing process is emphasized in the care of adults, particularly in the middle and older developmental stages. Lecture/clinical/lab. Open only to the Nursing Program. F,S

288. Introduction to Adult Health Nursing, 4 credits. Prerequisites: Nurs 233, 280, 360, Mbio 202, 202L, Psy 250. Corequisites: Phm 315, Nutr 240, Mbio 202, Psy 250. Focus is on the theories, concepts, behaviors, and intervention skills basic to professional nursing practice. Use of the nursing process is emphasized in the care of adults, particularly in the middle and older developmental stages. Laboratory seminars and clinical experience. Lecture/discussion laboratory clinical. F,S

320. Therapeutic Nutrition in Nursing, 1 credit. Prerequisites: Nutr 240 and Nurs 360. Focus is on nutrition interventions related to the holistic care of adults while incorporating the nursing process. Nutrition concepts in promoting, maintaining and restoring optimal health are explored. Lecture/discussion. F,S


360. Health Assessment Techniques, (CCN) 3 credits. Pre- or Co-requisites: Phv 301 or consent of instructor. Within the nursing process, the emphasis is on holistic assessment of the health status of adults. Lecture/discussion/clinical experience. F,S

361. New Concepts in Nursing Practice I, 3 credits. Prerequisite: RN or consent of instructor. Topics, including the College of Nursing Philosophy, are selected to prepare RN/BSN nursing students for their role as professional nurses. Special issues in nursing practice are analyzed as they relate to the role of the professional nurse in the ever-changing health care system. Open to pre-nursing RNs. F,S

362. New Concepts in Nursing Practice II, 4 credits. Prerequisite: RN or consent of instructor. Topics, including the College of Nursing Philosophy, are selected to prepare RN/BSN nursing students for their role as professional nurses. Special issues in nursing practice are analyzed as they relate to the role of the professional nurse in the ever-changing health care system. Open to pre-nursing RNs. F,S

382. Adult Health Nursing, 4 credits. Pre- or Co-requisites: Nurs 360, 387, and 392. Focus is on nutrition interventions related to the holistic care of adults while incorporating the nursing process. Nutrition concepts in promoting, maintaining and restoring optimal health are explored. Lecture/discussion laboratory clinical experience. F,S

383. Childbearing Nursing I, 2 credits. Pre- or Co-requisites: Nurs 382. Focus is on nursing care for health maintenance and health promotion during childbearing. Lecture/clinical. F,S

384. Child Health Nursing I, 2 credits. Pre- or Co-requisite: Nurs 383. Focus is on nursing care for health maintenance and health promotion during childhood. Lecture/clinical. F,S

385. Childbearing Nursing II, 2 credits. Prerequisite: Nurs 383. Focus is on nursing care during illness and health restoration during childbearing. Lecture/clinical. F,S

386. Child Health Nursing II, 2 credits. Prerequisite: Nurs 384. Focus is on nursing care during illness and health restoration during childhood. Lecture/clinical. F,S

387. Family in the Community, 3 credits. Prerequisite or Co-requisites: Nurs 385 and 386. Focus is on family-centered, community-based services for expectant families and families caring for children with special needs. Emphasis is on the overall health of the family withspecial needs. Lecture/clinical. F,S

388. Honors Tutorial, (CCN) 3-6 credits. Supervised independent study in Nursing for students enrolled in the 5-year Honors Program. F,S

392. Research, (CCN) 3 credits. Pre- or Co-requisite: Statistics. Introduction to nursing research with a focus on the interrelationship among nursing practice, theory and research. Lecture/Discussion. F,S

394. Independent Study (CCN) 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 Education, (CCN) 1-2 credits per semester. Prerequisites: Completion of all sophomore year courses and a 2.5 overall GPA. A reality experience in nursing incorporating clinical work experience and evaluation. Designed to enhance the student’s prior course work in nursing. Qualified nursing students are employed by selected health care agencies either during the summer or academic year. Hours are arranged within the guideline of 10 hours per week. SU grading only. F,S,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. F,S. Open to non-majors. S

440. Trends, 2 credits. Prerequisite: Nurs 387. Trends, controversies and other issues in nursing and health care delivery are explored. Seminar. F,S

448. Community Health Nursing, 3 credits. Prerequisites: Nurs 387 and 392. Focus is on the health of the community. An emphasis is placed on the use of assessment tools and models, the epidemiological approach and various health screening procedures to promote health. The utilization of community resources, collaboration and coordination of services within the health care system are explored as a means of assessing quality, accessibility and continuity of health care. Lecture/Discussion. F,S

478. Leadership and Management, 1 to 3 credits. Prerequisites: Nurs 392 and 387. Focus is on the management and leadership roles of the professional nurse in the delivery of comprehensive health care. Seminar. F,S

481. Multisystem Complex Adult Health, 4 credits. Pre- or Co-requisites: Nurs 478 and 484. Focus is on the management of nursing care of adults with multisystem health problems. Lecture/Discussion/clinical. F,S

483. Mental Health Nursing, 4 credits. Prerequisites: Nursing 478 and Psy 270. Focus is on promotion, maintenance, and restoration of mental health throughout the life cycle while practicing as a caring, collaborative, professional nurse. Lecture/ Seminar/clinical. F,S

484. Community Health Nursing — Clinical, 3 credits. Prerequisite or Co-requisite: Nursing 448. Focus is on the health of communities, families and individuals. Emphasis is placed on providing comprehensive health care through the use of various community health roles. Laboratory/clinical. F,S

488. Nursing Practicum Theory, (CCN) 2 credits. Prerequisite: Nurs 481. Role transition, the socialization process, and research and theory related to the legal, ethical, and evaluation issues are emphasized. Preparation for assuming beginning or enhanced positions within the nursing profession. Lecture/Discussion. F,S

489. Senior Honors Thesis, (CCN) 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,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 biologic, psychological, and sociological aspects of clients of selected cultural groups and identify their specific health care values and practices. F,S

498. Nursing Practicum, (CCN) 1 to 4 credits. Pre- or Co-requisite: Nurs 488. Emphasis is on the role transition process involved in establishing oneself in a position within an agency as well as integrating the many aspects of the role of a professional nurse. Clinical. F,S

Nutrition and Dietetics

The mission of the Department of Nutrition and Dietetics is to offer theoretical and experiential preparation for professionals. The professional programs offered include:

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. 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. Graduates completing N&D 441 — Advanced Nutrition are eligible to become Licensed Nutritionists (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 clinical 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 on Higher Education Accreditation and the United States Department of Education.

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. College of Nursing Requirements (see College of Nursing listing).

III. Prerequisite Courses:

* Chem 121, 122L. General Chemistry I & II and Laboratories (8)
* Chem 240, 240L. Survey of Organic Chemistry and Laboratory (5)
* BiCh 301. Biochemistry (3)
* Anat 204 and 204L. Anatomy for Paramedical Personnel and Laboratory (5)
* or Biol 150, 150L. General Biology I and Laboratory (4)
* Psy 101. Mechanics of Human Physiology (4)
* Math 103. College Algebra (3)
* Mkt 201. Personal Marketing (3)
* Soc 326. Sociological Statistics (3)
* or Psy 241. Introduction to Statistics (4)
* Comm 100. Fundamentals of Public Speaking (3)
* Comm 212. Interpersonal Communication (3)
* Comm 366. Business and Professional Speaking (3)
* or Swk 200. Introduction to Helping Skills (2)


IV. Required Courses:

* N&D 100. Introduction to Nutrition and Dietetics (1)
* N&D 200. Nutrition Promotion Strategies (1)
* Nutr 240. Fundamentals of Nutrition (3)
* N&D 241. Maternal and Child Nutrition (2)
* Nutr 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 494. Research in Nutrition and Dietetics (1)

V. 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 (3)
* N&D 441. Advanced Nutrition (4)
* N&D 494. Research in Nutrition and Dietetics (2)

Option B:

* Soc 335. The Family (3)
* PEXS 317. Fitness for Life (3)
* N&D 348. Sports Nutrition (1)
* Soc 355. Drugs and Society (3)
* or Phrm 315. Introduction to Pharmacology (3)

* Mgmt 305. Managerial Concepts may be substituted for N&D 340 and 440.

VI. Electives or minor.

In consultation with advisor, 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. College of Nursing Requirements (see College of Nursing listing).

III. The Following Curriculum:

Pre-professional Requirements:

Anat 204 and 204L. Anatomy for Paramedical Personnel and Laboratory (5)

* Biol 150, 150L. General Biology I and Laboratory (4)
* Chem 121, 122L. General Chemistry I, II and Laboratories (8)
* Chem 240, 240L. Intro. to Organic & Biochemistry/Lab (4)
* Math 103. College Algebra (3)
* Mbio 302/302L. General Microbiology and Laboratory (4)
* Mkt 201. Personal Marketing (3)
* N&D 100. Introduction to Nutrition and Dietetics (1)
* N&D 200. Nutrition Promotion Strategies (1)
* Nutr 240. Nutrition in the Aging Process (2)
* N&D 300. Fundamentals of Nutrition (3)
* N&D 335. World Food Patterns (3)
* Psy 301. Mechanics of Human Physiology (4)
* Psy 111. Introduction to Psychology (3)
* Psy 241. Introduction to Statistics (4)
* or Soc 326. Sociological Statistics (3)
* Swk 200. Introduction to Helping Skills. (2)

Professional Dietetics Requirements:

* BioCh 301. Biochemistry (3)
* Mgmt 305. Managerial Concepts (3)
* N&D 241. Maternal and Child Nutrition (2)
* N&D 242. Nutrition in the Aging Process (2)
* N&D 300. Orientation to Dietetics (1)
* N&D 340. Foodservice Systems Production (3)
* 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 491. Research in Nutrition and Dietetics (3)
* N&D 498. Supervised Practice Experiences in 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.

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

N&D 100. Introduction to Nutrition and Dietetics (1)
* N&D 200. Nutrition Promotion Strategies (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 260. Principles of Foods & Food Science (5)
* N&D 335. World Food Patterns (3)
* N&D 340. Foodservice Systems Production (3)
* N&D 342. Community Nutrition (3)
* N&D 348. Sports Nutrition (1)
* N&D 397. Cooperative Education (1-2)
* N&D 400. Professional Issues (2)
* N&D 440. Foodservice Systems Management (1)
* N&D 441. Advanced Nutrition (4)

* A maximum of 4 credits from this list of courses may be counted in the minor.
* Chem 116/116L. Intro. to Organic & Biochemistry/Lab (4)
* Chem 240/240L. Survey of Organic Chemistry/Lab (5)
* BioCh 301. Biochemistry (3)
* Mbio 302/302L. General Microbiology/Lab (5)

Other courses may be counted toward the minor with written approval of a faculty member in the Department of Nutrition and Dietetics.
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. 1 credit. 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

240. Fundamentals of Nutrition. (CCN) 3 credits. Basic principles of nutrition with application for individuals and family groups. F,S

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, nutritional and menu planning and food sanitation. Application of scientific principles in relationship to food composition, physical properties and chemical reactions. S

300. Introduction to Dietetics. 1 credit. Prerequisite: Admission to the dietetic program. Study of the profession of dietetics and its relationship to health care systems including professional concerns and ethical issues. S

335. World Food Patterns. 3 credits. Examination of the food patterns of selected world population groups considering the effect of social, cultural, and economic practices on nutritional values. F

340. Foodservice Systems Production. 3 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

341. 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 & Phy 301. Overview of the specialized nutritional needs of the athlete. S

350. Medical Nutrition Therapy I. 2 credits. Prerequisites: N&D 241, 242 and Phy 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. F,S,S

400. Professional Issues. 2 credits. Prerequisites: Senior status and consent of instructor. Analysis of professional issues including but not limited to grantmanship, marketing, professional presentations and complementary therapies in nutrition and dietetics. Development of skills to address such issues. S

440. Foodservice Systems Management. 1 credit. Prerequisite: N&D 340. Apply 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 Phy 301 or PEHS 455. 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. F

491. Dietetic Seminar. 1 credit. Prerequisite: Senior standing in Dietetics. Class members will plan, prepare, present and evaluate a seminar for a professional audience. S

494. Research in Nutrition and Dietetics. 1-4 credits (repeatable to 6 credits). Prerequisite: Senior status with completion of a statistics course and a minimum of 12 credits in nutrition and dietetics. Study and application of research designs and procedures appropriate to nutrition and dietetics. F,S

498. Supervised Practice in Dietetics. 1 credit, repeatable to 24. 498A, regular grading and 498B, S/U grading. Prerequisite: Consent of instructor one semester prior to enrollment. Development of professional skills and competencies through planned learning experiences in which knowledge and theory are applied to simulated and real-life situations in dietetics. F,S

499. Special Topics in Nutrition and Dietetics. 1-4 credits (repeatable to a maximum of 6 credits). Prerequisite: Consent of instructor. Special topics and/or indepth independent study in selected content areas relative to nutrition and dietetics. On demand.

Occupational Safety and Environmental Health (OSEH)

Diez (Program Coordinator)

The Occupational Safety and Environmental Health (OSEH) program is a 58-credit major leading to the baccalaureate degree, bachelor of science. The OSEH program is administered by the Faculty of Industrial Technology. It has a 30-credit core of interdisciplinary course work, which provides a sound professional background. The remaining 28 credits are selected from one of two technical concentrations: Industrial Safety or Industrial Hygiene. The degree program draws course work from 12 academic departments and utilizes resources from the University’s Office of Occupational 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 credits of course work.

B. A student must have completed the following courses (or equivalents) with a minimum grade of C:

- Chemistry 121 & 122 and Laboratories ............................................... (8)
- Math 103 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . (3)
- BVED 217 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . (4)
- Phys 161 and Laboratory . . . . . . . . . . . . . . . . . . . . . . . . . . . . . (4)
- Biol 150-151 & Laboratories . . . . . . . . . . . . . . . . . . . . . . . . . . . (8)

C. A student must have completed 15 credits in residence at the University of North Dakota with a minimum 2.20 GPA. Transfer students will have official transcripts evaluated to determine the 15-credit 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 course work. (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). 

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 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:

General Core: (Required) 33 credit hours

58 credits to include:

- Math 140......Applied Calculus I .............................................. (3)
- Anat 204 ......Anatomy for Paramedical Personnel.................. (3)
Industrial Technology and the College of Business and Public Administration.

Students must achieve the following to graduate with the Bachelor of Science in
Health major.

### INDUSTRIAL SAFETY CONCENTRATION (OPTION I)

Required: 27 credits including:

1. The following 15 credits:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 209</td>
<td>Quantitative Analysis</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 240</td>
<td>Survey of Organic Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>OSH 405</td>
<td>Industrial Hygiene</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 410</td>
<td>Drugs Subject to Abuse</td>
<td>2</td>
</tr>
<tr>
<td>OSH 440</td>
<td>Industrial Safety</td>
<td>3</td>
</tr>
</tbody>
</table>

2. 12 credits selected from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 122</td>
<td>Computer Aided Design/Drafting</td>
<td>3</td>
</tr>
<tr>
<td>IT 212</td>
<td>Principles of Graphic Design &amp; Layout</td>
<td>3</td>
</tr>
<tr>
<td>IT 397</td>
<td>Cooperative Education</td>
<td>1-3</td>
</tr>
<tr>
<td>IT 400</td>
<td>Teaching Technology Education</td>
<td>3</td>
</tr>
<tr>
<td>OSH 226</td>
<td>Transportation Safety</td>
<td>2</td>
</tr>
<tr>
<td>OSH 365</td>
<td>Radiation</td>
<td>2</td>
</tr>
<tr>
<td>OSH 375</td>
<td>Asbestos</td>
<td>2</td>
</tr>
<tr>
<td>OSH 385</td>
<td>Instrumentation</td>
<td>2</td>
</tr>
<tr>
<td>OSH 395</td>
<td>Hazardous Materials Management</td>
<td>3</td>
</tr>
<tr>
<td>OSH 440</td>
<td>Industrial Safety</td>
<td>3</td>
</tr>
</tbody>
</table>

### INDUSTRIAL HYGIENE CONCENTRATION (OPTION II)

Required: 27 credits including:

1. The following 17 credits:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 209</td>
<td>Quantitative Analysis</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 240</td>
<td>Survey of Organic Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>OSH 405</td>
<td>Industrial Hygiene</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 410</td>
<td>Drugs Subject to Abuse</td>
<td>2</td>
</tr>
<tr>
<td>OSH 440</td>
<td>Industrial Safety</td>
<td>3</td>
</tr>
</tbody>
</table>

2. 10 credits selected from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 122</td>
<td>Computer Aided Design/Drafting</td>
<td>3</td>
</tr>
<tr>
<td>IT 212</td>
<td>Principles of Graphic Design &amp; Layout</td>
<td>3</td>
</tr>
<tr>
<td>IT 397</td>
<td>Cooperative Education</td>
<td>1-3</td>
</tr>
<tr>
<td>IT 400</td>
<td>Teaching Technology Education</td>
<td>3</td>
</tr>
<tr>
<td>OSH 355</td>
<td>Inspections</td>
<td>1</td>
</tr>
<tr>
<td>OSH 365</td>
<td>Radiation</td>
<td>1</td>
</tr>
<tr>
<td>OSH 375</td>
<td>Asbestos</td>
<td>2</td>
</tr>
<tr>
<td>OSH 385</td>
<td>Instrumentation</td>
<td>2</td>
</tr>
<tr>
<td>OSH 395</td>
<td>Hazardous Materials Management</td>
<td>3</td>
</tr>
<tr>
<td>OSH 440</td>
<td>Industrial Safety</td>
<td>3</td>
</tr>
</tbody>
</table>

### 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 Faculty of Industrial 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 2.00 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.

#### 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/F

#### 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/F

#### 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. SS/F

#### 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

#### 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/F

#### 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. SS/F

#### 385. Instrumentation

2 credits. A study of the rules, regulations, requirements for the sampling analysis and monitoring of the business and industry workplace environments. 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/F

#### 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 measure 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 operations to include the recognition, evaluation, control and disposal of hazardous materials as they relate to industry. Demonstrations, field trips and group activities will be an integral aspect of this course. S/F

#### 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/F

#### 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/F

#### 435. Risk Management

2 credits. The focus of this course will be on the global perspective of loss control measuring efforts in the minimization of financial insurance and workers compensation liabilities. F/F

#### 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 recordkeeping. S/F

### Occupational Therapy (OT)

S. McIntyre (Chair), Bass, Byram, Fox, Stube, and Zimmerman

The Occupational Therapy program is accredited by the Accreditation Council for Occupational Therapy Education. 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 Essentials of an Accredited Educational Program for the Occupational Therapist, 1991. Graduates of the program will be able to sit for the national certification examination for the occupational therapist administered by the
National Board for Certification in Occupational Therapy, Inc. (NBCOT, 500 South Frederick Avenue, Suite 200, Gaithersburg, MD 20877-4150; phone 301-990-7979). After successful completion of this exam, the individual 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 Exam.

The following four and one-half year program will lead to a Bachelor of Science in Occupational Therapy. The student spends the first two years as a pre-major in the College of Medicine and Health Sciences 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 CPEP in Natural Sciences will not meet Biology and Chemistry requirements in Occupational Therapy. Students should carefully check all CPEP exams for potential acceptance at UND. Acceptance is on a competitive basis with consideration given to pre-professional performance in the sciences, general graduation requirements, leadership potential, volunteer work and personal qualifications. A student must have at least a C in each of the Sciences, English Composition, and all Occupational Therapy courses. A student cannot repeat or withdraw from a course more than one time per course to remain eligible for admission to the professional program. A minimum grade point average of 2.7 is required for admission to the professional program, to remain in the professional program and to be eligible for Level II fieldwork placement and graduation. A student must satisfactorily complete all courses each semester to be eligible to enroll for the next semester. The Occupational Therapy Department reserves the right to place on professional probation or cancel the registration of any student in Occupational Therapy whose performance in relation to patient treatment is unsatisfactory.

Program accommodations for qualified handicapped persons will be reviewed upon notification to the department of a prospective student’s needs and limitations.

A satellite professional level occupational therapy program is available for Wyoming residents 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, phone 307-268-2541. Wyoming residents may call 1-888-699-0006.

School of Medicine and Health Sciences

B.S. IN OCCUPATIONAL 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. School of Medicine and Health Sciences (see requirements in the School of Medicine and Health Sciences listing).
III. The Following Curriculum:

The following courses are required to be taken prior to starting the Professional Occupational Therapy Program:

**Pre-Occupational Therapy**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng 110, 120</td>
<td>Communications</td>
<td>(9)</td>
</tr>
<tr>
<td>Chem 115, 115L</td>
<td>Introduction to Chemistry (laboratory)</td>
<td>(4)</td>
</tr>
<tr>
<td>Chem 121, 121L</td>
<td>General Chemistry (laboratory)</td>
<td>(4)</td>
</tr>
<tr>
<td>Math 103 or 104</td>
<td>College Algebra or Finite Mathematics</td>
<td>(3)</td>
</tr>
<tr>
<td>Psych 111</td>
<td>Introduction to Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>Psych 241</td>
<td>Introduction to Statistics or equivalent</td>
<td>(4)</td>
</tr>
<tr>
<td>Psych 250</td>
<td>Developmental Psychology</td>
<td>(4)</td>
</tr>
<tr>
<td>Psych 270</td>
<td>Abnormal Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>Anat 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>(3)</td>
</tr>
<tr>
<td>Soc 110</td>
<td>Introduction to Sociology</td>
<td>(3)</td>
</tr>
<tr>
<td>Phy 301</td>
<td>Mechanics of Human Physiology</td>
<td>(4)</td>
</tr>
<tr>
<td>OT 200</td>
<td>Introduction to Occupational Therapy</td>
<td>(2)</td>
</tr>
<tr>
<td>OT 205</td>
<td>Medical Terminology</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Arts and Humanities Electives</td>
<td>(9)</td>
</tr>
</tbody>
</table>

* 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.

** As a prerequisite for Psych 241, student needs to undertake Math 103 or 104.

| Group A | | |
|---|---|---|---|
| Junior Year | | | |
| First Semester | | | |
| OT 303 | OT with Infants & Pre-School Children | (4) |
| OT 305 | Group Experience | (1) |
| OT 309 | Medical Science | (2) |
| OT 315 | Orientation to Occupational Therapy | (1) |
| OT 322 | Anatomy for Occupational Therapy | (5) |
| Second Semester | | | |
| OT 304 | Psychosocial Aspects of Occupational Therapy with Children, Adolescents, and Young Adults | (4) |
| OT 307 | Occupational Therapy with School Children and Young Adults | (4) |
| OT 308 | Leadership Skills in Occupational Therapy | (1) |
| OT 310 | Medical Science | (3) |
| OT 312 | Muscle Function in Health and Disease | (4) |
| OT 386 | Practicum: Children and Adolescents | (1) |

**Senior Year**

In the Senior Year, students will be divided into two groups. This is due to the nature of the courses and the facilities available (Practicum, Community Placement, and Laboratory).

| Group B | | |
|---|---|---|---|
| First Semester | | | |
| OT 401 | Adaptive Technology for Occupational Therapy | (2) |
| OT 403 | Physical Aspects of OT with the Maturing Adult | (4) |
| OT 415 | Integration of Occupational Therapy Theory | (1) |
| OT 483 | Practicum: Physical Dysfunction | (2) |
| OT 484 | Community and Industrial Aspects of Occupational Therapy | (1) |
| OT 485 | Seminar: Treatment of Physical Dysfunction | (1) |
| OT 493 | Workshop | (1) |

Second Semester

| OT 404 | Psychosocial Aspects of Occupational Therapy with the Maturing Adult | (4) |
| OT 415 | Integration of Occupational Therapy Theory | (1) |
| OT 482 | Practicum: Psychosocial Dysfunction | (2) |
| OT 482S | Seminar: Treatment in Psychosocial Dysfunction | (1) |
| OT 493 | Workshop | (1) |

Upon satisfactory completion of all academic courses, students are required to complete at least 6 months of fieldwork to be eligible for graduation.

**Fieldwork**

| OT 485 | Fieldwork — Psychosocial Dysfunction | (3 months) |
| OT 487 | Fieldwork — Physical Dysfunction | (3 months) |
Courses

200. Introduction to Occupational Therapy. 2 credits. Prerequisites: Anatomy 204, Psychology 251, and Department Major: History, scope, objectives, and functions of Occupational Therapy. F/S

205. Medical Terminology. 1 credit. Knowledge of medical terminology. F/S

303. Occupational Therapy with Infants & Pre-School Children. 4 credits. Prerequisite: Registered in the professional Occupational Therapy program. Normal and abnormal human development, conception through pre-school years. Emphasis on reflexes, sensory systems, sensory integration, illness and trauma, assessment procedures, treatment techniques and therapeutic media. Laboratory included. F

304. Psychosocial Aspects of OT with Children, Adolescents & Young Adults. 4 credits. Prerequisites: Registered in professional Occupational Therapy program, OT 303, 305, 309, 322. Psychosocial dysfunction in children, adolescents, and young adults, with emphasis on OT evaluation, planning, and treatment. Laboratory included. F/S

305. Group Experience. 1 credit. Prerequisite: Registered in professional Occupational Therapy program. Promote verbal and nonverbal communication. Laboratory included. S-U grading only. S

307. Occupational Therapy with School Children & Young Adults. 4 credits. Prerequisites: Registered in professional Occupational Therapy program, OT 303, 305, 309, 322. Human development, school years through young adulthood. Effects of physical, psychosocial, and developmental disabilities. Assessment and treatment procedures. Therapeutic techniques and media. Laboratory included. S

308. Leadership Skills in Occupational Therapy. 1 credit. Prerequisites: Registered in professional Occupational Therapy program, OT 303, 305, 309, 322. Experiential learning in a group setting. This provides OF students with the opportunity to function as facilitators for their role in therapeutic groups in psychiatric settings. Laboratory included. S

309. 310. Medical Sciences I, Medical Sciences II. 2 credits, 3 credits. Prerequisite: Registered in professional Occupational Therapy program. The effect upon the human being of interruptions in, aberrations of, and trauma to the developing human organism throughout the life span. 309: F; 310: S

312. Muscle Function in Health and Disease. 4 credits. Prerequisite: Registered in professional Occupational Therapy program. OT 322. Review of muscle-culature acting on the extremities and trunk. Orientation to patterns of muscle action with neuromuscular involvement. Theory and techniques of muscle testing. Laboratory included. S

315. Orientation to Occupational Therapy Theory. 1 credit. Prerequisite: Registered in Professional Occupational Therapy Program. Corequisites: OT 303, 305, and 309. Orientation to philosophical origins and theoretical framework of theories used in occupational therapy practice. F/S

322. Anatomy for Occupational Therapy. 5 credits. Prerequisite: Registered in professional Occupational Therapy program. Detailed lectures and demonstrations on neuroanatomy and anatomy of the extremities. Laboratory included. F/S

386. Practicum: Children/Adolescents. 1 credit. Prerequisites: Registered in professional OT program. Co-requisites: OT 304, 307, 309, 310. Orientation to patterns of muscle action with neuromuscular involvement. Theory and techniques of muscle testing. Laboratory included. S

387. Cooperative Education in Occupational Therapy. 1-6 credits, repeatable to a total of 12 credits. Prerequisites: OT 200 and 205; overall GPA of at least 2.5; completion of 40 university credits, and approval of the Director of OF Cooperative Education Program. S-U grading only. F/S

401. Adaptive Technology for Occupational Therapy. 2 credits. Prerequisite: Registered in professional Occupational Therapy program, and OT 304, 307, 309, 310, and 322. Co-requisites: OT 403, 483, 485, 484. The study of materials, tools, and equipment related to Occupational Therapy with emphasis on technical communication skills. Laboratory included. F/S

402. Orientation to Research in Occupational Therapy. 2 credits. Prerequisite: Registered in Professional Occupational Therapy program. Lecture and practice in the proper use of research design, source material, elementary statistics, and scientific manuscript preparation. F/S

403. Physical Aspects of OT with the Maturing Adult. 5 credits. Prerequisite: Registered in professional Occupational Therapy program. Physical dysfunction in the maturing adult with the emphasis on Occupational Therapy evaluation, planning, and implementation of treatment. Laboratory included. F/S

404. Psychosocial Aspects of OT with the Maturing Adult. 4 credits. Prerequisite: Registered in professional Occupational Therapy program, OT 304, 305, 309, 322. Psychosocial dysfunction in the maturing adult with emphasis on OT evaluation, planning, and implementation of treatment. Laboratory included. F/S

405. Organization and Administration of Occupational Therapy. 2 credits. Prerequisite: Registered in Professional Occupational Therapy program. F

415. Integration of Occupational Therapy Theory. 1 credit. Prerequisites: Registered in Professional Occupational Therapy program, and OT 303, 304 and 307. Corequisites: OT 403 or 484. Integration of didactic material presented in OT 315: Orientation to Occupational Therapy Theory, all occupational therapy professional theory courses, and level one clinical experiences. S

482. Practicum: Psychosocial. 2 credits. Prerequisites: Registered in professional Occupational Therapy program. Occupational Therapy experience in psychiatric field work facilities in the tri-state region supervised by registered occupational therapists and university faculty. S/U grading only. F/S

482S. Seminar: Practicum Integration I. 1 credit. Prerequisite: Registered in professional Occupational Therapy program. Integration of didactic information with level I clinical practice in the area of psychosocial dysfunction. F/S

483. Practicum: Physical Dysfunction. 2 credits. Prerequisites: Registered in professional Occupational Therapy program. Observation and experience in field work facilities in the tri-state region supervised by registered occupational therapists and university faculty. S/U grading only. F/S

483S. Seminar: Practicum Integration II. 1 credit. Prerequisites: Registered in professional Occupational Therapy program. Integration of didactic information with Level I clinical practice in the area of physical dysfunction. F/S

484. Community and Industrial Aspects of Occupational Therapy. 1 credit. Prerequisites: Registered in professional Occupational Therapy program. Application of Occupational Therapy in industrial and community settings within commuting distance from UND. F/S

485. Fieldwork in Psychosocial Dysfunction. 6 credits. Prerequisites: Registered in professional Occupational Therapy program. Completion of all academic work with a 2.7 GPA. Application of Occupational Therapy in evaluation and treatment in psychosocial dysfunction fieldwork facilities. Three months full time. S/U grading only. F/S

486. Elective Field Work in Occupational Therapy. 2-12 credits, repeatable to 12 credits. Prerequisite: Registered in professional Occupational Therapy program. Completion of all academic work with a 2.7 GPA. Application of OT in evaluation and treatment in optional area of student special interest in selected field work facilities. One-to-three months full time. S-U grading only. F/S

487. Field Work in Physical Dysfunction. 6 credits. Prerequisites: Registered in professional Occupational Therapy program. Completion of all academic work with a 2.7 GPA. Application of occupational therapy in evaluation and treatment in physical dysfunction. Three months full time. S/U grading only. F/S

491. Independent Study in Occupational Therapy. 1-6 credits. Prerequisite: Registered in the professional Occupational Therapy program. Research and/or independent study in a specialized area in Occupational Therapy. Elective for Occupational Therapy majors. F/S/S

492. Community Experience. 1-4 credits, repeatable to 12 credits. Prerequisite: Departmental approval. Opportunity for students to engage in professional learning activities related to Occupational Therapy in the community. Three months full time. S/U grading only. F/S

493. Workshop. 1-6 credits, repeatable to 6 credits. Prerequisite: Departmental approval. A workshop course with topics dictated by faculty and student interests primarily for but not confined to continuing education. S/U grading only. On Demand.

Peace Studies (PS)

The Peace Studies courses listed below may be taken either as elective courses or as part of a program in Interdisciplinary Studies (IDS). For information on the major in Interdisciplinary Studies, see Interdisciplinary Studies listing and consult the College of Arts and Sciences Office.

The Peace Studies courses are taught by faculty from the departments and colleges of law, 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.

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. S

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/S

IDS 280. Learning Across Disciplines. 3 credits. 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.
Pharmacology, Physiology and Therapeutics

Borg, Brown-Borg, Claren, Combs, Doze, Ebadi, Haselton, McCleary, Murphy, Porter, Ren, and Vari

The Department of Pharmacology, Physiology and Therapeutics' undergraduate mission is to provide students majoring in Allied Health and Science programs with a basic foundation of pharmacology and physiology. The emphasis is on relevance and application to their career path. Further, we foster and encourage undergraduate participation in ongoing faculty research through the independent study option described below. Educational objectives for individual pharmacology courses include an appreciation of the biological consequences of prescribed drugs, over-the-counter drugs, and illegal drugs. Educational objectives for physiology courses include an exploration of general physiology from a molecular level to a whole organ level, emphasizing the integration of homeostatic mechanisms.

Individual courses in pharmacology and physiology are required for various Allied Health and Science programs. A pharmacology course emphasizing the pharmacological relevance of substance abuse is required for the Chemical Use/Abuse Awareness minor in Social Work. Students in these courses will appreciate the increased relevance of pharmacology and physiology in their disciplines, providing them with an enhanced opportunity to further their education in the health sciences at the graduate and professional level.

Independent Study

Qualified students are encouraged to participate in independent studies, honors work or undergraduate research in departmental laboratories. Students undertaking the independent study option are required to identify a research emphasis and complete their studies in research laboratories of participating faculty members in the department.

Courses

Phrm 315. Introduction to Pharmacology. (CCN: 215) 3 credits. Prerequisites: Phy 301 and Chem 107 or equivalent. A survey of the more important drugs used in medicine, including basic principles, clinical uses and possible adverse effects. S

PhTx 410. Drugs Subject to Abuse. 2 credits. Prerequisite: advanced undergraduate standing. Biochemical, pharmacological, behavioral and therapeutic aspects of substance abuse. S

PhTx. 492. Research in Pharmacology and Toxicology. (CCN) 1-4 credits, repeatable to 4 credits. Prerequisite: advanced undergraduate standing and consent of instructor. Laboratory research under faculty supervision. F,S, SS

PhTx. 499. Readings in Pharmacology and Toxicology. (CCN) 1-4 credits. Prerequisites: advanced undergraduate standing and consent of instructor. Topics and credits to be arranged with the instructor. F,S, SS

Phy 294. ST: Biomed Research in Physiology. 1-4 credits, repeatable to 4 credits. Prerequisites: advanced undergraduate standing and consent of instructor. Laboratory research under faculty supervision. F,S, SS

Phy 301. Mechanics of Human Physiology. 4 credits. Prerequisites: introductory courses in two of the following subjects: anatomy, chemistry, or biology. A study of the normal function of the human body with particular consideration given to the necessary background pedigreed 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, SS

Philosophy and Religion

(Phil and Rels)

L. Lindholm, Baldwin, Lowe, Miller, Poochigian, and Weinstein

The two disciplines of Philosophy and Religion represent human-kind’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 course work 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. Juniors and seniors are urged to register for courses at the 300-400 level even though they have not taken courses at the 100-200 level.

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

Phil 300 Classical Greek and Hellenistic Philosophy ..................(3)
Phil 301 Medieval Philosophy ..........................(3)
Phil 302 Renaissance and Enlightenment ..................(3)
Phil 303 Kant and the Nineteenth Century ..............(3)

A minimum of 18 hours of upper level work in Philosophy.

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 345 The Ancient Near East ..........................(3)
IS 352 Native American Philosophy ....................(3)
Phil 283 Oriental Philosophy .............................(3)
Rel 203 World Religions .................................(3)
RELIGION CONCENTRATION
B.A. WITH MAJOR IN PHILOSOPHY AND RELIGION:

REQUIRED 20 CREDITS INCLUDING:

- Phil 283: Oriental Philosophy (3)
- Phil 300: Classical Greek and Hellenistic Philosophy (3)
- Phil 301: Medieval Philosophy (3)
- Phil 302: Renaissance and Enlightenment (3)
- Phil 303: Philosophy Since the Enlightenment (3)

The additional 15 hours should normally include work complementary to the student’s major or to some developed personal interest. Students may consult departmental advisers to develop a special concentration in the minor with an emphasis on philosophy of science, ethics in the professions, aesthetics in art and literature, etc.

B.A. WITH MAJOR IN PHILOSOPHY AND RELIGION:
PHILOSOPHY CONCENTRATION

REQUIRED 21 CREDITS IN PHILOSOPHY:

- Phil 283: Oriental Philosophy (3)
- Phil 300: Classical Greek and Hellenistic Philosophy (3)
- Phil 215: Contemporary Moral Issues (3)
- Phil 220: Introduction to Logic (3)
- Phil 283: Oriental Philosophy (3)

Required 20 credits in Philosophy:

- 6 hours from:
  - Phil 283: Oriental Philosophy
  - Phil 300: Classical Greek and Hellenistic Philosophy
  - Phil 301: Medieval Philosophy
  - Phil 302: Renaissance and Enlightenment
  - Phil 303: Philosophy Since the Enlightenment

The additional 15 hours should normally include work complementary to the student’s major or to some developed personal interest. Students may consult departmental advisers to develop a special concentration in the minor with an emphasis on philosophy of science, ethics in the professions, aesthetics in art and literature, etc.

MINOR IN PHILOSOPHY AND RELIGION:
PHILOSOPHY CONCENTRATION

Required 21 credits in Philosophy:

- 6 hours from:
  - Phil 283: Oriental Philosophy
  - Phil 300: Classical Greek and Hellenistic Philosophy
  - Phil 301: Medieval Philosophy
  - Phil 302: Renaissance and Enlightenment
  - Phil 303: Philosophy Since the Enlightenment

The additional 15 hours should normally include work complementary to the student’s major or to some developed personal interest. Students may consult departmental advisers to develop a special concentration in the minor with an emphasis on philosophy of science, ethics in the professions, aesthetics in art and literature, etc.

MINOR IN PHILOSOPHY AND RELIGION:
RELIGION CONCENTRATION

Required 20 credits including:

- Rels 220: Old Testament (3)
- Rels 203: World Religions (3)
- T&L 433: Multicultural Education (3)

Some of these courses simultaneously fulfill other Philosophy/Religion requirements.

Level IV proficiency in a foreign language (i.e., 4 semesters) is strongly recommended.

MINOR IN PHILOSOPHY AND RELIGION:
RELIGION CONCENTRATION

Required 20 credits including:

- Rels 220: Old Testament
- Rels 203: World Religions
- Religion Electives (8 hours must be at 300-400 level) (14)

Courses in Philosophy

Since a major in philosophy involves a rigorous study of basic questions about human life and action, knowledge, truth, and values, it is recognized as providing a sound base for those who plan to continue their education in one of the professional specialties such as law, medicine, or the ministry. More recently, liberal arts degrees in fields which “make you think” have become increasingly valued in business and government. Majoring in philosophy also prepares a student for graduate work in any of the humanities (most notably philosophy); in most cases the graduate will pursue a doctoral degree to teach at the college level.

Students majoring in other fields who find themselves seriously interested in the theoretical aspects of their disciplines — e.g. ethical implications of practice, the functions of knowledge in the field, the legitimacy of methods — may want to consider a special concentration, minor, or second major in philosophy to explore that interest. The emphasis of such studies could be philosophy of science and technology, ethics in the professions (engineering, medicine), or aesthetics in literature or fine arts, to name a few examples.

101. Introduction to Philosophy (CCN) 3 credits. An introductory survey of the discipline of philosophy. Students will join the thoughtful search, in which philosophers have engaged through reading and discussion since ancient days, into the problems of reality (metaphysics), of truth and meaning (logic and philosophy of language), of moral standards (ethics), of knowledge (epistemology), of beauty (aesthetics), and other fundamental questions. F-S

215. Contemporary Moral Issues (CCN) 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-S

220. Introduction to Logic (CCN) 3 credits. A theoretical and practical introduction to the principles of reasoning — formal and informal, deductive and inductive. Students will study language and patterns of reasoning as vehicles for and obstacles to critical thinking. The central characteristics of deduction and validity; the role of hypotheses, inductive reasoning, probability, statistical inference, scientific investigations and other models of critical thinking and their limits will be covered. F-S

283. Oriental Philosophy (CCN: 588) 3 credits. The main philosophical systems of India, China and Japan will be examined. F/S

300. Classical Greek and Hellenistic Philosophy 3 credits. The ancient Greeks and Romans laid the foundations for even the most contemporary philosophy, and their ideas 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 persistence. F/S

301. Medieval Philosophy 3 credits. Philosophy in Western Europe from the end of the Roman Empire to the early 15th Century as reflected in the writings of such thinkers as Boethius, Augustine, Abelard, Aquinas and Ockham. S/S

302. Renaissance and Enlightenment 3 credits. Philosophy from the time of Petrarch (c. 1350) to that of the American Revolution as seen in the writings of such philosophers as Bruno, Bacon, Descartes, Spinoza and Hume. This is the period that sees the origins of modern thought. The implications of the work of the philosophers had an important role in shaping contemporary society, including the arts, literature, science, politics, and economics. F/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/S

304. Twentieth Century Philosophy 3 credits. Contemporary developments in Philosophy since the beginning of the 20th century. S/S

309. American Philosophy 3 credits. A survey of major figures and movements in American philosophy. F/S

310. Ethics (CCN: 210) 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 examples will appear in discussions, the central focus of the course will be historical and theoretical. F/S

320. Metaphysics: What is Reality? 3 credits. A study of the basic categories by which things are understood. Topics include such issues as appearance and reality, substance, particular and general, space and time, and personal identity. F/S

330. Epistemology: What Can We Know and How Can We Know it? 3 credits. Inquiry into the nature and limits of knowledge as distinguished from belief; types of knowledge; the role of reason and sense experience in empirical knowledge. S/S

335. 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 welcome in this course. S/S

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

372. Ethics in Health Care 3 credits. Some ethical problems and ethical guidelines are of particular concern to citizens and to professionals interested in health care fields. Examples are informed consent, abortion, euthanasia, organ transplant policies, professional standards versus patient rights, assisted suicide, ethics of testing/screening, health care policy and reform. Class members will explore such issues through case studies in a context of relevant ethical history and theory. Junior/senior standing encouraged. No prerequisites. S/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
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 post-graduate studies in law, medicine, and the ministry.

101. Introduction to Religion (West). (CCN) 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). (CCN) 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

116. Women and Religion. (CCN) 3 credits. An examination of the role women have played in religious thought throughout history: as goddesses and mythic figures, as religious leaders, and as spiritual guides. S


203. World Religions. (CCN) 3 credits. A general survey of major world religions including Hinduism, Buddhism, Confucianism, Taoism, Islam, Judaism and Christianity. Stress on the major tenets of these religions. S

220. Old Testament. (CCN) 3 credits. A study of Israel’s awareness of itself as a faith-community from the Exodus to the post-exilic period; investigation of the problems of multiple authorship, literary forms and archaeological evidence. F

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/S

250. East and West in Religion. 3 credits. A critical and comparative study of people’s religious orientation between Eastern and Western traditions. F

300. Jesus in Gospel and History. 3 credits. A study of one of the most significant personalities in religious history. Biblical and non-biblical texts which have defined and described Jesus will be examined. F

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 presence of 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; 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/3

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/S

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. (CCN) 3 credits. A historical and critical survey of different Buddhist schools in India, China, Tibet, and Japan. S/3

399. Selected Topics. (CCN) 1-3 credits. A selected topic in the area of religious studies such as Atheism, Religion and Public Life, Lessons of the Holocaust, Religion and the Environment, Greco-Roman Religion, African American Religious History, Women Religious Writers. 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/3

423. Psychology of Religion. 3 credits. The psychological significance of various types of religious experience, personal and social. An examination of classical psychological statements about religion including James, Allport, Kierkegaard, Freud, and Jung. S/2

491. Seminar on Religion. (CCN) 3 credits. Prerequisites: Junior or Senior standing and some upper level work in Religion or consent of the instructor. A consideration of selected philosophical problems or classic texts of mutual interest to departmental faculty and more advanced students. Previous work in religion or related disciplines is recommended. On Demand.

494. Independent Study in Philosophy. (CCN) 1-3 credits. May be repeated to 8 credits. Prerequisites: consent of instructor. Supervised tutorial on an individual basis. Typically, a student will work independently to a considerable extent. In other cases, the course may take the form of regularly scheduled meetings. F/S

Physical Education and Exercise Science (PEXS)

R. Brinkert (Chair), Short, Steen, Stiles, Von Duvillard, Watson, and Whitehead

The Department of Physical Education and Exercise Science believes that individuals and society benefit from physical activity. Thus 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 level; (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 and fitness education and management, and athletic coaching, or to continue their education in graduate studies.

Basic Instruction Courses — the Department of PEXS also provides basic instruction for all students of the University in a wide variety of sport, aquatics, dance, and fitness classes. Activity courses in physical education may count toward the hours required for graduation. These credit hours may be earned by enrolling in PEXS 101, 102 or 103. In some cases, equipment is provided by the department; however, there are fees assessed for certain specified activities.

College of Education and Human Development

I. UNDERGRADUATE PHYSICAL EDUCATION PROGRAM:
The physical education program provides a major with a teacher education option or a major with a related area option.

A. Major in Physical Education — consists of a core of courses and a teacher education option or the same core of courses with a related area option which allows a student to study physical education and a related subdiscipline. The teacher education option is designed for those students who wish to teach physical education in grades K-12. The related area option is for those students who wish to find employment in the commercial fitness field.

B. Minor in Athletic Coaching — offered to students who wish to prepare for athletic coaching.

C. Minor in Health Education — preparation for school health teaching.

B.S. IN PHYSICAL 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. The College of Education and Human Development Requirements (see college listing).

III. Prerequisite courses, 19 hours including: (Some credits may be used to satisfy the General Education Requirements*).

Chem 115 & 115L Introductory Chemistry and Laboratory* (4)
Psyc 111 Introduction to Psychology* (3)
Soc 110 Introduction to Sociology* (3)
Anat 204, 204L Anatomy for Paramedical Personnel and Laboratory (5)
Phy 301 Mechanics of Human Physiology (4)

IV. Required curriculum, 32 hours including:
PEXS 107 Introduction to Physical Education (3)
PEXS 223 Movement Performance and Analysis (12)
PEXS 276 Motor Learning (3)
PEXS 332 Biomechanics (4)
PEXS 401 Sport Sociology (3)
PEXS 402 Exercise Physiology (4)
PEXS 440 Sport Psychology (3)

V. One of the following options:

A. Teacher Education/Certification Option

Students seeking certification to teach physical education in grades K-12 must complete the requirements for the B.S. in Physical Education and the Secondary Education requirements in the Department of Teaching and Learning. See the Department of Teaching and Learning section.

Admission to Teacher Education is required. Students normally seek admission to Teacher Education in their sophomore year while enrolled in T&L 200. See the Department of Teaching and Learning section.

Required 22 hours, including:
PEXS 205 Physical Education for the Elementary Grades (3)
PEXS 310 First Aid and CPR (2)
PEXS 323 Intro to Teaching in Phys. Ed. and Sport Settings (3)
PEXS 323L Lab — Introduction to Teaching (1)
PEXS 355 Motor Development. (3)
PEXS 400 Methods and Mat. for Teaching Secondary Phys Ed. (included in Secondary Education Certification Sequence, T&L) (3)
PEXS 400L Lab — Methods and Materials (1)
PEXS 403 School Health Education. (2)
PEXS 404 Adapted Physical Education (2)

PEXS 406 Strategies for Teaching Phy Ed. in the Elem. School (3)
PEXS 406L Lab — Strategies for Teaching Elementary School. (1)
PEXS 487 Senior Teaching Seminar. (1)

Required in the Department of Teaching and Learning 30 hours consisting of 14 hours of Secondary Education Certification Preparation Sequence and 16 hours of student teaching. See the Department of Teaching and Learning section.

B. Related Area Option

1. Students will complete a major and/or minor in a subject area related to physical education.

2. The remaining credit hours to satisfy the University minimum Graduation Requirements of 125 credits will be chosen from elective courses with the consent of the adviser.

MINOR IN ATHLETIC COACHING

Required 27 credits, including:

PEXS 109 Introduction to Coaching (1)
PEXS 207, 207L Prevention & Care of Injuries (3)
PEXS 223 Movement Performance and Analysis (3)
PEXS 323 Intro to Teaching in Phys. Ed. and Sport Settings (3)
PEXS 324 Sport Physiology (3)
PEXS 325 Youth and Children in Sport (3)
PEXS 341 Organization & Administration of Athletics (2)
PEXS 423 Coaching Methods (2 hours each to coincide with sport specific HPER 223s) (6)
PEXS 486 Practicum in Coaching (2)

Students interested in a Minor in Athletic Coaching should consult with an adviser in Physical Education before beginning the Minor. This is necessary to ensure that courses are appropriately tracked toward the practicum.

MINOR IN HEALTH EDUCATION

Required 14 hours, including:

PEXS 310 First Aid and CPR (2)
PEXS 327 Fitness for Life (3)
PEXS 403 School Health Education (3)
Psy 250 Developmental Psychology (4)
Nutr 240 Fundamentals of Nutrition (3)

and 7-10 hours to include one course from each of the following 3 groups:

Biol 124 Environmental Science (2)
Biol 103 Introduction to Environmental Issues (3)
Biol 250 Human Sexuality (3)
T&L 252 Child Development (3)
Soc 255 The Family (3)
PhyTs 410 Drugs Subject to Abuse (2)
Soc 355 Drugs and Society (3)
Swk 410 Drugs: Addiction Dynamics (2)

Special topics and other courses may be substituted only with Physical Education adviser approval.

Students interested in a Minor in Health Education should consult with an adviser in Physical Education before beginning the Minor.

B.S.ED. WITH A COMBINED MAJOR IN ELEMENTARY AND PHYSICAL EDUCATION

For curriculum outline see the Department of Teaching and Learning section.

Physical Education Courses

101. Physical Education, 1 credit. Instruction in aquatics, dance, fitness, individual sports, team sports, and outdoor pursuits at the introductory level. F,S,SS

102. Physical Education, 1 credit. Prerequisite: PEXS 101 in the same activity or consent of the instructor. Instruction in aquatics, dance, fitness, individual sports, team sports, and outdoor pursuits at the intermediate level. F,S

103. Physical Education, 1 credit. Prerequisite: PEXS 102 in the same activity or consent of the instructor. Instruction in aquatics, dance, fitness, individual sports, team sports, and outdoor pursuits at the advanced level. F,S

107. Introduction to Physical Education. 3 credits. The nature and scope of physical education by means of a critical examination of sport, play, exercise, and dance. Includes laboratory. F,S

109. 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. On Demand.

110. Sports Officiating, 1 credit. Knowledge of the rules and techniques for officiating various sports. Offered by sport; credit is repeatable by sport. On Demand.

University of North Dakota
L a b o r a t o r y. 1 credit. Prerequisites: PEXS 107 & 223. Corequisite: PEXS 323. Superc-practices for the care of persons who have been injured or suddenly become ill. F,S

dren and youth in sport. On Demand.

temporary programs in elementary physical education. Emphasis on appropriate move-

time with special emphasis on those movements related to sport and physical

activity. F

structure of elementary physical education. On Demand.

323. Introduction to Teaching in Physical Education and Sport Settings. 3 credits. Prerequisite: PEXS 107 & 223. Corequisite: PEXS 323. Super-

visored experiences in laboratory and field settings for the purpose of developing teaching skills for physical education and sport settings. On Demand.

323L. Introduction to Teaching in Physical Education and Sport Settings Laboratory. 1 credit. Prerequisites: PEXS 107 & 223. Corequisite: PEXS 323. Super-

visored experiences in laboratory and field settings for the purpose of developing teaching skills for physical education and sport settings. On Demand.

327. Fitness for Life. 3 credits. A classroom course focusing on advanced con-

cepts of lifetime fitness and wellness from a consumer perspective. Emphasis is on the development of personal programs for fitness and wellness. On Demand.

332. Biomechanics. 4 credits. Prerequisite: Anat 204, 204L. The study of human

performance, performance analysis and knowledge as they apply to aquatics, dance, fit-

ness, individual sports, team sports, and outdoor pursuits. Professional preparation courses for HPER majors. F,S

326. Motor Learning. 3 credits. Co-requisite: PEXS 276L. Consideration of vari-

ous factors which may affect learning and performance in human movement activities. S

309. Water Safety Instruction. 2 credits. Prerequisite: Current Senior Lifesaving Certificate. Scientific movement principles, theories and techniques as they apply to the teaching and conduct of aquatic activities. Laboratory teaching assignments. S

310. First Aid and CPR. 2 credits. Recommended Advanced First Aid and CPR prac-

tical experience for persons who have been injured or suddenly become ill. F,S

322. Introduction to Teaching in Physical Education and Sport Settings, 3 credits. Prerequisite: PEXS 107 & 223. Corequisite: PEXS 323. Super-

visored experiences in laboratory and field settings for the purpose of developing teaching skills for physical education and sport settings. F,S

323. Strategies for Teaching Physical Education in the Elementary School. 3 credits. Prerequisites: PEXS 406 and admission to Teacher Education. Corequisite: PEXS 406L. Supervised experiences in the secondary school for the purpose of developing teaching skills for physical education and sport settings. On Demand.

301. Sport Sociology. 3 credits. Prerequisite: Soc 110. The critical exploration of

the purpose of developing teaching skills for physical education and sport settings. F,S

300. Field Experience in PEXS. 1-8 credits. Prerequisite: Consent of instructor and upper division status. Placement of student in a practical setting under university fac-

ulty supervision. F,S

485. Internship. 4-12 credits. Prerequisite: Physical Education majors only. Development of professional skills by working directly with established fitness/wellness, health and human service organizations under the supervision of professionals and facul-

ty. S-U grading only. F,S,SS

486. Practicum in Coaching. 2 credits. Prerequisites: PEXS 423 in the assigned sport or sport in which the student will coach. Supervised experiences in a school setting for the purpose of developing skills and techniques for coaching. F,S

487. Senior Teaching Seminar. 1 credit. Corequisite: T&L 487. A critical analysis

of problems, professional obligations and careers in teaching physical education. F,S

1-4 credits repeatable to 9. Specialized topics related to professional and education settings. Includes lectures, site visits, and fieldwork hours. F,S

397. Cooperative Education in PEXS. 1-4 credits, repeatable to 16. Prerequisite: PEXS 107 or 223. 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

2 credits. Prerequisites: PEXS 222 and 321. Independent and group study of professional placement and leadership in recreation and leisure settings. Practical experiences in recreation settings within the community. Includes lectures, site visits, and fieldwork hours. F,S

400. Methods and Materials for Teaching Physical Education in the Secondary School—Laboratory. 1 credit. Prerequisites: PEXS 406L. Supervised experiences in the secondary school for the purpose of developing teaching skills for physical education and sport set-

tings. On Demand.

401. Sport Sociology. 3 credits. Prerequisite: Soc 110. The critical exploration of

the function of sports in American culture, in an interdisciplinary fashion, with a focus on the contemporary scene. F

402. Exercise Physiology. 4 credits. Prerequisite: Phy 301. The acute and chronic effect of the type, intensity and duration of exercise on physiological function. S

403. School Health Education. 2 credits. Provides prospective health educators with a cursory look at health curriculum construction and investigation of different meth-

ods, devices and classroom techniques. S

404. Adapted Activities Program. 2 credits. Etiology of specific handicaps and adaptations of various activities which the individual may participate in at various grade levels. Theory and practical work will be emphasized. S

406. Strategies for Teaching Physical Education in the Elementary School. 3 credits. Prerequisites: 205, 323, and admission to Teacher Education. Corequisite: PEXS 404L. 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: PEXS 323L & 205, and admission to Teacher Education. Corequisite: PEXS 406. Supervised experiences in the elementary school for the purpose of developing teaching skills for physical education and sport settings. On Demand.

423. Coaching Methods. 2 credits. Prerequisite: PEXS 223 in same sport. Repeatable with different sports to a maximum of 10 credits. Methods employed in coaching specific sports. F,S

440. Sport Psychology. 3 credits. Prerequisite: Psyc 111. Examination of psycho-

logical constructs influencing the competitive sport process and physical activity. S

455. Special Topics in PEXS. 1-4 credits repeatable to 9. Specialized topics related to physical education, health and recreation. On Demand.

480. Field Experience in PEXS. 1-8 credits. Prerequisite: Consent of instructor and upper division status. Placement of student in a practical setting under university fac-

ulty supervision. F,S

485. Internship. 4-12 credits. Prerequisite: Physical Education majors only. Development of professional skills by working directly with established fitness/wellness, health and human service organizations under the supervision of professionals and facul-

ty. S-U grading only. F,S,SS

Physical Therapy

The Department of Physical Therapy offers the entry level Master of Physical Therapy (M.P.T.). The professional educational component of the M.P.T. requires three academic years and one summer session beyond the pre-physical therapy preparation. The physical therapy pro-

fession is considering changes in entry-level education including expan-

sion of the requirements for an entry-level degree. Students interested in the physical therapy program at UND should keep in contact with UND-

PT to keep informed of any changes in the professional and educa-

tional curriculum. Our website is www physicatuniversity of medicine.nodak.edu/pt.

Physical Therapy is an allied health profession open to both men and women. Physical therapists are involved in the evaluation and treatment of many types of disabilities. They are employed by hospitals, rehabili-

nation centers, nursing homes, school systems, community health agen-

cies, and in private practice.

The pre-Physical Therapy curriculum takes two to three years to complete depending on course load. The professional educational com-

ponent of the M.P.T. will require three academic years and one summer session following completion of the pre-physical therapy entrance requirements. The Department advises students to consider elective courses in the areas of psychology, management, principles of education or special education, or the specific Rehabilitation Services Con-

centration in the Department of Social Work. Before a student can make application to the professional program, ALL the coursework listed for the pre-Physical Therapy portion must be completed or underway. Specifically, Physiology 301 and Anatomy 204 must be completed prior to selection. Once that coursework is near completion, the student must make application for the professional program through the Department of Physical Therapy. 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. North Dakota residents are encouraged to spend at least one year in pre-P.T. at UND. Applications must be made to the Department no later than March 1 of the year the student wishes to enter the professional program.

Acceptance into Physical Therapy is on a competitive basis, with the major determinant being the basic science grade point average. The basic science grade point average is defined as: biology (8 semester hours), chemistry (8 semester hours), anatomy (3 semester hours), physics (8 semester hours), psychology (7 semester hours — including Intro and Developmental), and physiology (4 semester hours). Reference letters, a personal interview, and other personal qualifications are also considered prior to final acceptance into the professional program. Acceptance by the Office of Admissions of the University of North Dakota does not consti-

tute acceptance into the professional program in Physical Therapy.

See Physical Therapy in the Graduate Section.
College of Arts and Sciences

B.S. WITH MAJOR IN PHYSICS

I. General Education Requirements (see University GER listing).

II. The Following Curriculum:

36 credits, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 251, 252, 253</td>
<td>University Physics I, II and III and Laboratories.</td>
<td>(12)</td>
</tr>
<tr>
<td>Phys 303</td>
<td>Applied Physics Laboratory.</td>
<td>(2)</td>
</tr>
<tr>
<td>Phys 317</td>
<td>Mechanics.</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 318</td>
<td>Mechanics.</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 324</td>
<td>Thermal Physics.</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 325</td>
<td>Optics.</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 325L</td>
<td>Optics Laboratory.</td>
<td>(1)</td>
</tr>
<tr>
<td>Phys 327</td>
<td>Electricity and Magnetism.</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 328</td>
<td>Electricity and Magnetism.</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 401</td>
<td>Instrument Design.</td>
<td>(3)</td>
</tr>
<tr>
<td>Phys 428</td>
<td>Modern Physics Laboratory.</td>
<td>(2)</td>
</tr>
<tr>
<td>Math 266</td>
<td>Differential Equations.</td>
<td>(3)</td>
</tr>
<tr>
<td>Math 352, 353</td>
<td>Advanced Engineering Math.</td>
<td>(6)</td>
</tr>
</tbody>
</table>

MINOR IN PHYSICS

Required 20 credits in Physics. The specific courses should be in consultation with the department.

Courses

110/110L. Introductory Astronomy. (CCN) 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.

130/130L. Natural Science—Physics. (CCN) 4 credits. For non-science majors, this is a hands-on, inquiry-based course on the workings of science. Emphasis is on critical thinking and the use of the scientific method. Topics will include: electricity, force, motion, and energy. The laboratory is a corequisite of this course. F/S.

140. Physics for Poets. (CCN) 3 credits. An introduction to the fundamental concepts of physics, especially those developed in the twentieth century. A knowledge of elementary algebra is recommended for students with a limited mathematical background. No laboratory. On Demand.


150L. Physics for Aerospace Sciences Laboratory. 1 credit. Corequisite: Phys 150L.

161/161L, 162/162L. Introductory College Physics I & II. (CCN) 8 credits. An introduction to the principles and concepts of physics with applications of mathematical and physical concepts. Sufficient to show the logical progression from one topic to the next. General physics for those who do not plan to take advanced courses 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 prerequisite but knowledge of elementary algebra is recommended.

211/211L, 212/212L. College Physics I & II. (CCN) 8 credits. Prerequisites: For Phys 211. Math 103. For Phys 212. Math 211. The non-calculus general physics course sequence recommended for pre-medical or pre-professional students. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, vibrations and waves, electricity and magnetism, light and optics, and an introduction to modern physics. The laboratory is a corequisite of each course. A student may receive credit for only the one beginning level physics sequence. F/S.

251/251L, 252/252L, 253/253L. University Physics I, II and III. (CCN) 12 credits. Prerequisites: For Phys 251, 151L, Calculus I. For Phys 252, 252L, Calculus II and Physics 251, 251L; For Phys 253, 253L, Calculus III and Physics 252, 252L. The general physics course sequence for students majoring in a science, or engineering. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, heat and thermodynamics, vibrations and waves, electricity and magnetism, light and optics, and an introduction to modern physics. The laboratory is a corequisite of each course. An student may receive credit for only one beginning level physics sequence.

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. 3 credits. Prerequisites: Phys 252 or approval of department. Motion of a single particle, central forces and simple oscillatory systems. F/S.

318. Mechanics. 3 credits. Prerequisites: Physics 317 or approval of department. A continuation of Physics 317. Rigid body motion, wave propagation, general coordinates, and fluid dynamics. S/S.

320. Elementary Solid State Physics. 3 credits. Prerequisites: Phys 253 or approval of department. An introduction to solid state physics with emphasis on applications. F/S.

321. Thermal Physics. 3 credits. Prerequisites: Phys 253 or approval of department. Thermodynamics with an introduction to statistical physics. S/S.

325. Optics. 3 credits. Prerequisites: Phys 253 or approval of department. Geometrical and physical optics with an emphasis on physical optics. S/S.

325L. Optics Laboratory. 1 credit. Corequisite: Phys 325L. Laboratory to accompany Physics 325S.

327. Electricity and Magnetism. 3 credits. Prerequisites: Phys 252 or approval of department. A quantitative treatment of electro-magnetic theory with an introduction to Maxwell's equations. F/S.


328L. Modern Physics Laboratory. 2 credits. Prerequisites: Phys 253 or approval of department. A repetition of the experiments which led to the current state of physics. F/S.

341. Introductory Quantum Physics. 3 credits. Prerequisites: Phys 253 or approval of department. An introduction to quantum mechanics with applications to atomic structure. S/S.

343. Nuclear Physics. 3 credits. Prerequisite: Phys 253 or approval of department. An introduction to the theory of the atomic nucleus. On Demand.

437. Introduction to Solid State Physics. 3 credits. Prerequisite: approval of department. A general introduction to solid state phenomena.
Political Science (Pols)

M. Kweit (Chair), Jendrysik, Jensen, R. Kweit, Light, and Sum

The Faculty 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 Faculty 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 Sciences

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:

A. 37 major hours, including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pols 115</td>
<td>American Government I</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 116</td>
<td>State and Local Government</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 220</td>
<td>International Politics</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 320</td>
<td>Foreign Policies</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 225</td>
<td>Comparative Politics</td>
<td></td>
</tr>
<tr>
<td>Pols 323</td>
<td>Issues in Comparative Politics</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 250</td>
<td>Politics of Public Administration</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 300</td>
<td>Introduction to Research Methods</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 311</td>
<td>Political Thought I</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 312</td>
<td>Political Thought II</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 405</td>
<td>Political Behavior</td>
<td></td>
</tr>
<tr>
<td>Pols 432</td>
<td>Public Policy Making Process</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 495</td>
<td>Senior Colloquium</td>
<td>(1)</td>
</tr>
</tbody>
</table>

B. Select 6 hours from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pols 220</td>
<td>International Politics</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 225</td>
<td>Comparative Politics</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 250</td>
<td>Politics of Public Administration</td>
<td>(3)</td>
</tr>
</tbody>
</table>

C. Select 6 credits from:

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pols 300</td>
<td>Research Methods</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 311</td>
<td>Political Theory</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 312</td>
<td>Political Theory</td>
<td>(3)</td>
</tr>
<tr>
<td>Pols 405</td>
<td>Political Behavior</td>
<td>(3)</td>
</tr>
</tbody>
</table>

D. 6 additional credits of electives from 300 level and above courses in Political Science which may include the courses listed.

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. Prerequisite: A statistics course prior to enrollment. 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. Analyzes U.S. Supreme Court decisions and interpretations which focus on civil liberties; equality protections, due process, First Amendment rights. F

308. Intergovernmental Relations. 3 credits. Analyzes the growing inter-relationship of federal, state and local governments with emphasis on federal financial assistance. 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

311. Development of Political Thought I. 3 credits. Classical political thought to the seventeenth century with emphasis on the thought of Plato, Aristotle, Cicero, St. Augustine, St. Thomas Aquinas, and Machiavelli. F

312. Development of Political Thought II. 3 credits. Political thought from the seventeenth century to the present with emphasis on the thought of Hobbes, Locke, Rousseau, Hume, Burke, Hegel, and Marx. S

318. American Political Thought. 3 credits. A historical analysis of the major thinkers and of the streams of thought which molded the political philosophy and institutions of the United States. The focus is on the Parliaments to the present. F

320. Forensic Politics. 3 credits. Examination of the roles of major powers in the international system, with emphasis on the foreign policies of the United States and other major powers. S

321. 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

393. Problems in Political Science. 1-3 credits. Maximum 6 credits. Students study special topics under the direction and supervision of a member of the staff; prior consent of instructor required before enrollment. F/S

397. Cooperative Education. 1-6 credits. Repeatable to 12 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. Once per year. F/2, S/2

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. F, 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. 2.6 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. 1-6 credits. 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 administrative issues. This course is designed for Public Administration majors only. S

495. Senior Colloquium. 1 credit. Prerequisite: Senior standing. Corequisite: Pols 432. 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. Corequisite: Pols 432 and Pols 495. A course which requires mentoring introductory students in Political Science. Further, students will undertake supervised independent research culminating in a major paper. This course is designed for majors only. S

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Psychology (Psyc)

M. Grabe (Chair), Antes, Ferraro, Holm, King, McDonald, Peters, Petros, Terrance, Tyler, Vogeltanz-Holm, Weatherly, and Wenzel

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 241 .................Introduction to Statistics .....................(4)
Psyc 303 .................Research Methods in Psychology ..........(4)
Psyc 405 .................History and Systems of Psychology .........(3)
**Psyc 496 .................Senior Seminar ..............................(1)

One course from Area A:

Psyc 433 .................Psychology of Learning .....................(3)
Psyc 434 .................Motivation and Emotion .....................(3)
Psyc 435 .................Physiological Psychology ....................(3)
Psyc 436 .................Perception ........................................(4)
Psyc 437 .................Psychophysiology ............................(3)
Psyc 439 .................Cognitive Psychology ........................(3)

One course from Area B:

Psyc 421 .................Individual and Group Differences ..........(3)
Psyc 451 .................Advanced Developmental Psychology .......(3)
Psyc 460 .................Advanced Social Psychology ................(3)
Psyc 465 .................Multicultural Psychology ................... (3)
Psyc 470 .................Introduction to Clinical Psychology ...........(3)

*Psyc 111 is prerequisite to all other psychology classes.

**Senior Seminar is not a requirement for those majors doing a Senior Honors Thesis.

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MINOR IN PSYCHOLOGY

Required 20 credits, including:

Psyc 111 .................Introduction to Psychology .....................(3)
Psyc 241 .................Introduction to Statistics .....................(4)
Psyc 303 .................Research Methods in Psychology ..........(4)
Psyc 436 .................Perception ........................................(4)
Psyc 437 .................Psychophysiology ............................(3)
Psyc 439 .................Cognitive Psychology ........................(3)

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OPTIONALEMPHASIS

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, (CCN) 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

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. Prerequisites: Math 103 or 104. Descriptive and inferential statistics as applied to psychological measurement and experimentation. F, S

250. Developmental Psychology, (CCN) 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

260. Abnormal Psychology, (CCN) 5 credits. Prerequisites: Psyc 111 and three additional hours of psychology. A survey of the classification, symptoms, and etiology of psychological disorders and behavior pathology. F, S

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

311. Behavior Modification and Therapy, 3 credits. Theory and practice in the application of operant and classical conditioning procedures to humans in applied settings. F, S

355. Adolescence and Aging, 3 credits. Prerequisite: Psyc 111 plus 3 credits of Psychology. Basic findings and theoretical issues in the study of human aging from biopsychological 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, S

361. Research in 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 186). S

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

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Required in other departments:

Math 103 ..................College Algebra ....................................(3)
Math 104 ..................Finite Mathematics .............................(3)

Any two of the following:

Biol 150 & 150L .............General Biology I & Laboratory ............(4)
Biol 151 & 151L .............General Biology II & Laboratory ..........(4)
Anat 204, 204L .............Anatomy for Paramedical Personnel (with laboratory) .........(5)

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 of biological or physical sciences or calculus.
Public Administration

(Pols)

M. Kweit (Chair), R. Kweit (Adviser), Jensen, Jendrysik, Light, and Sun

The Faculty 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) in professional, technical, and liberal arts.

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..................Elements of Accounting I & II.............................(6)
Ecls 217..................Fundamentals of Management............................(4)
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)
Math 104..................Finite Mathematics........................................(3)
Pols 115, 116.............American Government I, II.................................(6)
Comm 110..................Fundamentals of Public Speaking......................(3)
Pols 250..................Politics of Public Administration..........................(3)

IV. GENERAL PUBLIC ADMINISTRATION

Required:

Acct 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)
Elections (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..........................(3)
Pols 404..................Urban Politics and Administration........................(3)
Pols 432..................Public Policy Making Process................................(3)
Pols 437..................Administrative Processes....................................(3)
Mgmt 305..................Managerial Concepts, or its Equivalent..............(3)
Soc 431..................Organizations and Behavior....................................(3)
Other Courses may be elected with the consent of the Department.

Courses

115. American Government I. (CCN) 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. (CCN) 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

306. Introduction to Research Methods. 3 credits. Prerequisite: a statistics course prior to enrollment. 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
Recreation and Leisure Services (RLS)

T. Schroeder (Program Coordinator), James, and Mahar

The belief that individuals and society benefit from leisure activity and recreational pursuits underlies the mission of the Recreation and Leisure Services program, which is to promote enhanced quality of life through recreation, leisure, activity, and sport for the people of North Dakota and beyond. The Recreation and Leisure Services Program works toward this mission through the professional preparation of students for careers in recreation, therapeutic 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 professional organizations on the state, regional, and national levels.

Educational Programs

Housed in the Department of Social Work, 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 may 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 Psych 111, Soc 110, and Comm 110 are required for admission. Students interested in admission should consult the Social Work 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)
Rehabilitation and Human Services (RHS)

Bailey, 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 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 Social Work, which is part of the College of Education and Human Development.

Students may apply for admission to the Rehabilitation and Leisure 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.

B.S. INREHABILITATION 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 (32 credits):

RHS 250. Contemporary Issues in Rehabilitation .............................................(3)
RHS 309. Medical and Psychosocial Aspects of Disability I .............................(3)
RHS 310. Medical and Psychosocial Aspects of Disability II ...........................(3)
RHS 455. Rehabilitation Process ......................................................................(3)
RHS 457. Vocational Development in Rehabilitation ......................................(3)
RHS 465. Professional Issues in Rehabilitation ..............................................(2)
RHS 475. Testing and Assessment ....................................................................(3)
RHS 491. Rehabilitation Field Seminar ............................................................(2)
RHS 497. Internship in Rehabilitation ...............................................................(10)

IV. Other Required Courses (16 credits):

Swk 205. Introduction to Helping Skills ..............................................................(2)
Swk 256. Social Welfare ....................................................................................(2)
Swk 333. Research and Statistics I .....................................................................(3)
Swk 334. Research and Statistics II ....................................................................(3)
Swk 418. Social Policy Analysis .........................................................................(2)

V. At Least One Concentration from the Following (10 credits):

1. Substance Abuse

Swk 410. Drugs: Addiction Dynamics ..............................................................(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)
RHS 360. Inclusion in Recreation Settings .......................................................(3)
Phrm 315. Introduction to Pharmacology .........................................................(3)
Pitx 410. Drugs Subject to Abuse ......................................................................
Psyc 270. Abnormal Psychology ......................................................................(3)
Soc 355. Drugs and Society ............................................................................(3)

2. Mental Health

RHS 375. Community Living Topics: Severe Mental Illnesses.......................(3)

Plus a minimum of 7 credits from the following:

RHS 201. Leisure and Society ..........................................................................(3)
RHS 360. Inclusion in Recreation Settings .......................................................(3)
Psyc 270. Abnormal Psychology ......................................................................(3)
Psyc 360. Introduction to Personality ...............................................................(3)
Swk 493. ST: Children’s Mental Health ............................................................(2)
T&L 316. Introduction to the Emotionally Disturbed Child ..............................(2)

3. Gerontology

Swk 354. Orientation to Gerontology ...............................................................(2)

Plus a minimum of 8 credits from the following:

CSD 365. Aging in the Communication Process ............................................(3)
RHS 201. Leisure and Society ..........................................................................(3)
RHS 360. Inclusion in Recreation Settings .......................................................(3)
RHS 363. Therapeutic Recreation for the Elderly ............................................(3)
Nurs 418. Physical Changes in Aging ...............................................................(3)
Psyc 355. Adulthood and Aging ......................................................................(3)
Soc 352. Aging ...................................................................................................

4. Developmental Disabilities

RHS 375. Community Living Topics: Developmental Disabilities ................(3)

Plus a minimum of 7 credits from the following:

RHS 201. Leisure and Society ..........................................................................(3)
RHS 360. Inclusion in Recreation Settings .......................................................(3)
T&L 315. Education of Exceptional Students ...................................................(3)
T&L 317............Education of Mentally Handicapped Students..............(3)
T&L 318............Introduction to Learning Disabilities..............(2)
T&L 421............Transition to Adult Life..............(2)
CSD 101............American Sign Language I..............(2)

VI. Cultural Diversity (6 credits from the following):
Anth 171............Introduction to Cultural Anthropology..............(3)
Anth 379............Cultures of India..............(3)
Anth 465............Cultures of Pakistan..............(3)
IS 121............Introduction to Indian Studies..............(3)
IS 151............White Images of Native Americans..............(3)
IS 345............Contemporary African American Issues..............(3)
IS 370............North American Indians..............(3)
REL 101............Introduction to Religion (West)..............(3)
REL 102............Introduction to Religion (East)..............(3)
REL 116............Women and Religion..............(3)
Soc 250............Diversity in American Society..............(3)
Soc 340............Sociology of Gender and Sex Roles..............(3)
Soc 346............Social Inequality..............(3)
SWK 493............ST. Religion and Spirituality..............(2)
CSD 101............American Sign Language I..............(2)

Other courses as approved by RHS advisers.

VII. Extra-Departmental Requirements (30 credits):
Economics........................................................................(1)
Any Course........................................................................(1)
Engl 125............Technical and Business Writing..............(3)
History........................................................................(1)
Any Course........................................................................(1)
Literature........................................................................(1)
Any Course (English Department).........................(3)
Mgmt 305............Managerial Concepts.........................(3)
Political Science........................................................................(3)
Psychology, 200 level or above....................................................(6)
Sociology, 200 level or above....................................................(6)

MINOR IN REHABILITATION AND HUMAN SERVICES
(20 credits)
I. Required Courses (15 credits):
1. RHS 250............Contemporary Issues in Rehabilitation..............(3)
2. RHS 309............Medical and Psychosocial Aspects of Disability I..............(3)
OR RHS 310............Medical and Psychosocial Aspects of Disability II..............(3)
3. RHS 455............Rehabilitation Process..............(3)
4. RHS 457............Vocational Development in Rehabilitation..............(3)
5. RHS 475............Testing and Assessment..............(3)

II. Elective Courses (5 credits from the following):
Anat 204............Anatomy for Paramedical Personnel..............(3-5)
CS 343............Language Development..............(3)
CS 353............Language Disorders..............(3)
ISBE 431............Career and Educational Counseling..............(3)
Nurs 490............Transcultural Health Care Theories..............(3)
PT 493............Psychosocial Aspects of Disability..............(2)
Psych 270............Abnormal Psychology..............(3)
RHS 375............Community Living Topics..............(3)
RHS 360............Inclusion in Recreation Settings..............(3)
RHS 361............Principles of Therapeutic Recreation..............(2)
SWK 311............Child Welfare..............(3)
SWK 342............Social Work and the Legal Process..............(2)
SWK 493............ST. Children’s Mental Health..............(2)
T&L 315............Education of Exceptional Students..............(3)
T&L 421............Transition to Adult Life..............(2)
T&L 428............Assistive Technology..............(1)
CSD 101............American Sign Language I..............(2)

Courses

250. Contemporary Issues in Rehabilitation. 3 credits. This course introduces students to the profession of rehabilitation and examines how persons with disabilities are treated in our society. Topics include: community and national rehabilitation agencies, political and social influences on rehabilitation programs, conceptualization of disability, attitude development and change, building accessible and inclusive communities, and transforming the media. Opportunities for involvement with agencies providing rehabilitation services will be provided. F:S

309. Medical & Psychosocial Aspects of Disability I. 3 credits. This course provides a basic medical and psychosocial understanding of physical disability for human service workers. It is the first of a two-course sequence which covers medical terminology, causes, treatment, and prognosis of major disabilities; and the vocational and psychosocial impact of these disabilities. F:S

310. Medical and Psychosocial Aspects of Disability II. 3 credits. This course provides a basic medical and psychosocial understanding of developmental, psychiatric, and learning disabilities for human service workers. It is the second of a two-course sequence which covers medical terminology, causes, treatment, and prognosis of major disabilities; and the vocational and psychosocial impact of these disabilities. F:S

375. Community Living Topics. 3 credits. Repeatable to a maximum of 6 credits. This course provides an introduction to independent living for special populations, such as individuals with physical disabilities, developmental disabilities, or serious emotional disturbances. Topics include: community-based programming, the deinstitutionalization movement, legislative issues, and the concepts of integration, inclusion, and normalization. F:S

455. Rehabilitation Process. 3 credits. This course examines the history, philosophy, and ethical standards of the rehabilitation profession. Topics include the following: experiences of people with disabilities throughout history, legislation affecting persons with disabilities, public and private rehabilitation systems, case management principles, role and function of rehabilitation counselors, principles of independent living, and community resources utilized in rehabilitation programs. F:S

457. Vocational Development in Rehabilitation. 3 credits. This course examines the relationship between work and disability in American society. Topics include: theories of career decision making, work values, employment opportunities and barriers for people with disabilities, sources of occupational information, job accommodations, vocational planning and job development, work adjustment training, affirmative action guidelines, and vocational placement strategies. F:S

465. Professional Issues in Rehabilitation. 2 credits. Prerequisite: Consent of instructor. This course is designed to provide an integrative experience for the senior rehabilitation and human services student. The focus of the course will be on the exploration of the philosophical and ethical base of the profession and professional education. Professional issues and ethical dilemmas will provide the context for further development and application of critical thinking and decision making skills. F:S

475. Testing and Assessment. 3 credits. This course introduces the student to basic principles of testing and assessment that can be used with individuals who have disabilities. Various approaches to evaluation are explored, including assessment interviewing, psychometric testing, work samples, and situational assessment. F:S

491. Rehabilitation Field Seminar. 2 credits. Prerequisite: RHS 465. Co-requisite: RHS 497. This seminar is designed to integrate the rehabilitation curriculum content with actual rehabilitation practice while in the internship. This is accomplished through presentations, peer discussions, and video presentations. F:S

497. Internship in Rehabilitation. 10 credits. Prerequisite: RHS 465. Co-requisite: RHS 491. S/U grading only. This course consists of a one semester block placement requiring 480 total hours (40 hours weekly) in an approved rehabilitation agency with an approved rehabilitation field instructor. The agency-based practicum, guided by a student’s learning plan, provides students with learning opportunities to develop and to integrate rehabilitation knowledge, values and skills at the beginning level of generalist practice. Learning opportunities emphasize the integration of research, problem solving processes and skills, knowledge of rehabilitation programs and policies, understanding disability issues, use of self, and values and ethics of the rehabilitation profession. Upon completion of the internship, students will have experienced practice with individuals, groups, families, organizations and communities. Field instructors in conjunction with department faculty complete midterm and final evaluations of student performance. Applications for Field Instruction are submitted two semesters preceding the beginning of this course. F:S

Reserve 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, 261 Clifford Hall, University of North Dakota, Grand Forks ND 58202, (701) 777-4957/4733.

The program is conducted in two phases — the General Military Courses 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 Lackland Air Force Base, Texas. 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 five weeks of field training prior to enrollment in AFROTC.

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

The five week field training course covers the same areas of study as the four week program and includes an additional week of academic instruction in general military courses.

**LEADERSHIP LABORATORY** (AS 210—1 credit, 410—1 credit) Repeatable. Instruction is conducted within the framework of a cadet organization and includes a progression of experiences designed to develop each student’s leadership potential. Leadership laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities in the Air Force, and the life and work of an Air Force junior officer. Students develop their leadership potential in a practical and supervised laboratory, which can include field trips to Air Force installations throughout the United States. AS 210 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. AFROTC Fitness. 1 credit. Repeatable. Introduction to various AFROTC team sports. Promotes benefits of being physically fit and maintaining Air Force fitness standards.

111. The Foundations of the United States Air Force I. 1 credit. Survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force.

112. The Foundations of the United States Air Force II. 1 credit. Continuation of AS 111. Provides an overview of the basic characteristics, missions, and organization of the Air Force.

210. Leadership Laboratory I. 1 credit. Repeatable. Introduction to Air Force customs and courtesies, drill and ceremonies, and military commands.

211. The Evolution of USAF Air and Space Power I. 1 credit. Introduction to Air Force heritage and leaders. Quality Air Force concepts, ethics and values, leadership, group leadership problems, and the application of communication skills.

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

321. Air Force Leadership Studies I. 3 credits. Introduction to management within the USAF, emphasizing communication skills (in both oral and written Air Force formats) and interpersonal skills.

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

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 cadre corps organization.

441. National Security Affairs/Preparation for Active Duty I. 3 credits. A study of the national security process, regional studies, advanced leadership ethics and Air Force doctrine. Topics include the military as a profession, officer corps, military justice, civilian control of the military, and current issues. Application of communication skills is included.

442. National Security Affairs/Preparation for Active Duty II. 3 credits. A continuation of AS 441. Topics include the military as a profession, officer corps, 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.

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**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 GER Credit, see University GER listing.

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**Social Work (SWK)**

Bailey, Haga, Heitkamp, Houston, B. Jacobsen, M. Jacobsen, Kraft, Monette, Muhlhauser, Perry, Rembold, Stevens, Swenson, and Woehle

The undergraduate social work program is accredited by the Council on Social Work Education (CSWE). Graduates of this program are eligible for regular membership in the National Association of Social Workers and may also be eligible for advanced standing in many graduate schools of social work. The program leads to the Bachelor of Science in Social Work (BSSW) degree.

The social work curriculum builds on the base of the baccalaureate program liberal arts. The principal goal of the social work program is to prepare students for beginning social work practice. A second goal is to prepare students for graduate social work education or other graduate programs in human service related fields.

Students who are interested in majoring in social work should register their intent with the department at the beginning of the freshman year, if possible. At that time students will be assigned an adviser from the Social Work Department to help them make an informed choice about majoring in social work and to assist them with their academic planning.

Minimum technical standards for admission into the social work program are:
a. ability to communicate in such a manner as to facilitate a helping relationship in the delivery of services.
b. mobility sufficient to perform essential work-related activities.
c. personal resources (psychological, social and intellectual) that facilitate the use of self in a helping manner in a social work setting.

Students are required to make application for admission to the social work program. Criteria for admission are as follows:

1. completion of 45 semester hours of course work.
2. attainment of a cumulative GPA of 2.40 or better.
3. completion of four social work courses: SWK 200 Intro to Helping Skills, SWK 255 Social Work in a Modern Society, SWK 256 Social Welfare, SWK 257 Human Behavior in the Social Environment — or their equivalent (as approved by the social work faculty) with a grade of “C” or better. The combined GPA for these four courses must be at least 2.50.
5. evidence of at least 40 hours volunteer or paid work in a community service agency within two years preceding application for admission. (Examples of acceptable community service agencies are: human service agencies, hospitals, Y Family Centers, social/recreational centers, nursing homes). Volunteer activities must be approved by the student’s academic adviser.
6. social work students must agree to read and abide by the Social Work code of Ethics and UND Student Code of Conduct.

Admission to the social work program is on a competitive basis and occurs twice each academic year. Admissions are limited by availability of departmental resources. Therefore, a maximum of forty students may be admitted each year. Acceptance into the program is currently based upon the applicant’s grade point average, written statement, personal interview, volunteer experience and other personal qualifications.

Students who have previously been admitted to the social work program but have not enrolled in a social work base course for six consecutive semesters (excluding summer sessions) must re-apply for admission to the program before enrolling in any social work base course. In accordance with accreditation standards, departmental requirements at the time of readmission shall constitute the student’s required program of study.

Social work majors must achieve an overall GPA of 2.40 and a grade of “C” or better in all social work base courses in which they were enrolled prior to enrolling in Field Instruction.

Students transferring to the UND Department of Social Work, who have completed social work courses at other institutions, will only receive credit for upper division (300-400 level) practice course work taken from a CSWE accredited BSW program. Students who wish to transfer social work credit from courses completed at a previous accredited institution will also need to have course equivalency determined by the UND course instructor and the BSSW coordinator. Students must complete at least 20 semester hours of core social work courses at UND prior to graduation. The transfer student must also apply for admission to the department before proceeding to the practice courses and/or field experience.

There are special requirements while enrolled in SWK 487: Field Instruction. The student is responsible for travel, housing and food costs in addition to the payment of tuition while in the semester-long placement.

The faculty reserves the right not to place a student in a field instruction agency and to remove a student from SWK 487: Field Instruction if performance is unsatisfactory. Students are encouraged to complete the field practicum experience during the last semester in which they are enrolled prior to graduation.

**College of Education and Human Development**

**B.S. IN SOCIAL WORK**

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 Education and Human Development (see College listing).
III. The Following Curriculum.

A. Base (41 hours)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWK 200</td>
<td>Intro to Helping Skills</td>
<td>(2)</td>
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<tr>
<td>SWK 255</td>
<td>Social Work in a Modern Society</td>
<td>(3)</td>
</tr>
<tr>
<td>SWK 256</td>
<td>Social Welfare</td>
<td>(2)</td>
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<tr>
<td>SWK 257</td>
<td>Human Behavior in the Social Environment</td>
<td>(4)</td>
</tr>
<tr>
<td>SWK 322</td>
<td>Foundation for Generalist Social Work Practice</td>
<td>(2)</td>
</tr>
<tr>
<td>SWK 333</td>
<td>Research and Statistics in Social Work I</td>
<td>(3)</td>
</tr>
<tr>
<td>SWK 334</td>
<td>Research and Statistics in Social Work II</td>
<td>(3)</td>
</tr>
<tr>
<td>SWK 418</td>
<td>Social Policy Analysis</td>
<td>(2)</td>
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<tr>
<td>SWK 450</td>
<td>Social Work Practice with Micro Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>SWK 454</td>
<td>Social Work Practice with Large Systems</td>
<td>(3)</td>
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<tr>
<td>SWK 460</td>
<td>Senior Seminar</td>
<td>(2)</td>
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<tr>
<td>SWK 487</td>
<td>Field Instruction</td>
<td>(4-10)</td>
</tr>
<tr>
<td>SWK 488</td>
<td>Field Instruction Seminar</td>
<td>(1-2)</td>
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<tr>
<td>Biol 111</td>
<td>Concepts of Biology</td>
<td>(3)</td>
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<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking</td>
<td>(3)</td>
</tr>
<tr>
<td>Economics</td>
<td></td>
<td>(3)</td>
</tr>
<tr>
<td>History</td>
<td>(three credit hour course only)</td>
<td>(3)</td>
</tr>
<tr>
<td>English</td>
<td>(Literature Department)</td>
<td>(4)</td>
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<tr>
<td>Poles</td>
<td>American Government I</td>
<td>(3)</td>
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<tr>
<td>Psychology</td>
<td>(upper division) may include Abnormal Psych (270)</td>
<td>(6)</td>
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<tr>
<td>Sociology</td>
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</tr>
<tr>
<td>Cultural Diversity</td>
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<td>(6)*</td>
</tr>
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</table>

*Selected from the following:

- Anth 171 Intro to Cultural Anthropology
- Anth 379 Culture Area Studies
- Anth 465 Culture, Illness & Health
- A&S 225 Intro to Study of Women
- Engl 265 Native American Literature
- Engl 357 Women Writers & Readers
- IS 121 Intro to Indian Studies
- IS 203 Intro Survey of Chippewa History
- IS 207 History of Three Affiliated Tribes
- IS 255 Cross-Cultural Seminar
- IS 301 History of Western Sioux
- IS 330 Contemp Plains Indian Culture
- IS 345 Contemp Amer Indian Issues
- RHS 250 Contemp Issues in Rehab
- Soc 436 Social Inequality

A total of 38 hours is required and a given course may not be used to satisfy more than one requirement within this section. "A laboratory science course is a requirement."

Courses used to fulfill the approved minor requirements may also be used to meet the above requirements wherever appropriate and applicable.

MINORS

Students are encouraged to declare either a University approved minor or, in conjunction with their adviser, develop a unique set of elective courses tailored to their future professional interests. This selection should be made at the time of admission to the Department and should be made after consultation with the faculty adviser.

**GERONTOLOGY MINOR**

Required: 20 credits including:

1) The following eleven hours:

   a. Physical Changes of Aging
   b. Adulthood and Aging
   c. Orientation to Gerontology
   d. Aging

2) Nine hours from the following:

   a. Aging and Communication Processes
   b. Introduction to Philosophy
   c. Contemporary Moral Issues
   d. Ethics
   e. Introduction to Indian Studies
   f. Technology and Society
   g. Fundamentals of Nutrition
   h. Individual and Group Differences
   i. Inclusion in Recreational Setting
   j. Leisure Education and Counseling
   k. Sociology of Death and Dying
   l. Medical Sociology
   m. Social Welfare
   n. Human Behavior in the Social Environment

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:
   *PSY 410 Drugs Subject to Abuse (2)
   *SOC 355 Drugs and Society (3)
2) Thirteen from the following:
   *Coun 301 Psychology of Communication (3)
   *Coun 565 Dynamics of Addiction Seminar: Special Topics in Chemical Use/Abuse (2)
   EHD 495 SP: International School of Alcohol Studies (1)
   IS 345 Contemporary American Indian Issues (3)
   *Psyc 360 Introduction to Personality (3)
   *Psyc 270 Abnormal Psychology (3)
   Soc 102 Social Problems (3)
   Soc 355 The Family (3)
   RHS 309 Medical & Psychosocial Aspects of Disability (3)
   *T&L 350 Development & Education of Adolescents (3)
   *Course required for licensing in addiction counseling.

SOCIALWELFARE MINOR
20 semester credits:
This minor is for non-social work majors. Note: A minor in Social Welfare is not accepted by the Council on Social Work Education as adequate preparation for entry level social work practice; neither does a minor in social welfare qualify students to take state licensure examinations. This minor is offered solely for students learning in the area of social services.

Eleven hours from these required courses:
SWK 255 Social Work in a Modern Society (3)
SWK 256 Social Welfare (2)
SWK 257 Human Behavior in the Social Environment (4)
SWK 418 Social Policy (2)

Note: These courses have the following prerequisites:
Soc 110, Psyc 111 (3), Pol 115, Biol 111 (3), and SWK 333 (3).

Nine hours from the following:
CJS 251 Introduction to Criminal Justice (3)
RLS 201 Leisure & Society (3)
RHS 250 Contemporary Issues in Rehabilitation (3)
RHS 375 Community Living Topics (3)
SWK 311 Child Welfare (3)
SWK 342 Social Work and the Legal Process (3)
SWK 410 Drugs: Addiction Dynamics (2)
SWK 493 Special Topics: Family Violence (2)
SWK 493 Special Topics: Mental Health (2)

OTHERMINORS: Additional minors that the social work major should consider are Communication, Criminal Justice Studies, Indian Studies, Psychology, Rehabilitation and Human Services, Sociology, or Spanish.

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) 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 meet the required graduate program of study, the required addiction courses, and the nine-month practicum. For more complete details, please contact the Department of Social Work or the Department of Counseling.

Courses
200. Introduction to Helping Skills. 2 credits. This course provides the basic knowledge and skills associated with the helping process, including interview skills. A special focus will be on the problem solving process and interaction skills used in direct service activities with individuals. F,S
255. Social Work in a Modern Society. 3 credits. This course is designed to provide an introduction to the profession of social work. Course content includes the development of the profession; the assumptions which underlie social work goals, functions, and methods; the basic professional values guiding practice; and description of practice methods. The course also provides an opportunity for the student to learn about the settings and roles in which social workers practice the profession. F,S
256. Social Welfare. 2 credits. Prerequisites: Soc 110, Pol 115 or consent of instructor. This course provides an introduction to the development of social welfare, its historic landmarks, and the values and ideologies that influence its formulation. Information about inequality, and the major social welfare programs that benefit the disadvantaged, is included. The course will also provide a basic analytic model to evaluate social welfare policies. F,S
257. Human Behavior in the Social Environment. 4 credits. Prerequisites: Psyc 111, Biol 111 and Soc 110. This foundation course uses ecological/social systems theory as the overall conceptual framework. Bio-psycho-social-cultural aspects of human development are emphasized along with a recognition of the reciprocal interactions and transactions of multiple systems that influence human development throughout the life span. A paradigms framework is used for presenting human behavior theory and diversity. F,S
311. Child Welfare. 3 credits. This course provides a historical perspective regarding the social, legal and economic status of childhood; study of the special status of childhood in a modern society; and the provisions used to address the needs of children and their families. S
322. Foundation for Generalist Social Work Practice. 2 credits. Prerequisite: Formal admission to the BSSW Program. This course provides the student with an overview of the knowledge and values for generalist social work practice. Focus of the course is on the problem solving process within the context of an ecological systems perspective. F,S
333. Research and Statistics in Social Work I. 3 credits. Prerequisite: Formal admission to the BSSW program or consent of the instructor. This course provides an orientation to current research practices in social work. Emphasis is placed on the scientific and systematic evaluation of service delivery and professional practice. An introduction to statistical analysis in social work settings is provided. F
334. Research and Statistics in Social Work II. 3 credits. Prerequisite: SWK 333. This course provides a further development of research design and methodology in social work. Topics such as single subject research, experimental designs, survey research, and other qualitative and quantitative research designs are presented. Students are introduced to inferential statistical techniques as utilized in social work practice. In addition, students will learn how to obtain solutions to statistical problems through the use of computer programs. S
342. Social Work and the Legal Process. 2 credits. This course provides an introduction to the human service delivery system and its interface with the legal system.
354. Orientation to Gerontology. 2 credits. A general introduction to gerontology including the study of the aging process, the relationship between the theoretical and practice aspects of aging, and the interdisciplinary nature of practice. F
397. Cooperative Education. 1-6 credits. Prerequisite: SWK 322 or consent of instructor. This course offers students individually supervised practical experiences in a human service agency. Students will be expected to integrate social work practice with practice. Students need to contact the Cooperative Education Office. F,S,SS
410. Drugs: Addiction Dynamics. 2 credits. Prerequisite: Junior standing. This course is an introduction to the dynamics of drug addiction and related drug abuse issues. Special emphasis will be placed on alcohol as the most frequently used and abused drug. S
418. Social Policy Analysis. 2 credits. Pre- or corequisite: SWK 333, 454, or consent of the instructor. This course provides the opportunity to develop knowledge of social welfare policy including financial assistance policy; social service policy; ideology and values; policy making processes; and, the regional context. The emphasis is on policy analysis including the use of information by government and social service agencies; the application of theories and models; and, data collection. F,S
450. Social Work Practice with Micro Systems. 3 credits. Prerequisite: Formal admission to the BSSW program and SWK 322. This course is designed to provide knowledge about generalist social work practice with individuals in groups and individuals in families. This course includes the required knowledge, values, and skills necessary for practice with micro systems. Students will continue to build on the problem solving model as presented in SWK 322 and the skills acquired in Swk 200. An opportunity for skill development will be provided in the practice lab. F,S
454. Social Work Practice with Large Systems. 3 credits. Prerequisites: SWK 450 or consent of instructor. Corequisite: Swk 418. The focus of this course is on the study of the knowledge, values and skills necessary for practice with large systems. The role of the generalist in social work practice in organizations, communities and formal groups is emphasized, including the approaches to human behavior and large systems social change. An opportunity for skill development will be provided in the community. F,S
460. Senior Seminar. 2 credits. This course is designed to provide an integrative experience for the senior social work student. The focus will be on the exploration of the philosophical and ethical base of the profession and professional education. Professional issues and ethical dilemmas will provide the context for the further development and application of critical thinking and decision making skills. F,S
487. Field Instruction. 4-10 (repeatable to 10 credits) Prerequisites: SWK 454 and 460. Corequisite: Swk 488. SU/grading only. This course consists of a one semester block placement requiring 40 hours weekly in an approved social welfare agency. The agency-based practicum will provide students with learning opportunities to develop and integrate social work knowledge, values and skills for beginning level generalist practice. Learning opportunities will emphasize the integration of research, problem solving processes and skills, knowledge of social welfare programs and poli-
Sociology
(Soc)

J. Larson (Chair), Crawford, Driscoll, Di Cristina, Gottschalk, Huffman, Hume, Ludtke, Meyer, Moen, Staples, Stofferahn, Tiemann, and White

This department offers a major and minor in sociology and it houses the program in Criminal Justice. 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 students may be offered for credit from courses in the department. Some sociology background is usually necessary for upper level courses even when no specific prerequisite is listed.

College of Arts and Sciences
B.A. WITH A MAJOR IN SOCIOLOGY

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

I. General Education Requirements (see University GERlisting).
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 (2 credits)

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 proficiency of level IV in a modern foreign language or
2. 20 credits 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. (CCN) 3 credits. An introductory analysis of the nature of society, the interrelationships of its component groups and the process whereby society persists and changes. Interpretation of human behavior from the standpoint of the group. Students wishing to earn credit from Soc 110 by means of independent study should obtain information from the University counseling center on the CLEP examinations administered there. F, S

115. Social Problems. (CCN) 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. 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 main trends in the history of sociological thought. 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.

322. Sociological Research Methods, 3 credits. Prerequisite: Soc 301 or CJS 301. 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 102 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 CJS 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. S

353. Sociology of Death and Dying, 3 credits. The study of sociological aspects of death and dying as they involve the individual, the family, organizations, and life-and-death decisions. S

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 CJS 301 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. F

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, (CCN) 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
492. Practicum in Sociology. (CCN) 3 credits. Prerequisite: Soc 301, 323, 326 and at least junior status. Students enrolled in this practicum will be assigned to work on research under the direction and control of a faculty member. Specific arrangements must be made with the instructor prior to registration. F.S

494. Readings in Sociology. (CCN) 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

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**Space Studies (SpSt)**

**John D. Odegard School of Aerospace Sciences**

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 high-tech areas in a major field of study.

**Political, legal, and scientific aspects** are dealt with extensively, and key technologies are introduced. Whether or not the student goes on to a career in the space field, useful knowledge will be gained regarding the development and operation of high-tech systems.

**MINOR IN SPACE STUDIES**

Required 20 credits, including:

- SpSt 200. Introduction to Space Studies (3)
- SpSt 491. Independent Study (2)
- 12 credits from:
  - 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 440. Commercialization of Space (3)
  - SpSt 450. Soviet/Russian Space Program (3)
  - SpSt 470. Special Topics in Space Studies (3)
- Space Studies electives (3)

**Courses**

400. Introduction to Space Studies. 3 credits. An introduction to a range of topics in space studies including a broad 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. P.S

405. Advanced Space Mission Design. 3 credits. A team design project to develop the requirements for a space mission. The specific mission will vary from time to time. Design teams will work on selected portions of the mission. Accompanying lectures will provide background material. S

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 conceptual cosmology as well as an overview of planetary evolution, solar system dynamical processes and physical characteristics of the planets. S

425. Observational Astronomy. 3 credits. This course will provide an overview of observational astronomy with particular emphasis on planetary astronomy. Students will learn to use the departmental observatory (near Grand Forks AFB), the 18" telescope there, and digital imaging with a CCD camera. Each student will set up the telescope and camera, acquire a target, record the image data, and process it in the laboratory. On Demand.

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 biogeochemical processes. The role of human activities on Earth processes and the consequences of global environmental changes are discussed. The growing use of space-based data sets and the implications of Earth Observing System technologies, including research goals and hardware requirements, are examined. F

435. Global Change. 3 credits. Prerequisite: SpSt 200 (undergrad) or SpSt 501 (grad). Investigation of environmental changes, often occurring locally, which contribute to large scale global transformations. Some of these changes are natural, others are a consequence of human activity. Topics include: climatic impacts, population growth, volcanic eruptions, deforestation, biodiversity, water management, global warming, ozone and sustainable societies. S

440. Commercialization of Space. 3 credits. Prerequisite: SpSt 200. A study of the current state of commercial space activities, with analysis of the possibilities and the barriers. Key areas include launch services, satellite communications, remote sensing, microgravity materials processing, and interaction with the government. Global competition against subsidized or government-sponsored entities is examined. S

450. Soviet/Russian Space Program. 3 credits. Prerequisite: SpSt 200 (undergrad) or SpSt 501 (grad). From the launch of the world’s first satellite to the present space station, the Soviet Union and Russia have dominated the world’s space stage. A study of the Soviet/Russian Space Program determines why this country has been successful in its space exploration despite economic and cultural chaos. This course presents the development of the Russian Space Program from its earliest roots to its plans for collaboration with the United States on an International Space Station.

451. History of the Space Age. 3 credits. This course introduces students to the history of human endeavors in space. These include the development of rocketry, the influence of amateur societies and science fiction, the military development of ballistic missiles, and human and robotic spaceflight. F.S

460. Life in the Universe. 3 credits. 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. F.S-SS

470. Special Topics in Space Studies. 1-3 credits. Prerequisite: consent of instructor. 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. Topics have included: Global Change; Life in the Universe, Asteroids, Comets and Meteorites; Planet Venns; and Manned Exploration of Moon and Mars. On Demand.

480. Reading in Space Studies. 1-3 credits. Prerequisite: consent 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

491. Independent Study. 2 credits. Prerequisite: Senior standing and 15 hours of Space Studies. An independent study project culminating in a paper on an approved topic in Space Studies. Requires weekly meetings with the student’s assigned adviser. F.S

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The University of North Dakota has offered teacher education programs since its founding in 1883. The Department of Teaching and Learning is a comprehensive, accredited, undergraduate and graduate department of education. It supports a broad view of education and seeks to serve preservice and inservice teachers and other education personnel with intensive, intellectually challenging, integrated study.

The Department strives to model the kind of educational environment it is promoting in early childhood settings, elementary schools, middle schools and secondary schools. Students are encouraged to assume initiative and independence in their learning while developing personal and professional commitments and competence. To help meet this expectation, programs in the Department of Teaching and Learning are designed to encourage students to participate in the formation of goals and policy at all levels of education, to Native American communities in their efforts to improve education, and to classroom teachers committed to continue their personal and professional learning.
Teacher education programs at the University of North Dakota are approved by the State of North Dakota and accredited by the National Council for the Accreditation of Teacher Education and are in compliance with Title II, Higher Education Act reporting procedures. The University is accredited by the North Central Association.

**Degree Programs**

The Department offers degree programs at the undergraduate level in the preparation of early childhood, elementary, middle and secondary school teachers. Students studying elementary education are also able to pursue specialized study resulting in a combined major in visual arts, early childhood education, physical education, middle level music, or mathematics. At the secondary level students must, in addition to their professional coursework, concentrate in an area typically taught at the secondary school. At the present time, the following areas have been approved:

- Biology
- Business Education
- Chemistry
- English
- Fisheries and Wildlife
- French
- Geology
- German
- Industrial Technology
- Marketing Education
- Mathematics
- Physics

The appropriate sequences of courses and experiences for these majors are outlined under the specific departments offering the majors. Kindergarten through grade 12 majors are also available in music and physical education.

See the College of Education and Human Development listing for information regarding admission to teacher education, graduation and teacher certification 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). Due to licensure requirements in the state of North Dakota, additional coursework may be required. Please see an Early Childhood academic adviser 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:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>T&amp;L 252</td>
<td>Child Development</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 300</td>
<td>Introduction to Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 406</td>
<td>Field Experience in Early Childhood Education</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 311</td>
<td>Observation &amp; Description of Young Children</td>
<td>3</td>
</tr>
<tr>
<td>SWK 311</td>
<td>Child Welfare</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 313</td>
<td>Young Children’s Language &amp; Thought</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 314</td>
<td>Social &amp; Emotional Lives of Young Children</td>
<td>3</td>
</tr>
<tr>
<td>Soc 335</td>
<td>The Family</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 315</td>
<td>Education of the Exceptional Student</td>
<td>3</td>
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<tr>
<td>T&amp;L 311</td>
<td>Early Intervention for Children with Special Needs</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>3</td>
</tr>
<tr>
<td>IS 121</td>
<td>Introduction to Indian Studies</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 435</td>
<td>Home-School Relations</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 451</td>
<td>Methods &amp; Materials: Pre-Kindergarten</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 452</td>
<td>Developing Personal Teaching Styles</td>
<td>1</td>
</tr>
<tr>
<td>T&amp;L 453</td>
<td>Methods &amp; Materials: Kindergarten</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 454</td>
<td>Organization, Administration &amp; Supervision</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 455</td>
<td>Comparative Approaches to the Education</td>
<td>2</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
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<tr>
<td>T&amp;L 456</td>
<td>Pre-Kindergarten Seminar</td>
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</tr>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching: Pre-kindergarten</td>
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**MINOR IN EARLY CHILDHOOD EDUCATION**

20 credits including:

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>T&amp;L 310</td>
<td>Introduction to Early Childhood Education</td>
<td>3</td>
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<td>T&amp;L 311</td>
<td>Observation &amp; Description of Young Children</td>
<td>3</td>
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<td>Young Children’s Language &amp; Thought</td>
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<tr>
<td>T&amp;L 314</td>
<td>Social &amp; Emotional Lives of Young Children</td>
<td>3</td>
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</tbody>
</table>

**T&L 435**  Home School Relations          (3)
**T&L 451**  Methods & Materials: Pre-K      (3)
**T&L 486**  Field Experience: ECE          (2)

**B.S. ED. WITH MAJOR IN ELEMENTARY EDUCATION**

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

**I. 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 3 departments including Psych 250 or T&L 252 (but not both); 9 additional credits of University General Education courses from Anthropology, Economics, Geography, Political Science, Psychology (except 250), Sociology, or Indian Studies.

**Arts and Humanities** — 12 credits

From 3 departments including 9 credits from English, History, or Humanities I and II, including courses from at least two departments; 3 credits of studio visual arts (Art 100, 120, 130, 151, 173, 260) and/or performance classes from music (Music 105, 260, 261, 264, 265, 269), Theatre (Thea 200, 225, 227, 229), and 3 credits of electives from University General Education courses on pages 27-31.

**Math, Science, Technology** — 12 credits

Must be taken in at least 2 departments, must include 4 hours of lab science, and must include Mathematics 103, 104, 105 or a course for which one of these is a prerequisite, or a score on the Mathematics Department placement test that qualifies the student to register for Math 165.

Students must have coursework in the biological, physical, and earth sciences. 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 competence in microcomputer operation and word processor use. This can be done by gaining credit in Csci 101 or 105, or by demonstrating competence to designated faculty or staff.

**III. Area of Concentration:**

Each student must have an area of concentration of 15 or more credits in one of the following areas: English, history, fine arts, social science (anthropology, political science, geography—social science, or economics), mathematics, science (non-T&L), a single foreign language, Indian Studies, Women Studies, Psychology, Sociology, Special Education, Early Childhood Education, Physical Education, Bilingual Education/ESL, or Interdisciplinary Studies.

Except in science, social science, fine arts, or foreign language, 9 of the 15 credits must be above the 100 level. Lists of appropriate courses for this concentration are available through your adviser.

**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)

**V. Professional Education**

**TEAM:**

T&L 410  Reading and Writing in the Elementary School (TEAMS)  (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:**

One of the following three courses:

PEXS 310  First Aid and CPR                        (2)
PEXS 327  Fitness Lifestyle                        (1)
PEXS 403  School Health Education                  (3)

**(Early Ed. Combined majors may substitute)**

One of the following three courses:

T&L 411  Primary Reading and Language Arts         (2)
T&L 412  Intermediate Language Arts                (2)
T&L 413  Assessing and Correcting Reading Difficulties  (2)
T&L 414  Corrective Reading Practicum              (1)
T&L 413 and T&L 414 are taken concurrently.  
T&L 422  Classroom Management                      (3)
T&L 433  Multicultural Education (TEAM prerequisite) or Indian Studies 121     (3)
Elementary Education Electives                    (4)
(Some courses have prerequisites.)

T&L 487  Student Teaching                          (10-16)
### SAMPLE PROGRAM OF STUDY

<table>
<thead>
<tr>
<th></th>
<th>First Semester</th>
<th>Second Semester</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>Engl 125</td>
<td>Technical &amp; Business Writing</td>
<td>(3)</td>
</tr>
<tr>
<td>Comm 110</td>
<td>Fundamentals of Public Speaking</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 252</td>
<td>Child Development</td>
<td>(3)</td>
</tr>
<tr>
<td>Psych 111</td>
<td>Intro to Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>Social Science</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Math/Science</td>
<td>(4)</td>
<td></td>
</tr>
<tr>
<td>Fine Arts</td>
<td>(2-3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2-3)</td>
<td></td>
</tr>
</tbody>
</table>

**Sophomore Year**

|                      | (3)             |
| Math/Science         | (3)             |
| Concentration courses: Math 277 Math for Elementary School Teachers (3) |
|                      | (3)             |
| PEXS 205            | Physical Edu for Elem School Teachers | (3) |
| T&L 328            | Children's Literature | (3)             |
| T&L 330            | Introduction to Teaching and Learning | (3)             |
| T&L 335            | Understanding Readers and Writers | (3)             |
|                      | (12-17)         |

**Junior Year**

| TEAM                | Elective | (14) |
| T&L 315            | Education of the Exceptional Student | (3) |
| T&L 432            | Classroom Management | (3)             |
| T&L 314            | Multicultural Education | (3)             |
| T&L 487            | Student Teaching | (16)         |
|                      | Electives or concentration | (12-17)         |

### BILINGUAL EDUCATION/ENGLISH AS A SECOND LANGUAGE ENDORSEMENT

Students who complete the courses listed below will be eligible for endorsement in Bilingual Education/English as a Second Language. Students must be certified to teach in Elementary, Middle Level or Secondary classrooms:

- T&L 313. Young Children’s Language and Thought | (3) |
- T&L 415. Reading & Writing Development of Bilingual & Second Language Learners | (2) |
- T&L 433. Multicultural Education | (3) |
- T&L 466. Field Experience: Bilingual & ESL | (2) |
- Engl 207. 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.

### B.S.ED. WITH COMBINED 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. EHD General Graduation Requirements (see EHD listing).

III. Elementary Education Curriculum as listed above.

IV. The following Elementary Education Curriculum:

- T&L 310. Introduction to Early Childhood Education | (3) |
- T&L 311. Observation and Description of Young Children | (3) |
- T&L 313. Young Children’s Language and Thought | (3) |
- T&L 314. Social and Emotional Lives of Young Children | (3) |
- T&L 455. Comparative Approaches to the Education of Young Children | (3) |
- T&L 456. Pre-Kindergarten Seminar | (2) |
- T&L 452. Developing Personal Teaching Styles | (1) |
- T&L 453. Methods and Materials: Kindergarten | (2) |
- T&L 486. Field Experience in Early Childhood Education | (1) |
- T&L 487. Student Teaching: Pre-Kindergarten | (9) |

One elective course which deals with communication with adults, to be selected with adviser approval.

### Kindergarten Endorsement

Undergraduate students who wish to add a Kindergarten Endorsement must do so within the first year of the internship. They must take the following courses of 24 credits.

- T&L 310. Introduction to Early Childhood Education | (3) |
- T&L 486. Field Experience: Early Childhood Education | (1) |
- T&L 313. Young Children’s Language and Thought | (3) |
- T&L 529. Language Development in Children | (3) |
- T&L 314. Social and Emotional Lives of Young Children | (3) |
- T&L 453. Methods and Materials: Kindergarten | (2) |

### B.S. ED. WITH COMBINED MAJOR IN ELEMENTARY EDUCATION AND MATHEMATICS

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

I. 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 Teacher | (2) |
- T&L 498. Special Projects: Math Practicum | (3) |
- BASIC Computer Programming | (2) |
- Math Electives (T&L math courses or math depr.) | (10) |

### B.S.ED WITH COMBINED MAJOR IN ELEMENTARY EDUCATION AND MUSIC

Required 127-134 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 Music Curriculum:

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Music 100. Introduction to the Understanding of Music (may be waived by examination)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Music 130, 134, 230, 234. Harmony and Theory Sequence</td>
<td>(12)</td>
</tr>
<tr>
<td></td>
<td>Music 131, 135, 231, 235. Aural Skills Sequence</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>Music 203. Popular and Classical</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>Music 256. Basic Conducting</td>
<td>(2)</td>
</tr>
<tr>
<td></td>
<td>Music 310, 311, 312. Music History Survey I, II, III</td>
<td>(9)</td>
</tr>
</tbody>
</table>

**Performance**

<table>
<thead>
<tr>
<th>Major Instrument</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensembles</td>
<td>(4)</td>
</tr>
<tr>
<td>Voice Lessons or Voice Class</td>
<td></td>
</tr>
<tr>
<td>Piano and Instrumental Principles Only</td>
<td>(1-3)</td>
</tr>
<tr>
<td>Piano Lessons or</td>
<td></td>
</tr>
<tr>
<td>Music 357. Choral Conducting</td>
<td>(2)</td>
</tr>
<tr>
<td>Music 444. Applied Music Pedagogy (vocal)</td>
<td>(2)</td>
</tr>
</tbody>
</table>
Middle Level Education

B.S. ED. WITH A COMBINED 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).

II. EHD General Graduation Requirements (see EHD listing).

III. Elementary Education Curriculum as listed above.

IV. The Following Physical Education Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEXS 107</td>
<td>Introduction to Physical Education</td>
<td>(3)</td>
</tr>
<tr>
<td>PEXS 205</td>
<td>Physical Education for the Elementary Grades</td>
<td>(3)</td>
</tr>
<tr>
<td>PEXS 223</td>
<td>Movement Performance Analysis Labs</td>
<td>(6)</td>
</tr>
<tr>
<td>PEXS 310</td>
<td>First Aid and CPR</td>
<td>(2)</td>
</tr>
<tr>
<td>PEXS 323/323L</td>
<td>Introduction to Teaching in Physical</td>
<td></td>
</tr>
<tr>
<td>PEXS 355</td>
<td>Applied Motor Development</td>
<td>(3)</td>
</tr>
<tr>
<td>PEXS 403</td>
<td>School Health Education</td>
<td>(2)</td>
</tr>
<tr>
<td>PEXS 404</td>
<td>Adapted Activities Program</td>
<td>(2)</td>
</tr>
<tr>
<td>PEXS 406/406L</td>
<td>Strategies for Teaching Physical Education in the Elementar</td>
<td>(4)</td>
</tr>
<tr>
<td>PEXS 487</td>
<td>Senior Teaching Seminar</td>
<td>(2)</td>
</tr>
</tbody>
</table>

Total: 31 credit hours

B.S. ED. WITH COMBINED MAJOR IN ELEMENTARY EDUCATION AND ART

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 Visual Arts Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art 106</td>
<td>Hand and Power Tool Safety</td>
<td>(1)</td>
</tr>
<tr>
<td>Art 130, 230</td>
<td>Drawing I, II</td>
<td>(6)</td>
</tr>
<tr>
<td>Art 122, 124</td>
<td>Two-Dimensional Design; and Three-Dimensional Design</td>
<td>(6)</td>
</tr>
<tr>
<td>Art 210</td>
<td>History of Art</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 211</td>
<td>History of Art</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Plus at least 9 credits in the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art 200, 201</td>
<td>Sculpture I, II</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 204, 205</td>
<td>Jewellerymaking I, II</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 220, 221</td>
<td>Painting I, II</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 231, 322</td>
<td>Figure Drawing I, II</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 240</td>
<td>Printmaking II, Intaglio</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 241</td>
<td>Printmaking I, Relief and Serigraphy</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 250</td>
<td>Ceramics I</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 253</td>
<td>Ceramics II, Throwing</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 260</td>
<td>Slide Photography</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 261</td>
<td>Color Printing</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 274</td>
<td>Calligraphy</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 276</td>
<td>Surface Design on Fabric</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 277</td>
<td>Fibers I</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Plus a MINIMUM of 20 credits in courses selected from the following list:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art 302</td>
<td>Sculpture III, IV</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 304</td>
<td>Jewelry &amp; Small</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 322, 323</td>
<td>Painting III, IV</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 332, 333</td>
<td>Figure Drawing III, IV</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 340</td>
<td>Printmaking III, Intaglio</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 341</td>
<td>Printmaking III, Plate &amp; Color Lithography</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 342, 343</td>
<td>Printmaking II, III, Intaglio</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 344, 345</td>
<td>Printmaking II, III, Intaglio</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 351</td>
<td>Ceramics II, Sculpture</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 353</td>
<td>Ceramics II, Throwing</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 355</td>
<td>Clay &amp; Glazes</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 361</td>
<td>Concepts in Visual Arts Education</td>
<td>(2)</td>
</tr>
<tr>
<td>Art 365, 366</td>
<td>Photography Studio I, II</td>
<td>(3, 3)</td>
</tr>
<tr>
<td>Art 371, 372, 373</td>
<td>Fibers II, III, IV</td>
<td>(3, 3, 3)</td>
</tr>
<tr>
<td>Art 375</td>
<td>Brush Lettering &amp; Sign Painting</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 379</td>
<td>Color Theory</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 391A, 391B</td>
<td>Special Topics</td>
<td>(1-4)</td>
</tr>
<tr>
<td>Art 410</td>
<td>Art History: Selected Topics</td>
<td>(1-4)</td>
</tr>
<tr>
<td>Art 412</td>
<td>Art History: 20th Century to 1930s</td>
<td>(3)</td>
</tr>
<tr>
<td>Art 490</td>
<td>Special Projects/Independent Research (variable credit—dependent upon scope of project)</td>
<td>(1-12)</td>
</tr>
</tbody>
</table>

Middle Level Education

B.S. ED. WITH MAJOR IN MIDDLE LEVEL EDUCATION

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

I. General Education Requirements (see University GER listing).

II. EHD General Graduation Requirements (see EHD listing).

III. Elementary Education Curriculum (see Elementary Education listing).

IV. The Following Middle Level Education (Grades 5-8) Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 341</td>
<td>Foundations of Middle Level Education</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of Young Adolescents</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 390</td>
<td>Technology for Teachers</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 409</td>
<td>Reading in the Content Areas</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 465</td>
<td>Middle Level Curriculum and Methods</td>
<td>(5)</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>(1)</td>
</tr>
</tbody>
</table>

V. Subject Matter Areas of Concentration

Students must select a minimum of 40 credits of work in two subject areas that are normally included in the Middle Level curriculum (e.g. science, mathematics, physical education). The 40 hours must include at least 18 in each area of concentration. One-half of the credits in each area must be numbered at or above the 200 level except in science, where exceptions may be made. Middle level advisers have lists of courses that may be recommended or required in certain areas.

In this combined major program, courses in Middle Level Education fulfill elective requirements in Elementary Education. It is recommended that students complete eight weeks of student teaching in an elementary school and eight in a middle school setting.

B.S. ED. WITH MAJOR IN MIDDLE LEVEL EDUCATION

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

I. General Education Requirements (see University GER listing).

II. EHD General Graduation Requirements (see EHD listing).

III. The Following Middle Level Education (Grades 5-8) Curriculum:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 200</td>
<td>Exploring Teaching</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 286</td>
<td>Field Experience (co-requisite)</td>
<td>(1)</td>
</tr>
<tr>
<td>T&amp;L 330</td>
<td>Introduction to Teaching and Learning</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 315</td>
<td>Education of the Exceptional Student</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Admission to teacher education is required for enrollment in all of the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 341</td>
<td>Foundations of Middle Level Education</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of Young Adolescents</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 390</td>
<td>Technology for Teachers</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 409</td>
<td>Reading in the Content Areas</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 432</td>
<td>Classroom Management</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 465</td>
<td>Middle Level Curriculum and Methods</td>
<td>(5)</td>
</tr>
<tr>
<td>T&amp;L 486</td>
<td>Field Experience</td>
<td>(1)</td>
</tr>
</tbody>
</table>

A minimum of two methods courses in each area of concentration (see below) from the secondary education program and co-requisite field experience are required.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 487</td>
<td>Student Teaching</td>
<td>(16)</td>
</tr>
</tbody>
</table>

IV. Subject Matter Areas of Concentration

Students must select a minimum of 40 credits of work in two subject areas that are normally included in the Middle Level curriculum (e.g. science, mathematics, physical education). The 40 hours must include at least 18 in each area of concentration. One-half of the credits in each area must be numbered at or above the 200 level except in science, where exceptions may be made. Middle level advisers have lists of courses that may be recommended or required in certain areas.

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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 315</td>
<td>Education of the Exceptional Student</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 341</td>
<td>Foundations of Middle Level Education</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 350</td>
<td>Development and Education of Young Adolescents</td>
<td>(3)</td>
</tr>
<tr>
<td>T&amp;L 390</td>
<td>Technology for Teachers</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 409</td>
<td>Reading in the Content Areas</td>
<td>(2)</td>
</tr>
<tr>
<td>T&amp;L 433</td>
<td>Multicultural Education</td>
<td>(3)</td>
</tr>
</tbody>
</table>
Secondary Education

Secondary Education Certification Preparation Sequence

Course Sequence (29 credits minimum):

Pre-admission:

T&L 200 Exploring Teaching .........................................................(2)
T&L 286 Field Experience ..........................................................(1)

Admission to Teacher Education is required for enrollment in all of the following courses:

T&L 300 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)
T&L 400 Methods and Materials ..................................................(3)
T&L 433 Multicultural Education ..................................................(3)
(T&L 412) Course to be completed in Indiana .........................(3)
T&L 460 Microteaching ...............................................................(2)
T&L 486 Field Experiences ..........................................................(1)
* T&L 495 Independent Study/Secondary Education .....................(1-2)
** T&L 487 Student Teaching ........................................................(16)
*** T&L 488 Senior Seminar .........................................................(1)

*Optional

**To be accepted for student teaching, applicants must have a 2.75 GPA in their major and a 2.50 GPA overall in all course work completed up to the time of application. Majors that require varied professional experiences complete 10 credits of student teaching. Students may enroll in several student teaching experiences to total 16 credits.

***Students enrolled in a discipline specific Senior Seminar need not enroll in T&L 488.

B.S.Ed. WITH MAJOR IN 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. EHD General Graduation Requirements (see EHD listing).

III. The Following Science Curriculum:

Biol 150, 151 General Biology I & II .............................................(6)
Chem 121/121L General Chemistry I and Laboratory ..................(2)
Chem 122/122L General Chemistry II and Laboratory ...............(8)
Chem 333 Introduction to Environmental, Clinical & Forensic Analysis ..........................................................(4)
Math 165, 166 Calculus I and II ......................................................(8)
Phys 251, 251L University Physics I and II Laboratories (Physics and Chemistry Emphasis) ...........................................(8)
or
Phys 212/212L University Physics I and II Laboratories (Biological Emphasis) .................................................(8)
Geog 121, 121L Physical Geography and Laboratory .................(4)
Geog 134, 134L Introduction to Global Climate and Laboratory ......(4)
Geol 101, 101L Introduction to Geology and Laboratory .............(4)
Geol 102, 102L The Earth Through Time and Laboratory ............(4)
Phys 223, 223L Introduction to Astronomy and Laboratory ..........(4)

3-4 hours from the following:

Biol 341 Cell Biology .................................................................(3)
Biol 357 Genetics ........................................................................(3)
Biol 442 Physiology of Organ & Systems .....................................(4)

3-4 hours from the following:

Biol 332/332L General Ecology and Laboratory .......................(4)
Biol 336 Systematic Botany ..........................................................(4)
Biol 363 Entomology .................................................................(4)
Biol 370 Vertebrate Zoology ..........................................................(3)

Students are strongly encouraged to get a minor in biology, chemistry, or physics when the B.S.Ed. in Science is their degree program.

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:

Anth 100 Introduction to Anthropology ......................................(3)
OR
Anth 171 Introduction to Cultural Anthropology .........................(3)
OR
Anth 172 Introduction to Archaeology and World Prehistory ......(3)

Anth elective 300 level or above ...................................................(3)
Econ 105 Elements of Economics ...............................................(3)
Econ 420 Economic Education ....................................................(3)

OR
Econ 330 Business and Economic History ....................................(3)
Geog 161 World Regional Geography ...........................................(3)
Geog 262 Geography of North America ......................................(3)
Geog 419 Methods and Materials in Geographic Education ..............(3)

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)
Psy 111 Introduction to Psychology ..............................................(3)
Psy 360 Introduction to Personality ...............................................(3)
Soc 110 Introduction to Sociology ...............................................(3)
Soc 301 Basic Sociology Theory .................................................(3)

Choice of one:
Pols 305 American Constitution—Governmental Powers ............(3)
Pols 306 American Constitution—Civil Liberties .....................................(3)
Pols 318 American Political Thought ............................................(3)

Choice of one:
Econ 210 Intro to Business and Economic Statistics ...................(3)
Geog 377 Quantitative Applications in Geoglab ...........................(3)
Psy 241 Introduction to Statistics ...................................................(4)
Soc 326 Sociological Statistics ....................................................(3)

Special Education

MINOR IN SPECIAL EDUCATION (20 CREDITS) OR AREA OF CONCENTRATION (15 CREDITS)

The following four courses are required for an Area of Concentration or Minor and should come before any subsequent courses:

* T&L 315 Education of the Exceptional Student ..............................(3)
* T&L 316 Introduction to the Emotionally Disturbed Child ............(2)
* T&L 317 Introduction to Mentally Retarded .........................(2)
* T&L 317s Introduction to Learning Disabilities .........................(2)

For the Minor a minimum of 11 credits may be taken from several groups of courses which are described in detail in the Special Education Adviser materials available in the Special Education Office, Room 303, Education Building. In order to obtain teaching credentials in special education, students will need to complete additional coursework. Detailed descriptions of all programs and courses leading to the credentials, including prerequisites and course sequences are available in the Special Education Office, Room 303, Education Building.

Courses

200. Exploring Teaching. 2 credits. Prerequisite: sophomore standing. Co-requisite: T&L 286. An opportunity for those considering becoming a secondary or middle level teacher to reflect on the foundations of education while examining his or her assumptions about teaching and schooling. This course is organized around three questions: What does it mean to teach? What do we need to know? and, What do students learn in school? In order to clarify and test the seriousness of a commitment to prepare for teaching, enrollment in a one-credit field experience is required. F,S

252. Child Development. 3 credits. Study of the growth and developmental process through adolescence. A basis for understanding basic needs of the normal child and means of meeting them in the child’s home and community environment. F,S

286. Field Experience. 1 credit. Co-requisite: T&L 200. Supervised tutorial or apprentice teaching experience in an early childhood, K-12 classroom, university or community setting approved by the program area. SU or grading. F,S

300. Curriculum Development and Instruction. 3 credits. Prerequisites: T&L 200, 206, and admission to teacher education. A general curriculum development and instruction course designed for the undergraduate pre-service teacher. It will focus on acquainting, the undergraduate with (1) an operating philosophy and its effects on teaching, (2) curriculum, (3) curriculum development, (4) instruction, and (5) instructional planning. The functions of thoughtful planning and evaluation in effective teaching will be emphasized. F,S
310. Introduction to Early Childhood Education. 3 credits. Corequisite: T&L 486. An overview of the early childhood education field, including an introduction to its historical roots; current theories, program models and issues; curriculum development; and typical strategies and development of young children. F,S

311. Observation and Description of Young Children. 3 credits. This course acquaints the student with a variety of ways of observing, recording, and analyzing the behavior and development of young children. The course will focus on such things as naturalistic observations, what can be learned from the language of children and what can be learned from art of young children. F,S

313. Young Children’s Language and Thought. 3 credits. This course examines both typical and atypical development of language and thought in children 0-8 as a basis for understanding and working with young children in educational settings. 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

316. Introduction to the Emotionally Disturbed Child. 2 credits. A survey of prevalent classroom behaviors which might indicate emotional disturbance. Current classroom approaches to the needs of the disturbed child will be explored. F,S

317. Education of Mentally Handicapped Students. 3 credits. Methods and programs for students who have handicaps will be explored. F,S

318. Introduction to Learning Disabilities. 2 credits. An introductory course dealing with the etiology and characteristics affecting individuals with learning disabilities. The various instructional approaches and service delivery models will also be explored. F,S

328. Survey of Children’s Literature. 3 credits. Students survey the broad range of literature written for children. Emphasis is placed on gaining familiarity with multicultural literature, understanding the distinguishing characteristics of genre, developing visual literacy with respect to picture books, evaluating the quality of literature for children, and how an individual’s development affects interest and use of literature. Investigating internet and traditional library resources support student ‘learning course content. 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. An introduction 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 videos 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. This foundational course explores the developmental nature of literacy learning, the reading and writing processes, and the conditions for successful literacy learning. Holistic methods for assessing language development are studied to understand individual language learners. F,S

341. Foundations of Middle Level Education. 2 credits. Prerequisite: Admission to Teacher Education. This course promotes understanding the needs of early adolescent students and of the interdisciplinary, collaborative teaching approaches associated with the middle school philosophy. The course addresses the components of organization. F,S

350. Development and Education of the Adolescent. 3 credits. Prerequisites T&L 200. Critical analysis of adolescent development education. A comprehensive examination of the characteristics and behavior of the early adolescent student with implications for curricul- um and instruction in the junior high and high schools. Topics covered will be transition from childhood to adolescence, including cognitive development, self-concept, physiological changes, social needs and values, and values and attitudes of adolescents. This course will provide an understanding of the wide range of differences in developmental patterns of children and the influences of economic, sociological and psychological factors in development. F,S

386. Field Experience. 1 credit. Prerequisites: T&L 200, 286. Supervised tutorial or apprentice teaching, experience in an early childhood, K-12 classroom, university or community setting approved by the program area. Optional S/U grading. F,S

390. Special Topics. 1-3 credits. May be repeated. "Other approved courses may meet this requirement. Prerequisites: T&L 200, T&L 286, and admission to teacher education. F,S

400. Methods and Materials. 3 credits. Prerequisite: Admission to the profession- al program. Corequisite: T&L 486. Various teaching methods and strategies and the materials used in teaching a subject area. Some offered F only; some S/F grading. 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.

409. Reading in the Content Areas. 2 credits. This course addresses issues of using text, expository and narrative, within the content areas (i.e., science, social studies). Writing and integration within and across the curriculum of the elementary class- room are investigated. F,S

410. Teaching Reading and Writing in the Elementary School (TEAM). 3 credits. Prerequisites: Admission to Teacher Education, T&L 335, 328 or 329. Corequisite: T&L 440, 470, 486. This course students learn how to test, assess reading and writing in the elementary school classroom. They learn program approaches, assessment, and instructional practices that are child centered, process oriented and literature based. F,S

411. Primary Reading and Language Arts. 2 credits. Prerequisites: Admission to Teacher Education, T&L 335. This course explores a wide variety of instructional practices for involving primary level children (grades P-3) in experiencing their lan- guage. The course emphasizes integrating reading, writing, speaking and listening with content areas and as forms of creative, personal expression. F,S

412. Intermediate Language Arts. 2 credits. Prerequisites: Admission to Teacher Education, T&L 335 and T&L 328 or T&L 329. This course explores a wide variety of instructional practices of involving intermediate level children (grades 3-6) in experienc- ing their language. The course emphasizes integrating reading, writing, speaking and lis- tening with content areas and as forms of creative, personal expression. F,S

413. Assessing and Correcting Reading Difficulties. 2 credits. Prerequisite: Admission to Teacher Education, T&L 335. The Corrective Reading Practicum (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 having difficulty with reading and writing. Observation, misuse analysis, interviews, and other holistic evaluation procedures are used to learn about reader and writers, and these assessments are used to plan for instruction. F,S,S

414. Corrective Reading Practicum. 2 credits. Prerequisite: Admission to Teacher Education, T&L 335. Corequisite to T&L 413. This is the practicum for Corrective Reading. The students plan for and teach children who are having difficulty with reading and/or writing. Observation, misuse analysis, interviews, and other holistic evaluation procedures are used to learn about reader and writers, and these assessments are used to plan for instruction. F,S,S

415. Reading and Writing Development of Bilingual Second Language Learners. 2 credits. This course is particularly interested in Native Americans of North Dakota. F,S

420. Transition to Adult Life. 2 credits. Systematic methods and curriculum which encourage successful adult life in persons with disabilities. Subject matter includes interagency cooperation and transition program development, career development, and the operation of cooperating agencies and programs. Special assessment and teaching methods from the vocational domain are covered. S

422. Development of the Gifted and Talented. 2 credits. Research and theory for understanding the development needs of the more able child in early childhood and in educational experiences. S

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 alter- natives based on continuous measurement data. F,S

428. Assistive Technology. 1 credit. An overview of the various forms of technol- ogy (e.g., communication boards, switches, software) that may be used to assist students with disabilities. F,S,S

430. Social Studies in the Elementary School (TEAM). 3 credits. Prerequisites: Admission to Teacher Education; grade of C or better in the following courses: T&L 330, 315, 328 or 329, 335 and Math 277; and GPA of 2.75 or better in the Elementary Education major. To understand and analyze the different modes of teaching social stud- ies, 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 preferential perspective on the ideal nature of Social Studies education. F,S

431. Teaching Hispanic Children. 2 credits. Hispanics generally, and Mexican Americans in particular, are the fastest growing segment of our population. Unfortunately, many people have limited knowledge of the rich history, culture(s), and educational needs of Hispanics. The purpose of this class is to introduce future teachers to this exciting group. S

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 may be used in planning for effective 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 devel- op their own eclectic style during the course of this class. F,S,S

433. Multicultural Education. 3 credits. Prerequisite: Admission to Teacher Education. This class takes an anthropological view of multicultural education. It will help students better understand students in culturally diverse classrooms both 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,S

434. How Children Learn. 3 credits. How Children Learn is designed to investi- gate 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 variables that affect learning. The focus is on the understanding, meaning, and experiences involved in growth, teaching, and learn- ing. S

435. 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 conference, home visits, parent programs, and resources for parents.

440. Math in the Elementary School (TEAM). 3 credits. Prerequisites: Admission to Teacher Education, Math 277, Math 103 or equivalent, or higher level math course, or score high enough on the CLEPUtject exam, or a score on the PPT indicating placement in Trigonometry or higher math. 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 mathe- matics in a constructivist environment by using the principles of manipulation, visualization, 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

University of North Dakota
443. Math for Primary Grades. 2 credits. Math for Primary Grades is an elective course that focuses on curriculum and methods for teaching mathematics in kindergarten through the third grade. Topics for teaching mathematics include: planning and organizing a developmentally appropriate classroom; teaching in a language-rich environment; incorporating children’s literature, poetry, and songs; facilitating communication through talking, listening, and writing; supporting children’sauthoring of ideas; and encouraging a thinking environment where children view themselves as mathematicians. S

444. Math for Intermediate Grades. 2 credits. Math for Intermediate Grades is an elective course that focuses on curriculum and methods for teaching mathematics in grades four through six. The course focuses on teaching mathematics and understanding in a cooperative environment and involves participants in projects and activities that develop conceptual understanding. F

451. Methods and Materials: Pre-Kindergarten. 3 credits. Prerequisite: T&L 310. 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. F

452. Developing Personal Teaching Styles. 1 credit. Prerequisite: Departmental permission and T&L 451. Corequisite: T&L 487 and 456. A tutorial, taken in conjunction with pre-kindergarten student teaching, in which personal styles of teaching are identified and developed in a manner conducive to exemplary practice in early childhood educational settings. S-U grading only. F, S

453. Methods and Materials: Kindergarten. 2 credits. Prerequisite: T&L 310, 312, 313. Exploration of curriculum, methods, and materials for use in kindergarten settings. S

454. Organization and Leadership in Early Childhood Education. 2 credits. Prerequisite: Senior standing, graduate, or permission of the instructor. An investigation of patterns 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 building trends in preschool to lower elementary educational patterns in the state, region, and nation. S

455. Comparative Approaches to the Education of Young Children. 3 credits. Prerequisite: T&L 310 or permission of instructor. A theoretical comparative study of various approaches to the education of young children. An examination of how theory influences practice in a variety of early childhood education models, including the Bank street model, Headstart, open education, Montessori schools, behavioral analysis, Dator, Piagetian, Vygotskian, and Reggio Emilia approaches. S

456. Pre-Kindergarten Seminar. 2 credits. Prerequisite: T&L 451, departmental permission. Corequisite: T&L 487, 452. 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

457. Introduction to Early Childhood Family Education. 1 credit. This course provides a student with an introduction to the philosophy and practice of early childhood family education (ECFE) programs. The course material will help the student recognize the role of early childhood family education in the entire preschool to 12th grade educational continuum. The course provides students with an overview of the combined role of early childhood education and parent education in a public school setting. F, S, S

460. Microteaching. 2 credits. Prerequisites: T&L 200, 286, 300, 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, group interaction, videotaped presentation, portfolio evaluations and other activities. Students should take this course the semester before student teaching. F, S

465. Middle Level Curriculum and Methods. 5 credits. Prerequisite: T&L 341. Corequisite: T&L 486. 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 the content area knowledge necessary for promoting student learning and success in a middle school setting. S


471. Physical Science 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, S

472. Teaching Life Sciences in the Elementary School. 2 credits. Hands-on approach to learning basic biology topics such as cells, plants, animals, and ecosystems. Effective teaching strategies are also emphasized. F, S

473. ND: Environmental Earth Science Perspective. 2 credits. Hands-on approach to learning basic earth science environmental education topics such as erosion, plate tectonics, water quality, and pollution in general. Effective teaching strategies area also emphasized. F, S

486. Field Experience. 1-4 credits. (Repeatable to 16). Prerequisite: Permission of program chair. 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.

495. Independent Study. 1-8 credits, repeatable to 8. This course is designed for the interested student’s pursuit of an area of study not offered through regular courses. In addition, students can continue to pursue subject matter covered in courses in greater depth.

499. Special Projects. 1-8 credits. Course number reserved for committee approved proposals, independent study, special colloquia, or experimental courses.

Theatre Arts

Theatre Arts (Thea)

K. McLennan (Chair), Gillette, Cutler, Jacobs, and Williams

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 leads the student to an understanding of the creative process in the performance and the technical areas of the theatre arts.

The Department of Theatre Arts in the College of Arts and Sciences at the University of North Dakota is the only department in any institution of higher learning in the State of North Dakota which is dedicated exclusively to the arts discipline. A diversified faculty are personally involved in and teach the various areas of the theatre arts, i.e., playwriting, acting, voice, movement, directing, history, dramatic literature, technical theatre, costuming, set design, lighting, and make-up. The Department of Theatre Arts and its B.A. and pre-professional B.F.A. degrees in Theatre Arts (acting and design) are accredited by the National Association of Schools of Theatre.

The curriculum of the Department of Theatre Arts provides students with opportunities to pursue either of the undergraduate degrees of Bachelor of Fine Arts or Bachelor of Arts, as well as the Master of Arts degree at the graduate level. Major concentrations in most of the Theatre Arts areas stated in the preceding paragraph are available to candidates for any of the previously listed degrees, although the curriculum assures a well-rounded experience in the chosen discipline and the other fine arts. The Bachelor of Fine Arts is a pre-professional degree, and it requires a higher level of proficiency in theatrical production and is an appropriate preparation for students who desire theatrical careers.

The instructional program of the Department is integrated with the program productions of the Burtness Theatre which provide broad practical experience for the students in theatre arts. The Burtness Theatre produces four or five major productions during the academic year, generally including an opera or musical. Several experimental or workshop productions, with student directors and designers, are staged each year in the Studio Theatre.

The regular season of productions is designed to offer a series of contrasting literary and production styles, thereby challenging and enlightening both participants and audiences.

During the summer, the department sponsors “Shakespeare in My Park,” a company including faculty and students that tours a Shakespeare play to community parks throughout the region. The Department also sponsors a touring group called Suitcase Shakespeare, a company of student actors performing selected scenes and soliloquies for regional high schools. Stipends and academic credit are available for both “Shakespeare in My Park” and Suitcase Shakespeare.

The facilities of the Department of Theatre Arts in the Burtness Theatre and in adjacent Chandler Hall. In addition to the fully-equipped, 365
seat, proscenium-stage theatre in the Burnness facility, there are a set-
construction shop, costume shop, and the 180-seat Studio Theatre. The
Chandler Hall facilities include: a dance studio, classroom and rehearsal
spaces, a computer design studio and shops, and office and storage
spaces.

The Bachelor of Fine Arts program in Theatre Arts is offered to stu-
dents with marked abilities who desire an intensive undergraduate
concentration in Theatre Arts, in preparation for either a career in profes-
sional 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 to the chairperson who will then schedule an audition or port-
folio presentation and personal interview for the candidate with the
Theatre Arts faculty. BFA applications are generally accepted in
February with screening held in March. Upon acceptance, the student
will be assigned a faculty adviser. Each student will be reviewed annual-
ly by Theatre Arts faculty, which will make a recommendation concern-
ing the student’s status in the BFA program, based on the student’s per-
formance in classes and in production activities. If probation is recom-
manded, students may apply for readmission at the completion of a full
semester of satisfactory work. Readmission will be contingent upon fac-
culty evaluation.

As part of the department’s outcomes assessment plan, all Theatre
Arts majors are required to complete an exit interview, an attitudes sur-
vey 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. 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. The Following Curriculum:

A. Core I (courses normally taken during the first two years of study)
  Thea 122.............Makeup for Theatre and Television.........................(1)
  Thea 130.............The Art and Craft of Theatre.................................(3)
  Thea 161.............Acting I.................................................................(3)
  *Thea 201.............Theatre Practicum...............................................(3)
  Thea 226.............Intro to Design.....................................................(3)
  Thea 250.............Readings in Dramatic Literature............................(3)
  Thea 270.............Stagecraft.............................................................(3)
  *At least one credit of Thea 201 must be for technical theatre involvement.

B. Core II (courses normally taken during the last two years of study)
  Thea 300.............Play Direction I.....................................................(3)
  Engl 315 or 316........Shakespeare...................................................(3)
  Thea 423.............History of the Theatre: Classical, Medieval, Renaissance(3)
  Thea 424.............History of the Theatre: 17th Century to the Present.....(3)
  Music Courses in History/Theory.......................................................(3)
  Art Courses in History/Theory...........................................................(3)
  Music or Art Courses in Applied Art..................................................(3)
  Thea/Engl Additional courses in Dramatic Literature (may include Thea 330)....(6)

C. From one of the following tracks:

  1. Performance
     a. Required
        Thea 140/140L....Stage Movement and Laboratory...........................(2)
        Thea 180, 280, 380, 480.........................................................(8)
        Thea 261.............Acting II.......................................................(3)
        Thea 314.............Vocal Performance Techniques...........................(3)
        Thea 402.............Acting III....................................................(3)
        Thea 481.............Theatre Practicum..........................................(3)

     b. Electives*
        Thea 222.............Advanced Makeup...........................................(1)
        Thea 229.............Creative Dramatics.........................................(3)
        Thea 329.............Children’s Theatre...........................................(3)
        Thea 329.............Production Design..........................................(3)
        Thea 404.............Acting for the Music Theatre............................(3)

  2. Design and Technical Theatre
     a. Required
        Thea 326.............Lighting for Stage I.........................................(2)
        Thea 339.............Production Design..........................................(3)
        Thea 426.............Scene Design for the Stage...............................(3)
        Thea 427.............Costume Design.............................................(3)
        Thea 481.............Theatre Practicum..........................................(7)
        Thea 494.............Senior Project................................................(4)

     b. Electives*
        Thea 426.............Scene Design for the Stage................................(3)
        Thea 427.............Costume Design.............................................(3)
        Thea 336.............Lighting for Stage II.......................................(2)
        Thea 426.............Scene Design for Stage....................................(3)
        Thea 427.............Costume Design.............................................(3)

     *Courses to be approved by adviser

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
    topics include: Women’s Studies, Minority Studies, Anthropology, English,
    Psychology, Computer Science, Indian Studies, Peace Studies, Music, Com-
    munication, Visual Arts, etc.)

IV. The following curriculum:

    33 credits, including
    Thea 130.............The Art and Craft of Theatre................................(3)
    Thea 161.............Acting I...............................................................(3)
    Thea 201.............Theatre Practicum...............................................(2)
    Thea 226.............Intro to Design.....................................................(3)
    Thea 250.............Readings in Dramatic Literature............................(3)
    Thea 270.............Stagecraft.............................................................(3)
    Thea 300.............Play Direction I.....................................................(3)
    Thea 330.............Contemporary Theatre..........................................(3)
    Thea 423.............History of Theatre: Classical Medieval & Renaissance.(3)
    Thea 424.............History of Theatre: 17th Century to the Present........(3)

    4 hours from the following:
    Thea 122.............Makeup for Theatre and Television.........................(1)
    Thea 222.............Advanced Makeup.............................................(1)
    Thea 223.............Beginning Oral Interpretation...............................(3)
    Thea 229.............Creative Dramatics.............................................(3)
    Thea 261.............Acting II...............................................................(3)
    Thea 325.............Scene Craft...........................................................(3)
    Thea 326.............Lighting for Stage I.............................................(2)
    Thea 329.............Children’s Theatre.............................................(3)
    Thea 425.............Play Direction II...................................................(3)
    Thea 426.............Scene Design for Stage........................................(3)
    Thea 427.............Costume Design.................................................(3)
    Thea 481.............Theatre Practicum...............................................(1)
    Thea 488.............Playwriting...........................................................(3)

MINOR IN THEATRE ARTS

Required 23 credits, including:

    Thea 130.............The Art and Craft of Theatre................................(3)
    Thea 161.............Acting I...............................................................(3)
    Thea 201.............Theatre Practicum...............................................(1)
    Thea 270.............Stagecraft.............................................................(3)
    Thea 300.............Play Direction I.....................................................(3)

    3 hours from the following:
    Thea 423.............History of Theatre................................................(3)
    Thea 424.............History of Theatre................................................(3)

    3 hours from the following:
    Thea 250.............Readings in Dramatic Literature...........................(3)
    Thea 330.............Contemporary Theatre..........................................(3)

    Courses from the following to total 23 hours:
    Thea 122.............Makeup of Theatre & Television...........................(1)
Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thea 130</td>
<td>Introduction to Theatre Arts (CCN)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Thea 130L</td>
<td>Acting I (CCN)</td>
<td>3</td>
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<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>Thea 131</td>
<td>Acting II</td>
<td>3</td>
<td>Thea 130, 130L</td>
</tr>
<tr>
<td>Thea 132</td>
<td>Stage Movement</td>
<td>2</td>
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<tr>
<td>Thea 133</td>
<td>Lighting for Stage I</td>
<td>3</td>
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<tr>
<td>Thea 134</td>
<td>Scene Design for Stage</td>
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<tr>
<td>Thea 135</td>
<td>Design for the Stage</td>
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<tr>
<td>Thea 136</td>
<td>Contemporary Theatre</td>
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<tr>
<td>Thea 137</td>
<td>Contemporary Theatre</td>
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<td>Thea 138</td>
<td>Stage Movement</td>
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<tr>
<td>Thea 139</td>
<td>Lighting for Stage I</td>
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<td></td>
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<tr>
<td>Thea 140</td>
<td>Stage Movement</td>
<td>2</td>
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<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>Thea 130</td>
<td>Introduction to Theatre Arts (CCN)</td>
<td>3</td>
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<tr>
<td>Thea 130L</td>
<td>Acting I (CCN)</td>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>Thea 131</td>
<td>Acting II</td>
<td>3</td>
<td>Thea 130, 130L</td>
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<td>Thea 132</td>
<td>Stage Movement</td>
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<td>Thea 133</td>
<td>Lighting for Stage I</td>
<td>3</td>
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<td>Thea 134</td>
<td>Scene Design for Stage</td>
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<td>Thea 135</td>
<td>Design for the Stage</td>
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<td>Thea 136</td>
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<tr>
<td>Thea 137</td>
<td>Contemporary Theatre</td>
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<tr>
<td>Thea 138</td>
<td>Stage Movement</td>
<td>2</td>
<td></td>
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<tr>
<td>Thea 139</td>
<td>Lighting for Stage I</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Thea 140</td>
<td>Stage Movement</td>
<td>2</td>
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</tr>
</tbody>
</table>

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.
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..............................(1-3)
IDS 499............................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, 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 and 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 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)

Students may declare a minor through the College of Arts and Sciences and should also contact the Director of Women Studies and one other member of the Women Studies faculty to design a program of study.
Graduate Academic Information

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(Also see the Index beginning on page 262 of this Catalog to find the location of more specific subject matter than is listed in this contents.)
The
GRADUATE SCHOOL
Joseph N. Benoit, Dean

MISSION

The Graduate School has responsibility for all graduate work at the University. It is the purpose of this 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 (about 1,500 students) and most diversified (49 programs) graduate program in the region. A number of unique facilities and support resources augment the instructional and research program.

Each year approximately 500 new students enroll for degrees in the Graduate School, and approximately 400 students receive master’s degrees and 50 students receive doctoral degrees. In addition, the Graduate School and the Division of Continuing Education offer an extensive program of off-campus graduate work.

DEGREES GRANTED

The degrees conferred for graduate work are the Master of Arts, Master of Science, Master of Education, Master of Business Administration, Master of Engineering, Master of Fine Arts, Master of Music, Master of Physical Therapy, Master of Public Administration, Master of Social Work, Doctor of Arts, Doctor of Education and Doctor of Philosophy. The Specialist Diploma is offered in Educational Leadership.

GRADUATE PROGRAMS

The University offers work leading to the doctorate in 18 fields. Forty-six programs 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 and to the Graduate School Section of this Catalog. Courses with 500 series numbers are graduate courses and are normally open only to graduate students. 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.

For a listing of the fields in which graduate degrees may be obtained, see the table below.

ADDITIONAL INFORMATION

For detailed information students should consult the Graduate School Section of this Catalog or address inquiries to the Dean of the Graduate School, Box 8178, University of North Dakota, Grand Forks, ND 58202; Telephone (701) 777-2784.

GRADUATE PROGRAMS AND DEGREES

<table>
<thead>
<tr>
<th>Program</th>
<th>Degrees Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy and Cell Biology</td>
<td>MS, Ph.D., MFA&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Art</td>
<td>MS</td>
</tr>
<tr>
<td>Atmospheric Sciences</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Aviation</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Biochemistry and Molecular Biology</td>
<td>MS, Ph.D.</td>
</tr>
<tr>
<td>Biology</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, Ph.D.</td>
</tr>
<tr>
<td>Business Administration</td>
<td>MBA&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Career and Technical Education</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Engr&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chemistry</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, Ph.D.</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>M.Engr&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Clinical Laboratory Science</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Communication</td>
<td>MA&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Communication Sciences and Disorders</td>
<td></td>
</tr>
<tr>
<td>(See Speech-Language Pathology and Speech and Hearing Sciences)</td>
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</tr>
<tr>
<td>Computer Science</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Counseling</td>
<td>MA&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Counseling Psychology</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Early Childhood Education</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Educational Leadership</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Ed&lt;sup&gt;1&lt;/sup&gt;, Spec. Dip., Ed.D., Ph.D.</td>
</tr>
<tr>
<td>Education — General Studies</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Educational Leadership</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Ed&lt;sup&gt;1&lt;/sup&gt;, Spec. Dip., Ed.D., Ph.D.</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Engr&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Elementary Education</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Ed&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Energy Engineering</td>
<td>Ph.D.</td>
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<tr>
<td>English Language and Literature</td>
<td>MA, Ph.D.</td>
</tr>
<tr>
<td>Geography</td>
<td>MA&lt;sup&gt;1&lt;/sup&gt;, MS&lt;sup&gt;1&lt;/sup&gt;, M.Ed&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Geology</td>
<td>MA, MS, Ph.D.&lt;sup&gt;1&lt;/sup&gt;</td>
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<td>History</td>
<td>MA, DA</td>
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<tr>
<td>Industrial Technology</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
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<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Ed.</td>
</tr>
<tr>
<td>Kinesiology</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Linguistics</td>
<td>MA</td>
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<tr>
<td>Mathematics</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Ed&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Mechanical Engineering</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Engr&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Microbiology and Immunology</td>
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<tr>
<td>Music</td>
<td>MA&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Nursing</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pharmacology and Toxicology</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, Ph.D.</td>
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<tr>
<td>Physical Therapy</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Engr&lt;sup&gt;1&lt;/sup&gt;</td>
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<td>MS, Ph.D.</td>
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<td>Psychology</td>
<td>MA, Ph.D.</td>
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<tr>
<td>Public Administration</td>
<td>MPA&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Reading Education</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Ed&lt;sup&gt;1&lt;/sup&gt;</td>
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<td>Secondary Education (see Education-General Studies)</td>
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<tr>
<td>Social Work</td>
<td>MSW&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Sociology</td>
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<tr>
<td>Space Studies</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Special Education</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;, M.Ed&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Speech and Hearing Science</td>
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<tr>
<td>Speech-Language Pathology</td>
<td>MS&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Teaching and Learning</td>
<td>Ed.D., Ph.D.</td>
</tr>
<tr>
<td>Theatre Arts</td>
<td>MA</td>
</tr>
<tr>
<td>Visual Arts (see Art)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> Non-thesis option is available.

<sup>2</sup> Non-thesis degree only.
The Graduate School

STUDENT 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 THE STUDENT IS PURSUING. 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 acquire and read the guide to writing a thesis or dissertation. The student is responsible for ascertaining 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.

IGNORANCE OF A RULE DOES NOT CONSTITUTE A BASIS FOR WAIVING THAT RULE.

THE GRADUATE SCHOOL

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 under the joint supervision of the Graduate School and the Division of Continuing Education. A number of degree programs are offered throughout the state of North Dakota.

The first master’s degree was awarded in 1895, and the first Ph.D. was awarded in 1914. In 2000, 402 master’s degrees, 1 specialist diploma, and 31 doctorates were awarded. More than 14,000 master’s degrees, 85 specialist diplomas, and 1780 doctoral degrees have been awarded by the University.

The Graduate School is a member of the Midwest Association of Graduate Schools and the Western Association of Graduate Schools. It 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 400 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 and twelve elected members, one representative elected from and by the graduate faculties of nine academic area electorates, and three members elected at large from the Graduate Faculty. 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.

THE GRADUATE COMMITTEE

Joseph N. Benoit, Ph.D. (ex-officio)
Sharon Carson, Ph.D., Member-at-Large, 1998-2001
Kathleen McLennan, Ph.D., Fine Arts, 2000-2003
Barry Milavetz, Ph.D., Health Sciences, 1999-2002
Richard Millspaugh, Ph.D. (Chair), Science/Mathematics, 1998-2001
Jim Mochoruk, Ph.D., Humanities, 1998-2001
David Perry, Ph.D., Human Resources, 1999-2002
Richard Schultz, Ph.D., Engineering, 1998-2001
Paul Todhunter, Ph.D., Social Sciences, 2000-2003
John Wagner, Ph.D., Member-at-Large, 2002-2003
Jake Wambganss, Ph.D., Business, 1999-2002
Tom Wiggen, Ph.D., Business, 1999-2002

RESEARCH AND SCHOLARSHIP AT UND

The faculty at the University of North Dakota are committed to the development of new knowledge and technology through research, scholarships, and creative activities. Large numbers of high quality creative efforts include publications, presentations, books, exhibitions, and contracts 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 Energy and Environmental Research Center (EERC), the Bureau of Business and Economic Research, the Bureau of Governmental Affairs, the Bureau of Educational Services, the Center for Innovation, the Center for Rural Health, the Institute for Ecological Studies, the Institute for Remote Sensing, the Social Science Research Institute, and the Engineering Experiment Station. 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.

UND and NDSU are also active in the North Dakota Experimental Program to Stimulate Competitive Research (EPSCOR). Since 1986 this program has obtained over $14 million from the NSF and stimulated submission of proposals far in excess of that value. EPSCOR money is expended to enhance research at UND and to build the science infrastructure in the state of North Dakota.

ASSESSMENT

As an institution of higher education, the university is committed to ongoing assessment of student learning at all levels and in all programs. Assessment of student learning is essential in order for the university to improve educational programs and the experiences of students. Students 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.
Admission

APPLICATION

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.

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
P.O. Box 8178
Grand Forks, ND 58202-8178
Phone (701) 777-2947 1-800-CALL UND
Fax (701) 777-3619
E-mail: undgrad@mail.und.nodak.edu
Worldwide Web: http://www.und.edu

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 following programs observe specific deadlines:

- Biology / February 15
- Counseling / February 1
- Counseling Psychology / January 1
- English / March 1
- Nursing–Anesthesia / December 15
- Nursing–Family Nurse Practitioner / January 15
- Psychology (all specialties) / February 1
- Social Work / January 10
- Speech-Language Pathology / February 15

NOTE: It is strongly recommended that you submit and complete your application at least two weeks prior to the departmental deadlines.

MINIMUM GENERAL 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-CHE, SACS-CC, or WACS-St.). 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 or a GPA of at least 3.00 for the junior and senior years of undergraduate work (based on A = 4.00). *(For applicants having the equivalent of one or more years of baccalaureate work reported on a non-graded system, submission of (a) an evaluation of the work and (b) Graduate Record Examination scores on the General Test and the Subject Test, if offered in the discipline.)

4. A minimum TOEFL (Test of English as a Foreign Language) score of 550 on the paper-based test or 213 on the computer-based test for all applicants whose native language is not English. Applicants who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

5. Completion of all departmental admission requirements (see the section entitled, “Departmental Programs,” pages 189-249.)

*Exception—Master of Engineering Program requires an overall GPA of 2.50.

REQUIREMENTS FOR ADMISSION TO SPECIALIST OR DOCTORAL PROGRAMS

1. All general admission requirements listed above.

2. A master’s degree from an accredited institution normally in the field of proposed specialist or doctoral study.

Note: With the approval of the University Graduate Committee, some departments permit admission to the doctoral program with a bachelor’s degree. See the departmental section for the specific requirements which may be in addition to the Minimum General Requirements listed above.

3. A Grade point Average of 3.5 or above in all graduate level work.

4. Completion of all departmental requirements.

Applicants who have received a master’s degree from the United States or English-speaking Canada are not required to submit the TOEFL.

Students who do not meet all of the above requirements for admission may be considered for PROVISIONAL admission or for QUALIFIED admission (see page 174).

Please see the Departmental Section for admission requirements in addition to the minimum Graduate School requirements.

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 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.

INTERNATIONAL STUDENTS

It is strongly recommended that the application be completed three months prior to the term in which the applicant wishes to matriculate.

All applicants whose native language is not English are required to demonstrate English language proficiency by taking the TOEFL (Test of English as a Foreign Language) and achieving a minimum score of 550 for the paper-based test or 213 for the computer-based test. Applicants who have received a bachelor’s degree or higher from the United States or English-speaking Canada are not required to submit the TOEFL.

Graduate assistantships are generally unavailable to international students during their first year of study. However, an applicant with an outstanding record may be considered only if he or she has first taken the Test of Spoken English and achieved a minimum score of 50.

International students are required to submit a certification of finances to the Graduate School after an offer of admission has been made. Approximately $19,000 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. All applicants are required to submit the following: 1) Application Form; 2) Application Fee; 3) Three letters of recommendation; 4) Two official copies of all academic transcripts; and 5) Statement of Purpose.

Certain graduate programs require additional materials as part of their application process (i.e., writing samples, test scores, portfolios,
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ect.). You should contact the department or the Graduate School for more specifics.

**CATEGORIES OF ADMISSION**

**Degree Status**

Applicants for degree programs may be admitted to Approved, Qualified, or Provisional Status.

**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 course work which must be completed by the end of the second registration. Upon completion of such work, 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.

**Provisional Status**

Admission to Provisional Status may be granted to an applicant who has not met one or more of the admission requirements (i.e., low GPA, low test scores, or inadequate writing skills). 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 12 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.

**Non-Degree Status**

Applicants who want to take graduate classes but who do not want to earn a degree are classified as Non-Degree students. All applicants 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.

**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 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 Non-Degree Students are not eligible for Deferred Admission status.

**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, 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.

**Academic Policies**

**REGISTRATION**

NOTE: Students attending North Dakota colleges and universities must prove immunization against measles, mumps, and rubella. This policy includes students taking courses offered for credit, non-credit, or audit. Forms to prove compliance are available at the UND Student Health Service, University of North Dakota, P. O. Box 9038, Grand Forks, ND 58203-9038, phone (701) 777-3963.

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 students, however. Registration and fee payment procedures are outlined by the Registrar’s Office and published in the Time Schedule. Registration is complete only upon payment of tuition and fees. Registration may be cancelled by the Bursar if tuition and fees are not paid.

It is strongly recommended that students consult their advisor before registering and check departmental and program policies on advisement.

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 on page 176.

The number of credits for which a student may register is subject to certain limits as defined on page 176. Registrations not in compliance with University, Graduate School, and departmental policies are subject to cancellation by the 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.
Continuing Enrollment—996

Students who previously have registered for all of the necessary credits of course work, research, 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 12 credits. Advisor verification of the appropriateness of the number of 996 credits may be required.

After two separate semesters of 6 to 12 hours in 996 for master’s students and after four separate semesters for doctoral students, a student wishing to enroll in additional 996 hours 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 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.

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 or a cognate area and must consist of at least 9 credit hours.

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 the courses approved for graduate credit may be included in a minor.

A cognate is a selection of courses providing broad support to the major. All courses number 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 of fields. A cognate area will not be titled and will not be listed on a student’s transcript.

NOTE: When a graduate student elects to use a 300- or 400-level course for graduate credit, it is understood that the student will be required to do additional work over and above that required of undergraduates. Usually, such work is of an independent nature.

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 Committee.

CERTIFICATE PROGRAMS

Some graduate programs offer certificate programs in addition to the degree programs. Certificate programs generally require a minimum of 9 credit hours of course work in approved graduate courses which are transferable to a graduate program. A minimum grade of C in each course is required to earn credit and the certificate.

Admission to the certificate program may be different from admission to a degree program. Please consult the department for specific requirements.

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 catalog.
- UND seniors who have obtained special permission as described in page 176 may also receive graduate credit for graduate courses.
- All courses listed in the “Departmental Program” section carry graduate credit and are eligible for use in the major or minor of any Program of Study for a graduate degree, subject to the approval of an advisor or Faculty Advisory Committee and the dean.
- All UND courses numbered 300 and above may be applied to the cognate part of a Program of Study.

(When a graduate student elects to use a 300- or 400-level course for graduate credit, it is understood that the student will be required to do additional work over and above that required of undergraduates. Usually, such work is of an independent nature.)
- 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 may not 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 may work for an advanced degree.

ELIGIBILITY OF FACULTY TO PURSUE GRADUATE DEGREE

A UND faculty member above the rank of instructor may be admitted to and enrolled in a graduate degree program at this University two years after the date of termination as a faculty member. In those instances where there is clearly no potential for serious conflict of roles or interests, the two-year interval may be waived by the University Graduate Committee upon the recommendation of the department to which admission is sought. This policy does not apply to members of the Department of Military Science.

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.

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 cir-
cumstance (such as grading, testing, 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 in which the course is offered. The process must commence with a discussion between the student and the instructor.

2. **Other 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., the director of graduate study or, in the absence of such a position, the department chairperson
   c. The dean of the Graduate School
   d. The Graduate Committee
   e. The Student Academic Standards Committee (as described in the Code of Student Life)

Grievances must be submitted in writing when advanced beyond the first discussion. Similarly, responses to such advanced grievances must be in writing. Responses by the parties described in items 2 and 3 shall be within 10 class days of their receipt; response by the Graduate Committee shall be within a reasonable period of time consistent with its meeting schedule.

**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.

**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 to take a graduate course.

A senior may be granted graduate credit for the courses listed in this section of the catalog if the student:

1. the credits sought will not be used to complete requirements for the baccalaureate degree.
2. secures the prior approval of the dean of the Graduate School on a form available from the Graduate School and does so no later than the last day to add a course.
3. is within twelve credits of the baccalaureate degree;
4. completes the degree requirements in the current semester;
5. has an overall GPA of at least 3.00;
6. is carrying a total academic load of no more than 16 credits during a semester or 8 credits during the summer session;

(7) is not taking the courses for S/U credit;

**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 twelve credit hours in a semester or nine credit hours in a summer session. A graduate student may carry no more than sixteen credit hours per semester or 9 credits in a summer session. Graduate research assistants whose research is part of their degree requirement must carry at least 12 credits each semester or 6 credits in a summer session. Graduate teaching or service assistants and some graduate research assistants must enroll in the following number of credits:

<table>
<thead>
<tr>
<th>Graduate Appointment</th>
<th>(minimum-maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester (16 weeks)</td>
<td>6-10</td>
</tr>
<tr>
<td>Summer (8 weeks)</td>
<td>3-5</td>
</tr>
</tbody>
</table>

**GRADING SYSTEM**

A graduate student will be allowed credit for a course only when a grade for the course has been reported to the Registrar’s Office. 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>
<tr>
<td>U</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>W</td>
<td>Withdrawn</td>
</tr>
</tbody>
</table>

**Graduate Grade Point Average**

A graduate student’s cumulative GPA is based on all course work, 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 Timetable of classes, 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.

**REMOVAL OF INCOMPLETE GRADES**

University policy specifies that the grade of Incomplete is to be given only when circumstances beyond the student’s control have prevented completion of the course within the official dates of the session, provided the work completed up to four weeks before the end of the semester was satisfactory. The grade of “I” is temporary and indicates that the student’s work must be made up and completed without repeating the course.

A graduate student who receives a grade of “Incomplete” is obligated to complete the necessary work and submit it to the instructor in a
timely manner in order that the “Incomplete” can be replaced by a permanent grade. The letter grade must be submitted to the Registrar by the date specified by the instructor on the Incomplete grade form or within the first five weeks of the beginning of the next regular semester, whichever date occurs first. If the Incomplete is not replaced before the deadline, it will be converted by the Registrar to the grade specified on the Incomplete grade form submitted by the instructor.

The grade of “Incomplete” received for registration in 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), activities which usually span several sessions, need not be replaced until the conclusion of the activity, usually a student’s final semester.

Students may not register in courses in which they currently hold grades of Incomplete. This rule does not apply to registration for Thesis, Dissertation, Research, or Engineering Research Design.

For students to remain on the graduation list for a given semester, Incompletes in all courses/seminars/practica, etc. must have been made up by the date designated in the academic calendar.

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.

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 12 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 graduate dean. Students having accumulated 12 or more credit hours will be placed on academic probation for one semester; students having accumulated fewer than 12 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) 12 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 7 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 8 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 (a) must devote full time to academic study and (b) must be registered for at least twelve credits in a semester or six credits in a summer session, or be a graduate teaching or research 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.

Off-campus graduate courses offered by the University of North Dakota through the Division of Continuing Education do not carry credit toward meeting the residence requirement.

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

Graduate courses more than seven years old are considered obsolete and may not be counted to fulfill course requirement for an advanced degree program. Programs of study more than seven years old also are obsolete.
Overage 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 overage 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. The prior approval of the dean must be obtained for the proposed revalidation procedure.

Graduate work from another institution which is overage may not be revalidated for a UND graduate degree. Work which was part of a completed prerequisite graduate degree program does not become overage.

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 and Program Development.

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, through the division of Continuing Education and Outreach Programs, offers master’s degrees and a Ph.D. degree 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 via the North Dakota Interactive Video Network (IVN) utilizing two-way compressed video and audio. Other delivery methods include video tape coupled with on-campus labs and/or capstone sessions, Internet, and onsite instruction. Degree programs currently being offered include:

- Master’s Degree in Public Administration delivered from Grand Forks to Bismarck via IVN.
- Master’s Degree in Business Administration delivered from Grand Forks to Bismarck and Dickinson via IVN.
- Master’s Degree in Space Studies offered on-site in Bismarck.
- Master of Science in Education–General Studies offered on-site in Bismarck.
- Master of Science in Elementary Education delivered from Grand Forks to Bismarck via IVN.
- Ph.D. in Teaching and Learning: Higher Education delivered from Grand Forks to Bismarck via IVN and on-site in Bismarck.
- Master of Education in Educational Leadership delivered from Grand Forks to Bismarck via IVN.
- Master of Education in Special Education delivered from Grand Forks to Bismarck via IVN.
- Master of Education in Elementary Education delivered from Grand Forks to Bismarck via IVN.
- Master of Science in Elementary Education delivered from Grand Forks to Bismarck via IVN.

Graduate courses are also offered in the area of Autistic Spectrum Disorders from Grand Forks to students throughout the United States and Internationally via video tape and the Internet. For more information on degree programs and/or courses offered at a distance, please call toll free 877-450-1842 or (701) 777-4883 or visit the web site at www.conted.und.edu.

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. Registration is limited to persons holding a minimum of a baccalaureate degree, and grading is on the Satisfactory/Unsatisfactory system. 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.

Correspondence Study

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 course work 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.
Financial Information

(See p. 6-9 for general information on tuition, fees, etc.)

GRADUATE SCHOOL AWARDS

Applications for Graduate Assistantships are accepted throughout the year; however, students are reminded that most appointments 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 attend the University until they have received the bachelor’s degree and fulfilled all requirements for admission to the Graduate School as a degree student.
2. Only Degree students in Approved 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.
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 withholding. Preference is given to residents of North Dakota and to students who have not previously held the scholarship. Scholarships for the Summer Session are available to those who held Graduate Teaching Assistantships during the preceding year. Students should contact their department chair/director to be nominated.

Cultural Diversity Tuition Waivers may be available. Applications are available in the Graduate School.

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.

Summer Doctoral Fellowships of $4,000 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 second 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 and a maximum of 10 credits of graduate work each semester. A quarter-time assistant receives 7/10 to 10 hours per week and must carry 8 to 12 credits per semester.

The tuition is waived by the University. Students are responsible for all other fees. Assistantships are available in most departments offering a graduate degree.

International teaching assistants who are non-native speakers of English are required to take the TSE (Test of Spoken English) and achieve a score of 50 before an assistantship may be offered.

Graduate Research Assistantships are offered in many of the departments of the University (e.g., science, engineering, and education). These appointments usually carry a monthly stipend. The tuition is waived by the University. Students are responsible for all other fees.

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. A half-time assistant must carry 6-10 credits and a quarter-time assistant must carry 8-12 credits per semester.

Graduate Service Assistantships are available for work in several units on campus, including the Division of Student Affairs, Computer Center, 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 usually are comparable to the stipends of graduate teaching assistants. Tuition and non-resident fees will be waived for these assistantships. Academic load requirements are the same as for teaching assistants.

Awards

Chester Fritz Scholarships of $1,000 each are awarded to North Dakota students with an outstanding academic record who are continuing graduate work.

K. B. Tiffany Scholarships of $1,000 is awarded to a student pursuing a graduate degree in English.

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.
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 (pages 189-249).

MASTER OF ARTS, MASTER OF SCIENCE

These degrees are available with a thesis option in most fields. A non-thesis option also 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. 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 for inclusion.

The program may include just the major, the major and a minor, or the major and a cognate area (see page 188 for information regarding minors and cognates). The major must include 20 credits from the major department, and a minor or cognate area must include at least 9 credits.

Students should refer to the section of this Catalog entitled “Departmental Programs” for the additional admission, degree, examination, and course requirements unique to each department.

Residence Requirement. A student must spend a minimum of one semester or two summer sessions in residence on this campus (see page 177 for a definition of Residence). 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 thesis. Note: The Residence Requirement is in effect unless modifications have been granted to the department by the Graduate Committee.

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 shall 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 accord 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. Copies also may be purchased at the University Bookstore.

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 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 (12 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 written recommendation of the chairperson, or designate, of the student’s major department and normally will consist of three members, but may consist of four. 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 designee, 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. 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. 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.

The program may include just the major, the major and a minor, or the major and a cognate area (see page 188 for information regarding minors and cognates). The major must include at least 22 credits from the major department and a minor or cognate area must include at least 9 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, 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 to the Registrar’s Office.

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 designee, 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 designee). If a minor is declared, the program also must be signed by the chairperson of the minor department. The Program of Study should be developed early in the second semester and submitted to the 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 a 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 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 sixteen 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. (See page 178 for further information.)

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 Registrar’s Office.

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 written recommendation of the chairperson of the student’s major department. 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, 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 Business Administration, Chemistry, Geology, and Public Administration. 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. Students interested in these programs need to refer to the individual departments for admission and program requirements.

INTEGRATED MASTER OF ENGINEERING PROGRAM

The Integrated Master of Engineering program provides an opportunity for selected students to work concurrently toward the Bachelor of Science in Engineering degree and the Master of Engineering degree. Such students will be able to complete both degrees in a total of five years and will be qualified to enter the engineering profession at an advanced level with special competence in engineering design.

Admission Requirements

Applicants will be considered for admission to the Integrated M. Engr. program if they have met the following requirements:

1. A minimum of 90 semester credits toward an engineering baccalaureate degree.
2. A minimum of 36 semester credits of approved engineering courses in the work completed.
3. Academic achievement necessary to pursue advanced study in engineering. A GPA of at least 2.50 for all previous work is required.

Interested students must apply for admission to this program early during the second semester of their junior year on forms available from the UND Graduate School. Each applicant will be notified in writing by the dean of the Graduate School concerning his/her status. The academic transcripts for those admitted will be marked accordingly.

Program Requirements

Students will be assigned a permanent faculty advisor by the dean of the Graduate School upon the recommendation of the chairperson of the student’s major department and the dean of the School of Engineering and Mines. The advisor will be responsible for developing with the student a detailed program of study which meets the requirements of the B.S. degree (see page 52) and the M. Engr. degree (see page 183 of this catalog). Those credits designated specifically to meet the M. Engr. degree requirements will be listed on a M. Engr. Program of Study form available from the Graduate School. The Program of Study requires the signed approval of the advisor, the department chairperson, and the dean of the School of Engineering and Mines, prior to submission to the dean of the Graduate School for final approval.

To be awarded the Master of Engineering degree, a student must satisfy the following requirements.

1. Complete all courses on the integrated program necessary to satisfy the ABET requirements for the basic level accreditation in the discipline at least one semester or summer session prior to completing the M. Engr. degree requirements. Receipt of the B.S. degree on this schedule normally will meet the requirements.
2. Submit to the Graduate School a copy of the approved undergraduate status sheet used for the award of the bachelor’s degree.
3. Complete the M. Engr. program of study containing a minimum of 30 semester credits as follows:
   (a) 15 semester credits at the 500-level.
   (b) 3 to 6 semester credits for the required design project (Engineering 595).
   (c) All major department courses at the 400- or 500-level.
   (d) No courses below 300-level.
4. Earn a GPA of 2.75 for all advanced work attempted.
5. Satisfactorily complete the design project as outlined, and submit a final written report to the advisor.
6. Pass the written final comprehensive examination(s) covering the course material in the M. Engr. program of study.

Miscellaneous

1. Financial Aid—Students are considered to be graduate students for financial aid purposes when they are admitted to the Graduate School as degree-seeking students.
2. Registration—Once admitted to the Integrated M. Engr. program, students must register through the UND Graduate School; however, academic records will be maintained also by the School of Engineering and Mines.
3. GPA requirements—Other than already stated, the GPA for the courses on the M. Engr. program of study must average no less than 2.75.
4. Transcript Entries—Admission, graduation, and status entries will appear at the time of action.
5. Candidacy—Advancement to candidacy for the M. Engr. degree includes approval of the program of study, approval of the design project proposal, and award of the baccalaureate degree.

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 course work, 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 report 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.
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, early in the second semester, must be signed by the student, the advisor, the department chairperson (or designate), 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 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 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 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 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 FINE ARTS
See Art under Departmental Programs.

MASTER OF MUSIC
See Music under Departmental Programs.

MASTER OF PHYSICAL THERAPY
See Physical Therapy under Departmental Programs.

MASTER OF PUBLIC ADMINISTRATION
See Public Administration 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 (see page 177 for a definition of 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 Registrar’s Office.

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 degree program is designed to prepare teachers for 4-year and 2-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 (see page 177 for a definition of Residence).

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 5 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 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.
DOCTOR OF EDUCATION

The Doctor of Education 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 10 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 (see page 177 for a definition of Residence).

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 also may be purchased at the University Bookstore.)
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, then submitting the proposal to the committee for approval. The approved proposal must be filed in the Graduate School. The proposal should be approved at least six months 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 course work 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 course work 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 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 course work 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 3.50 for all graduate work, (2) completed the necessary undergraduate preparation, (3) completed any departmental examinations(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—see page 188 for information regarding minors and cognates), 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 (see page 177 for definition of Residence). With prior written approval by the dean, one of the two years of residence may be completed by one year of full-time graduate work and/or research at another institution or location. Note: The Residence Requirement is in effect unless modifications have been granted by 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 “Departmental Programs.” 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.

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 upon approval of the program of study. Additional copies may be purchased at the University Bookstore.

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, then submitting the proposal to the committee for approval. The approved proposal is then filed in the Graduate School. The proposal should be approved at least six months 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 word format described in the Style and Policy Manual for These and Dissertations) also must be submitted. The abstract is published in Dissertations and Theses in the United States and Canada and 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 Philosophy degree must take a written comprehensive examination after a substantial portion of the course work 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 Gradu-
ate 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 designee, 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 course work 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 University Microfilms International before graduation.

**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 and Toxicology, and Physiology) 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 course work 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 or a cognate area and which must consist of at least 9 credit hours.

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 the courses approved for graduate credit may be included in a minor.

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.

**NOTE:** When a graduate student elects to use a 300- or 400-level course for graduate credit, it is understood that the student will be required to do additional work, over and above that typically required of undergraduates. Usually, such work is of an independent nature.
Graduate Departmental Courses, Programs

Course Work

Only the courses listed in the Graduate section of this catalog may be used as part of the major or minor for a degree program. Classes numbered 500 or higher are graduate classes; those listed with 300 and 400 numbers are upper division undergraduate classes which have been approved for graduate credit by the University Graduate Committee on the basis that additional work will be required of all graduate students in such courses.

Classes numbered 300 and higher listed only in the Undergraduate section of this catalog may be applied to a cognate area.

Common Course Numbers

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Credits</th>
<th>Code</th>
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<td>Continuing Enrollment</td>
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</tr>
<tr>
<td>Independent Study</td>
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<td>Thesis</td>
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<td>998</td>
</tr>
<tr>
<td>Dissertation</td>
<td></td>
<td>999</td>
</tr>
</tbody>
</table>

Graduate Faculty

The faculty listed in the departments are members of the Graduate Faculty. Only a Full Member may serve as the chairperson of the Advisory Committee for a student pursuing a doctoral degree or specialist’s diploma. An Associate Member may serve as the advisor for a student pursuing a non-thesis master’s degree and, under certain conditions, as the advisor for a student pursuing a thesis master’s degree. Associate Members may serve as members on any Advisory Committee.

NOTE: THE ADMISSION AND DEGREE REQUIREMENTS LISTED IN THIS SECTION ARE IN ADDITION TO THE GENERAL GRADUATE SCHOOL REQUIREMENTS.

Anatomy and Cell Biology

Professors Atkinson, Carlson (Chair), Carr, Grove, Hunt, McCormack (Graduate Director), Rada, Rieke, and Ruit

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.

Admissions Requirements

1. An overall undergraduate GPA of at least 3.00.
2. A 3-year college sequence of General Biology/Zoology.
3. A 3-year college 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. Graduate Record Examination—Placement in the 40th percentile on GRE General Test (scores from the Advanced Biology test are also recommended).
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 course work, 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 below.

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. An average of 36-50 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), Bimd 510 (Basic Biomedical Statistics), Bimd 512/513 (Seminars in Biomedical Science), Anat 515 (Histology), Anat 518 (Developmental Biology and Human Embryology), and Anat 505 (Seminar in Anatomy and Cell Biology), one semester for each year in the program, excluding year one.
3. A thesis written on an independent research problem.

Doctor of Philosophy

1. An average of 90-120 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), Bimd 510 (Basic Biomedical Statistics), Bimd 512/513 (Seminars in Biomedical Science), Anat 515 (Histology), Anat 518 (Developmental Biology and Human Embryology), Anat 513 (Gross Anatomy) or Anatomy 522 (Neuroscience), and Anat 505 (Seminar in Anatomy and Cell Biology), one semester for each year in the program, excluding year one.
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, 7 credits. A series of lectures, discussion groups, and laboratory periods with emphasis on interrelated themes in basic biochemistry, cell biology and molecular biology. Lectures will include current and emerging areas of research while lab/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.
Blmd 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.

Blmd 512. Seminars in Biomedical Science. 1 credit. A series of presentations on original research conducted by UND faculty members. Students will participate through assigned reading and writing exercises related to the presentations. Fall Semester. Co-requisite: Blmd 500 or permission of course director.

Blmd 513. Seminars in Biomedical Science. 1 credit. A series of presentations on original research conducted by UND-faculty members as well as external leaders in academic and industrial research in the biomedical sciences. Students will participate through assigned reading and writing exercises related to the presentations. Spring Semester. Permission: Course Director.

Anat 501. Biomedical Information Retrieval. 1 credit. S/U grading only. Offered every session either in a group setting or on an individual basis. This course integrates elec- tron 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.

Anat 505. Seminar in Anatomy and Cell Biology. 1 credit each semester. Seminars are designed to present current research activities of the department, to supplement course training by presenting principles of subspecialties of Anatomy not offered as organized courses, and to present current developments in various subspecialties of Anatomy and Cell Biology. Assigned readings and reports by students and lectures by staff and guest comprise the course.

Anat 513. Gross Anatomy. 7 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.

Anat 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.

Anat 518. Developmental Biology and Human Embryology. 3 credits. Prerequisite: Blmd 500 or equivalent. A problem-based course in principles of development and human embryology. Topics to include cellular and molecular mechanisms of fertilization, early development, and organogenesis. Course will involve student presentations, discussion and laboratory exercises.

Anat 522. Neuroscience. 6 credits. A multidisciplinary course designed as a research-oriented approach to introducing students to the fundamentals of neuroscience and their clinical applications. Integrated lectures, laboratories and group discussions address historical as well as current advances in cellular, molecular, developmental, sensorimotor, regulatory and cognitive neuroscience. Hands-on work in the research laboratory provides exposure to techniques commonly used to address experimental problems, reinforcing basic concepts of neuroscience.

Anat 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. Credit may be awarded for 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.

Anat 595. Advanced Gross Anatomy. Credits arranged. 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.

Art

Professors Byun, Fink (Graduate Director), Fundingsland, Lubner, McCleery, Meyers, Miller, Monsebroten, Paulsen, Stephenson

Program Description

The Master of Fine Arts degree program in Art is a strongly studio-oriented professional preparation in the media areas of ceramics, drawing, metalsmithing, painting, printmaking, sculpture, and mixed media. Within and outside the visual arts areas there is ample opportunity (and encouragement) for balanced study in art history and supporting media and disciplines, including computer/digital media.

Admission Requirements

1. Admission to Approved Status requires a B.A. or B.F.A. degree (at least 105 quarter or 70 semester hours in studio courses plus a minimum of 15 semester hours in art history) from a regionally accredited college or equivalent.

2. Twenty (20) color slides (2” x 2” cardboard or plastic mounted) of representative examples of the student’s recent work. The slides should be submitted to the Art Department Graduate Committee and accompanied by a list containing their sequence, titles, size and medium.

3. 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:

   Category | Credits
   ------ | ------
   Major Media Area (Ceramics, Painting, Drawing, Metalsmithing, Printmaking, Mixed Media, or Sculpture) | 30
   Art History and Theory | 9
   Electives (including at least 12 credits in art) | 18
   Professional Exhibition | 3

2. Formal review of the M.F.A. candidates 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. An exhibition catalog which will include an artist’s statements and reproductions of the work.
   c. A slide portfolio of the Graduation Exhibition must be submitted to the Art Department for its permanent files.

Residence Requirement. The M.F.A. degree requires at least two semesters, or one semester and two summer sessions taken within a three year period, in residence.

Professional Exhibition. All M.F.A. candidates are required to register for Art 599—Professional Exhibition (3 credits). The intention is to give candidates a summary experience as they near the end of their formal training which will serve as a benchmark in their career development. The presentation and format of the catalog may vary with what the candidate and committee deem appropriate and complimentary to the work to be presented in the exhibition. The artist’s statement may include such things as a critical statement on the candidate’s work, its development, its cultural, philosophical and historical context, and/or reference to the artist’s procedures and techniques.

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 M.F.A. 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 M.F.A. 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 M.F.A. students will be evaluated twice and recommendations will be made regarding continuation in the degree program. The first evaluation, 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 M.F.A. 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 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: Contemporary Trends and Theory, 2 credits. Presentation of contemporary trends in the visual arts from the 1960s forward and discussion of contemporary theory and criticism.
511. History of Art: Graduate Seminar, 1 credit repeatable to 2 credits. Offered 5. 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.
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 by-passing 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 show.
410. History of Art: Selected Topics, 1 to 4 credits.
411. History of Art: Study of Eastern Art from Proto-literate Periods to the Present, 3 credits.
412. History of Art: 20th Century, 3 credits.
414. History of Art: Contemporary, 2 credits.
415. History of Art: Museum Internship, 1 credit repeatable to 3.
416. History of Art: Renaissance, Baroque, Rococo, 3 credits.
419. History of Art: 19th Century Art and Architecture, 3 credits.
420. History of Art: Greek and Roman Art and Architecture, 3 credits.
421. History of Art: Computer Applications, 1 credit repeatable to 4.
422. History of Art: Computer Internship, 1 to 3 credits.

490. Individual Research/Special Projects, 1 to 6 credits. Repeatable to twelve credits.
496. Fine Arts: Symposium in the Arts. 1 to 3 credits.

Atmospheric Sciences

Professors Grainger, Osborne (Graduate Director), Poelot (Chair)

Program Description

The Department of Atmospheric Sciences offers a graduate program leading to the degree of Master of Science. The 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.

Admission Requirements

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.

Degree Requirements

The program requires that students complete 30 credits of courses from the Department of Atmospheric Sciences. A thesis is required of all students. While the actual courses required for each student will be determined on an individual basis, each student is expected to complete AtSc 500, 505, and to have had the equivalent of AtSc 350.

Courses

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.
505. Advanced Atmospheric Dynamics, 3 credits. Prerequisite: AtSc 350. 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. Prerequisites: Math 165 & 416. 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.
520. Atmospheric Chemistry, 3 credits. Prerequisites: AtSc 350 & 470. Composition of clean and polluted air. Sources and sinks of atmospheric gases and aerosols. The role of atmospheric chemistry in global environmental issues such as acid rain, visibility reduction, climatic change, oxidant enhancement, etc.
536. Numerical Weather Prediction, 3 credits. Prerequisite: AtSc 350. 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. Prerequisites: AtSc 350 & 470. 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, meterological measurement systems, and digital data logging and processing.
570. Seminar, 1 to 3 credits, repeatable to 3. A discussion course on topics of special interest, including presentations by students and faculty; discussion of current research and publications in the atmospheric sciences.
Aviation

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 professionals to solve problems within the field of aviation including the airlines, corporate aviation, general aviation, and airport management. Graduates will gain an understanding of the various complexities facing the industry through a breadth of aviation industry related courses. In addition, graduates will gain an understanding of statistics and research methods, and how they may be applied to research and 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. Bachelor's degree in Aviation/Aeronautics
2. OR Bachelor's degree from an accredited institution and a minimum of 20 semester credits of appropriate aviation related undergraduate work.
3. GRE exam — General Test
4. Overall undergraduate GPA of 2.75 or a GPA of at least 3.00 for the last two years of undergraduate work.
5. Hold a minimum of a Federal Aviation Administration Private Pilot Certificate or its foreign equivalent.
6. Students must submit a 2-3 page paper answering specific questions per departmental guidelines. One of the questions will address the potential thesis or independent study topic.

Degree Requirements

1. 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.
2. 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 997/998 Independent Study or Thesis 2-4 credits
3. 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 590 Aviation Seminar 1-3 credits
   - AVIT 593 Individual Research in Aviation 1-3 credits

Courses

1. 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.
2. Aviation Economics. 3 credits. This course will take an overall look at the structure of air transportation, including airlines, general aviation, and airports; entry and exit factors for airlines and Fixed Base Operations (FBO) costs of airlines service; costs of FBO operations; the demand for airline and general aviation services; airline and FBO rate structures and ratemaking factors; airport cost structures and ratemaking procedures; capacity management; market segmentation; demand forecasting; regulatory impact on commercial and general aviation; profits, cash flow and marketing; and revenue management. The unique economic factors of airlines and international commercial aviation, monetary exchanges and aviation credit facilities will also be discussed.
3. Statistics. 3 credits. Prerequisite: an introductory statistics course or calculus course. An in-depth study of inferential statistics with an emphasis on analysis of variance models, multiple regression techniques, analysis of covariance and other higher order statistical procedures.
4. Research Methods. 3 credits. Prerequisites: Avit 503. Methods and procedures of development, design and analysis related to aviation industry research. Topics include safety issues, survey techniques, business analysis and marketing effectiveness. The course includes the experience of critically evaluating research projects and developing a research project based on the principles discussed in class.
5. Aviation Public Policy and Regulations. 3 credits. A discussion of the initiation, formulation and implementation of aviation public policies and their effects upon the various segments of the aviation industry. Various regulatory areas such as scheduled air carriers, general aviation, airport operations, air traffic control and international agreements will be analyzed.
6. 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.
7. Aviation Environmental Concerns. 3 credits. An in-depth study of the environmental concerns within the aviation industry and how policy and decision-makers can implement effective strategies toward compatibility between the aviation industry and its environment.
8. 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.
9. Aviation Management Theory. 3 credits. An in-depth review of organizations in the aviation industry, their structures, environments and leadership as it relates to human behavior. Topics include organizational design, climate and the interactions with individuals, groups, and different organizational levels within the management of an airline, general aviation, corporate aviation and airports.
10. Human Factors: Human Perceptions in the Aerospace Environment. 3 credits. Human perception and physiology will be discussed in normal conditions and applied to the alterations seen in the aviation environment. Discussion of specific illusions will be incorporated with aircraft accident investigation reports and computer simulations. Application of perception principles to workstation and information system design will allow the student to have a greater understanding of human-centered automation goals.
11. Human Factors: Memory, Learning and Judgement: The Challenges of Training and Selection in the Aviation Industry. 3 credits. The process of memory, learning and judgment will be discussed in relation to education, performance and decision-making. The influence of stress and performance of aviation professionals. Topics include memory physiology and the effects of bias, attitude, motivation, and personality on crew performance. The course will provide an opportunity to evaluate workload, training systems design and the effectiveness in training operations, based on the principles discussed in the course.
12. 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-distict air disaster litigation; Warsaw Convention and international law and treaties; Environmental Protection Act regulations; product liability, and workers compensation.
13. Aviation Seminar. 1-3 credits. A series of lectures presented by visiting lecturers and the faculty. May be repeated for up to 4 credits.
14. Individual Research in Aviation. 1-3 credits. Individual student projects designed to develop advanced knowledge in a specific area of expertise. A written report is required. May be repeated for up to 6 credits.
Biochemistry and Molecular Biology

Professors Detke, Lambeth (Interim Chair), Milavetz, Shabb (Graduate Director), Sukalski, Vaughan, Adjunct Professors Davis, Johnson, Nielsen, Reeves

Program Description
For more information, please visit our WEB site: http://www.med.und.nodak.edu/bimd/biochem.html

The department of Biochemistry and Molecular Biology offers graduate programs leading to the M.S., Ph.D., and M.D./Ph.D. degrees. All programs are research-oriented and students begin research work during their first year. These graduate programs prepare scholars for a variety of careers including academic teaching and research, and research associated careers in various governmental, industrial, and private research laboratories.

The department is housed within the Edwin C. James Medical Research Facility of the University of North Dakota School of Medicine. Research is conducted in the areas of intermediary metabolism, enzymology, neurochemistry, protein/ protein interactions, endocrinology, enzyme and metabolic regulation, membranes, roles of free radicals in biological systems, receptor proteins, signal transduction, membrane transporter regulation, protein engineering, and molecular genetics. Adjunct professors at the United States Department of Agriculture Human Nutrition Research Center provide additional research opportunities for graduate students in our program. The Center carries out research to assess nutrient needs for humans with an emphasis on determining mineral requirements that prevent disease and promote health and optimal function throughout life.

Admission Requirements
1. A minimum of 20 semester credits (or equivalent) in chemistry or in chemistry plus biology, including at least 6 semester hours of credit in organic chemistry.
2. Courses in Analytical Chemistry and Biology are highly desirable.
3. The general Graduate Record Examination is required. An Advanced Graduate Record Examination in an area related to Biochemistry and Molecular Biology is optional.
4. A minimum TOEFLscore of 550 for international applicants whose native language is not English.

Financial Assistance
Most students are supported by Graduate Teaching or Graduate Research Assistantships. International students whose native language is not English must score at least 50 on the Test of Spoken English to maintain eligibility for a graduate teaching assistantship. Students may apply for admission at any time, but those seeking financial aid should complete their application by March 1, since appointments are generally made in March or early April for the coming academic year.

Degree Requirements
Master of Science
1. A minimum of 30 credit hours including research and thesis.
2. A grade of at least C in BIMD 500.

Doctor of Philosophy
1. Performance of original research of a quality suitable for publication in a refereed, professional journal and the preparation of a dissertation based thereon.
2. A minimum of 90 credit hours, including research and dissertation.
3. A scholarly tool (normally met by taking BIMD 510 or its equivalent).
4. A grade of at least B in BIMD 500.
5. Completion of BIMD 510, 512 and 513.
6. Completion of Biochemistry and Molecular Biology 531 and 532.
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 course work outside of the department.
10. Passing performance on oral and written comprehensive examinations covering the course work 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 meet the following requirements:
1. Accumulation of a minimum of 26 graduate credits with a GPA of 3.5 or greater.
2. Minimum cumulative GPA of 3.0 in BIMD 500, 510, 512 and 513 and either Biochemistry and Molecular Biology 531 or 532.
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. 7 credits. Prerequisite: 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. The focus of this interdepartmental team-taught course will be in areas that are fundamental to all biomedical science graduate programs. Emphasis will be on developing a solid grounding in biochemistry, cell biology and molecular biology with themes covering proteins, metabolism, information flow, vectors, membranes, cell signaling, cell shape and movement, cell growth and division, and immunology.

BIMD 510. Basic Biometric 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 512. Seminars in Biomedical Sciences. 1 credit. Corequisite: 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. Prerequisites: Bimd 512 or permission of course director. 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 presentation.

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. S/U grading only.

531. Advanced Biochemistry and Molecular Biology I. 3 credits. Second semester, alternating years with Biochemistry 532. Prerequisites: BIMD 500; alternatively, Biochemistry 301 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 and regulation with the intent of complementing and extending the knowledge base gained in BIMD 500. The course is team-taught. Extensive independent learning is expected.

532. Advanced Biochemistry and Molecular Biology II. 3 credits. Second semester, alternating years with Biochemistry 531. Prerequisite: BIMD 500; alternatively Biochemistry 301 or equivalent and permission of instructor. The purpose of this course is to provide an in-depth exploration of selected areas of recombinant DNA technology and eukaryotic nuclear acid metabolism and gene expression with the intent of complementing and extending the knowledge base gained in BIMD 500. The course is team-taught. 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. Conference and/or written reports are required.

Biology

Professors Austin, Carmichael, Crawford, Fivizzani, Gerber, Kelsch, La Duke (Chair), Lang, Meberg, Newman, Pyle, Schlosser, Sheridan, Sweiizer, 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. We encourage you to look at the departmental web page for information on faculty and their research interests (www.und.nodak.edu/department/biology). 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
- Neurobiology
- Morphology
- Physiology
- Systematics
- 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 is located in Starcher Hall which was completed in 1981. This structure contains greenhouse facilities, herbarium, controlled environment chambers, animal rooms for terrestrial and aquatic organisms, observation rooms for behavioral studies, vertebrate and invertebrate research museums, tissue culture, isotopes, chromatography, and data analysis rooms, molecular biology laboratories, and a darkroom.

The department operates two field stations for research and class use. The Forest River Biology Area is 40 miles from the campus. It includes habitats suitable for studies in aquatic and woodland biology: spring brook, swamp, moor and dry woods, and a section of the Forest River. The Oakville Prairie Station consists of 200 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. The department participates in the planning for the University of Minnesota Forestry and Biological Station at Itasca through representation on the Itasca Advisory Council.

Admission Requirements

1. An undergraduate major or its equivalent in the biological sciences with at least 24 semester credits in biology.
2. Graduate Record Examination—both the General and the Advanced Test in Biology (Doctoral applicants must average at least the 50th 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 50 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 1, 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. Normally, master’s degree students are limited to two years of such support, while doctoral students may receive teaching assistantship support for up to three years beyond a master’s degree. 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

This 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 course work in a supporting area; (3) five credits of course work in each of two supporting areas. (Supporting areas include anatomy, biochemistry, chemistry, computer science, 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.
520. Population Biology. 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. Phytoecotography, environmental influences, and community dynamics of grassland ecosystems with emphasis on heritage production, ecosystem modeling, and ecological characteristics of major grass species.
534. Quantitative Ecology. 2 credits.
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 345 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 357 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.
571. Advanced Biometry. 3 credits. Prerequisite: an introductory course in statistics. Advanced topics in experimental design and statistical methods with emphasis on applications in biological research.
590. Special Topics. 1 to 4 credits. Prerequisites: Graduate status or upper division status with consent of instructor. Important and current topics in biology not covered by other courses. Repeatable when topics vary. Examples include: Aquaculture, Big Game Biology, Bioethics, Conservation Biology, Fire Ecology, Molecular Techniques, Plant-Animal Interactions, Sex Determination and Speciation.
592. Directed Studies. 1 to 4 credits. Designed to meet the needs of individual and small groups of students in areas of faculty specialization. May be repeated to a total of 12 credits.
599. Research. Credits arranged. Maximum of 15 credits per semester. Intended for students conducting original research in consultation with staff. S/U grading only.
312. Evolution. 3 credits.
315. Genetics. 3 credits.
322L. General Ecology Lab. 1 credit.
532L. Population Biology Lab. 3 credits.
536. Systematic Botany. 4 credits.
338. Animal Behavior. 2 credits.
338L. Animal Behavior Lab. 2 credits.
341. Cell Biology. 3 credits.
341L. Cell Biology Lab. 1 credit.
363. Entomology. 4 credits.
364. Parasitology. 2 credits.
364L. Parasitology Lab. 2 credits.
369. Histology. 2 credits.
369L. Histology Lab. 2 credits.
370. Vertebrate Zoology. 3 credits.
371. Anatomy and Adaptations Laboratory. 2 credits.
373. Vertebrate Natural History. 3 credits.
375. Invertebrate Zoology. 4 credits.
376. Developmental Biology. 3 credits.
425. Ichthyology. 3 credits.
427. Ornithology. 3 credits.
428. Mammalogy. 3 credits.
431. Wildlife Management. 4 credits.
432. Fish and Wildlife Disease. 3 credits.
433. Aquatic Ecology. 3 credits.
433L. Aquatic Ecology Lab. 1 credit.
438. Fisheries Management. 3 credits.
442. Physiology of Organs and Systems. 4 credits.
445. Molecular Genetics. 2 credits.
470. Biometry. 3 credits.

Business Administration

Professors Askim, Bateman, Beard, Braathen, Carlson, Chong, Dosch, Elbert, Ellingson, Hansen, Haskins, Hiltner, Kendig, Lee, Loyland, Moser, S. Nelson, T. Nelson, Ness, O’Keefe, Park, Potter, Robles, Vitton, Wambgsanss (Graduate Director), Wilde, Zahrly; also Graduate Faculty from Economics: Professors Bagheri, Biederman, Blackwell, O’Neill, Ramsett, Stradley

Program Description

The Master of Business Administration (M.B.A.) is a professional degree with a program designed to prepare persons for general management responsibilities at the executive level. The program is accredited by AACSB International (the Association to Advance Collegiate Schools of Business). The recipient of the degree must have demonstrated critical, analytical, and decision-making abilities in the broad area of management and also must have demonstrated an ability to study and write in one specialized area. The M.B.A. degree program is designed for individuals who have an undergraduate background in a field other than business as well as for those with undergraduate training in business.

Admission Requirements

Admission to Approved Status requires:
1. A baccalaureate or higher degree from a regionally accredited institution. Holders of a 3 year degree may be admitted under the combined model of admission.
2. Completion of the Graduate Management Admission Test (GMAT) with a score that equals or exceeds an overall total score of 450. Those being admitted under the combined model must complete the GMAT with a score that equals or exceeds an overall total score of 500.
3. An overall grade point average of at least 2.75 in the undergraduate degree program or of at least 3.00 for the last two years, or equivalent, of undergraduate work (based on 4.00 scale). An overall grade point average of at least 3.0 must be achieved for students admitted under the combined model.
4. Command of the MBA Core Curriculum (see description below).

Applicants who meet the first three requirements listed above, but have not met the course work requirements in the MBA Core Curriculum may be admitted to Approved Status. Applicants who fail to meet the minimum grade point or GMAT requirements, but who otherwise show high potential for success may be considered for admission to Provisional Status, provided they meet one of the following indices:
1. a composite index score of at least 950 determined by the formula: (GMAT) + [200 x (overall undergraduate gpa)]
2. a composite index score of at least 1000 determined by the formula: (GMAT) + [200 x (last 2 years or equivalent undergraduate gpa)]
Under no circumstances will applicants with GMAT scores below **400 (500 for students under the 3/2 model)** be recommended for admission. The average GMAT score of successful applicants for the five year period beginning with the 1995-96 academic year was 525.

**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.

**MBA Core Curriculum**

Applicants must demonstrate command of a core curriculum in business and administration through course work in economics, accounting, quantitative methods, the functional areas of business, mathematics, and administrative process. This command normally will have been demonstrated by completion of the following UND undergraduate courses or their equivalents or by competency examinations.

**Academic Year Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting 200-201</td>
<td>Elements of Accounting I &amp; II</td>
<td>6 credits</td>
</tr>
<tr>
<td>Accounting 275</td>
<td>Accounting for Pre-MBA</td>
<td>3 credits</td>
</tr>
<tr>
<td>ISYS 217</td>
<td>Fundamentals of Management Information Systems</td>
<td>4 credits</td>
</tr>
<tr>
<td>Economics 201</td>
<td>Principles of Microeconomics</td>
<td>3 credits</td>
</tr>
<tr>
<td>Economics 202</td>
<td>Principles of Macroeconomics</td>
<td>3 credits</td>
</tr>
<tr>
<td>Economics 210</td>
<td>Introduction to Business and Economic Statistics</td>
<td>3 credits</td>
</tr>
<tr>
<td>Mathematics 146</td>
<td>Applied Calculus I</td>
<td>3 credits</td>
</tr>
<tr>
<td>Accounting 315</td>
<td>Business in the Legal Environment</td>
<td>3 credits</td>
</tr>
<tr>
<td>Finance 310</td>
<td>Principles of Finance Management</td>
<td>3 credits</td>
</tr>
<tr>
<td>Management 300</td>
<td>Principles of Management</td>
<td>3 credits</td>
</tr>
<tr>
<td>Management 301</td>
<td>Production Management</td>
<td>3 credits</td>
</tr>
<tr>
<td>Marketing 305</td>
<td>Marketing Foundations</td>
<td>3 credits</td>
</tr>
</tbody>
</table>

The above courses are described in the departmental listings covering undergraduate programs.

**Degree Requirements**

The M.B.A. degree program is an interdisciplinary one, taught by the faculty in several divisions 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 Faculties of Accounting, Finance, Economics, Political Science & Public Administration, and Information Systems, Marketing, and Management 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 and concentration.**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management 501</td>
<td>Quantitative Analysis for Management Decisions</td>
<td>3 credits</td>
</tr>
<tr>
<td>Management 505</td>
<td>Policy Formulation and Administration</td>
<td>3 credits</td>
</tr>
<tr>
<td>Management 515</td>
<td>Advanced Managerial Theory</td>
<td>3 credits</td>
</tr>
<tr>
<td>Marketing 510</td>
<td>Strategic Market Planning</td>
<td>3 credits</td>
</tr>
<tr>
<td>Economics 509</td>
<td>Macroeconomic Decision-Making</td>
<td>3 credits</td>
</tr>
<tr>
<td>Accounting 509</td>
<td>Accounting Information for Decision and Control</td>
<td>3 credits</td>
</tr>
<tr>
<td>Finance 501</td>
<td>Managerial Finance</td>
<td>3 credits</td>
</tr>
<tr>
<td>ISYS 510</td>
<td>Information Systems</td>
<td>3 credits</td>
</tr>
</tbody>
</table>

**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, Finance, Economics, Political Science & Public Administration, and Information Systems, Marketing, and Management, and related fields. A cognate may be chosen from selected courses in the aviation management area. All cognate elective courses and aviation management cognate courses must be approved by the M.B.A. Program Director prior to enrollment.

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. 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 505, Policy Formulation and Administration. Students must complete 12 credits of M.B.A. curriculum courses before enrolling in Management 505.

**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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting 200 &amp; 201</td>
<td>Elements of Accounting I &amp; II</td>
<td>6 credits</td>
</tr>
<tr>
<td>Accounting 301 &amp; 302</td>
<td>Intermediate Accounting I &amp; II</td>
<td>8 credits</td>
</tr>
<tr>
<td>Accounting 309</td>
<td>Accounting Information Systems</td>
<td>3 credits</td>
</tr>
<tr>
<td>Accounting 320</td>
<td>Accounting for Production Auditing</td>
<td>3 credits</td>
</tr>
<tr>
<td>Accounting 405</td>
<td>Auditing</td>
<td>3 credits</td>
</tr>
<tr>
<td>Accounting 411</td>
<td>Business Income Taxation</td>
<td>3 credits</td>
</tr>
</tbody>
</table>

**Total Minimum 26 credits**

The graduate level concentration in accounting includes the following:

1. Twelve (12) credits including Accounting 509 and a minimum of nine (9) credit hours to be selected from the following accounting classes: 312, 401, 406, 410, 501 or 591, 503, 504, 507, 592.

2. Two (2) credits of Independent Study, Business Administration 997.

If choosing accounting as a concentration, the Independent Study would focus on the field of accounting.

Of the courses selected from #1 above, a maximum of six hours may be selected from undergraduate (300-499) courses. If undergraduate courses are selected, additional work is necessary for the course to qualify for graduate credit.

**Courses**

**ACCOUNTING**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>501</td>
<td>Seminar in Accounting Problems</td>
<td>1 to 4 credits</td>
</tr>
<tr>
<td>503</td>
<td>Accounting Theory</td>
<td>3 credits</td>
</tr>
<tr>
<td>504</td>
<td>Advanced Auditing</td>
<td>3 credits</td>
</tr>
<tr>
<td>505, 506</td>
<td>Specialized Accounting Problems</td>
<td>6 credits</td>
</tr>
<tr>
<td>507</td>
<td>Advanced Managerial Accounting</td>
<td>3 credits</td>
</tr>
<tr>
<td>509</td>
<td>Accounting Information for Decision and Control</td>
<td>3 credits</td>
</tr>
<tr>
<td>510</td>
<td>Industrial Quantitative Controls</td>
<td>3 credits</td>
</tr>
<tr>
<td>575</td>
<td>Special Topics</td>
<td>3 credits</td>
</tr>
</tbody>
</table>
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.

306. Cost Accounting II. 3 credits.

309. Accounting Information Systems. 3 credits.

312. Fund Accounting. 3 credits.

401. Advanced Accounting. 3 credits.

403. Contemporary Accounting Theory. 3 credits.

405. Auditing. 3 credits.

406. Auditing Problems. 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.

996. Continuing Enrollment. Variable credit.

997. Independent Study. 2 credits.

(May be repeated for credit if topics change. See page 167 for details on 996 and page 174 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. 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. 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.

509. Macroeconomic Decision-Making. 3 credits. Prerequisite: Economics 202. 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.

514. Advanced Managerial Economics. 3 credits. Prerequisite: Economics 201. ISys 217 and Math 146, or permission of the instructor. Microeconomic analysis applied to business decision making. Topics include: estimation of demand, production and cost functions; pricing to achieve the firm’s objectives under a variety of market conditions. Quantitative analysis is stressed and use of the personal computer and appropriate software is an integral part of the course.

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. Taxation and 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: 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.

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. Readings in Economics. 1 to 3 credits. Extensive readings to cover areas in which a student’s background may be deficient or in areas of specialization or interest; conferences with the instructor; written reports.

Courses Listed below are described in the undergraduate section of this catalog, and may be taken by MA students who did not take them as undergraduates. MA 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 Economics 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: Finance 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.

57S. 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.

410. Cases in Managerial Finance. 3 credits.

420. Investment Analysis and Portfolio Management. 3 credits.

MANAGEMENT

501. Quantitative Analysis for Management Decisions. 3 credits. Course consists of an application of quantitative techniques for management decisions. Both mathematical techniques and computer analysis of decisions will be stressed. Topics will include deterministc and probabilistic models in areas such as linear and quadratic programming, inventory systems, queuing models, game theory, and simulation.

505. Advanced Strategic Management. 3 credits. Prerequisite: 12 credits of M.B.A. core courses or consent of instructor. An integrating course designed to develop coordinating ability and experience in the decision-making process. Taught from the point of view of the top management and by the case method, the course develops understanding of an overall point of view, through analysis of actual business situations, and an appreciation of the relations of the production department to other departments and to the business as a whole. Concluding cases place emphasis on the responsibilities of business enterprise to the community and to society generally.

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. Micro-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 nine 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 217. 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. Prerequisite: Marketing 305. Marketing from the point of view of an executive charged with the marketing function in a business enterprise. The course introduces students to marketing decision making using computerized decision support systems. Students will also work with existing or prospective business in developing a comprehensive marketing plan.

511. Seminar in Marketing. 2 to 6 credits.

512. Promotional Strategy. 3 credits. Prerequisite: Marketing 305. The analysis, planning, and evaluation of promotion strategy. Examines various kinds of communication about goods and services including advertising, personal selling, sales promotion, and publicity. On demand.

546. Marketing Seminar. 3 credits. Prerequisite: Marketing 305. Emerging topics in the field of marketing. On demand.
Career & Technical Education

Professors Braathen, O’Keefe, Prigge, Robles (Coordinator)

Program Description

The M.S. in Career and Technical Education is designed to provide a master’s degree for educators in all service areas of Career and Technical Education. The latest issues and trends in Career and Technical Education will be incorporated into the curriculum. Courses will provide general information about Career and Technical Education as well as specific concentrations in each of the service areas.

Admission Requirements

1. A minimum of 20 semester hours of undergraduate course work in an area related to Career and Technical Education, e.g., business education, marketing education, agriculture, special populations, counseling and guidance, industrial technology, etc.

2. At least one year of successful teaching experience or one year of successful occupational experience equivalent to Career and Technical Education certification requirements of the North Dakota State Board for Vocational Technical Education.

Degree Requirements

1. Major must include courses in career and technical education and an independent study.

2. A minimum of 32 semester credits including 9 semester credits for approved minor or cognate courses.

3. Independent Study. The independent study is designed to require the student independently to investigate a topic related to the major field. The 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. The requirement is to ensure that the student can investigate a topic and organize a scholarly report on the subject.

Courses

ISBE 503. Improvement of Instruction and Research in Business Education Skill Subjects. 1 to 4 credits. Organization, methods of instruction, and research in business education skill subjects — keyboarding, shorthand and alternative writing methods, or keyboard-based skill courses.

ISBE 505. Improvement of Instruction and Research in Business Education Subjects. 1 to 4 credits. Organization, methods of instruction, and research in business education cognitive subjects, such as accounting/bookkeeping, basic business, business communications, office procedures, computer/data processing.

ISBE 524. Issues and Trends in Career and Technical Education. 3 credits. A study of current issues, trends, and problems related to career and technical education. Specific topics covered include: professional organizations, the historical development of career and technical education, teaching methods, principles of evaluation, test construction, and competency-based programs.

ISBE 529. Part-time and Adult Programs in Career and Technical Education, 3 credits. Problems of adult career and technical education including the determination of need, selection of teachers, appropriate teaching procedures, methods of financing, and planning community programs.

ISBE 530. Administration and Supervision in Career and Technical Education, 3 credits. Principles of effective administration and supervision; administering programs sponsored by federal career and technical legislation and administered by state and local boards of education; functions of state plans, study of program standards; planning physical facilities; supervisory duties on local, state, and national levels.

ISBE 531. Career and Technical Education for Special Populations, 2 credits. Develop an appreciation of the important role of Career and Technical Education in the education of students with special needs and enhance the level of understanding of the requirements of current legislation impacting special populations. Develop a working knowledge of compliance issues and how to meet the needs of learners from special populations including instructional and learning strategies, assessment tools, and comprehensive transition planning.

ISBE 535. Career and Technical Education Research, 2 credits. Study of significant research in Career and Technical Education; research methodology; organization and presentation of research data; and application of research to Career and Technical Education topics.

ISBE 536. Seminar in Vocational Education, 2 credits. Opportunity for graduate students to study advanced problems in vocational education.

ISBE 537. Career and Technical Education in Post Secondary Schools, 3 credits. Administrative and curricular considerations in career and technical education programs for junior colleges, private business schools, technical institutions, teacher-education programs, collegiate schools of business, and graduate schools, teacher certification, field trips and interviews with officials at post secondary institutions.

ISBE 539. Professional Writing in Business Education. 3 credits. Preparation of behavioral objectives for business non-skill and skill subjects. Development of shorthand and keyboarding teaching materials to include such controls as syllabic intensity, stroke intensity, and diagrammatical constituency; textbook and article-writing; legal aspect of royalty and authorship. Each student must prepare three articles and a textbook prospectus to be submitted for publication.

ISBE 540. Special Topics in Vocational Education. 1 to 3 credits. An intensive study of a topic of interest to vocational educators. The topics of study will vary and the course may be repeated for credit provided the subject of study differs.

ISBE 541. Directed Study in Vocational Education. 1 to 2 credits. Specialized study to identify and analyze facets of vocational education through campus and field experiences. Philosophy, objectives, issues and problems, criteria for evaluation, cooperative programs, youth organizations, research, and administration of individual vocational education service areas. Repeatable to 6 credits.

ISBE 546. Research Seminar in Career and Technical Education, 2 credits. Overview of graduate program requirements and timelines. Includes analysis and review of independent study requirements and content and supervision of original investigations being made by graduate students.

ISBE 550. Technology in Career and Technical Education, 3 credits. Broad exposure to rapid changes in the field of information system, business, industrial, and educational development. Topics may include IS functions, office automation, end-user computing, Internet activities, records and micro-graphics systems, digital imaging, telecommunications, systems analysis, and other current technological topics.

ISBE 580. Internship in Vocational Education, 1 to 6 credits. Field work in supervising and administering vocational education programs on secondary or post-secondary levels or occupational experience while under the direction of a qualified vocational administrator or supervisor. S/U grading only. May be repeated.

ISBE 591. Research in Business Education. 1 to 3 credits. Repeatable to six credits.

ISBE 595. Readings in Business and Vocational Education. 1 to 3 credits. Repeatable to six credits.

ISBE 596. Problems in Distributive Education, 1 to 3 credits. Credits and hours arranged by the instructor. Selected problems in development and expanding distributive education.

ISBE 524. Issues and Trends in CTE 3 credits.
ISBE 529. Part-time & Adult Programs in CTE 3 credits.
ISBE 530. Administration & Supervision in CTE 3 credits.
ISBE 531. CTE for Special Populations 2 credits.
ISBE 537. CTE in Post Secondary Schools 3 credits.
ISBE 540. Research Seminar in CTE 2 credits.
ISBE 546. Seminar in Vocational Education 2 credits.
ISBE 549. Professional Writing in Business Education 3 credits.
ISBE 550. Technology in CTE 3 credits.
ISBE 557. CTE in Post Secondary Schools 3 credits.
ISBE 564. Research Seminar in CTE 2 credits.
ISBE 550. Technology in CTE 3 credits.
ISBE 597. Independent Study 2 credits.
ISBE 997. Minor/Cognate 9 credits.
Total Minimum 32 credits.

Total Required Hours 23 credits
Chemical Engineering

Professors Benson, Erjavec, Hasan (Chair), Hurley, Mann, Muggli, Olson, Seames

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 multidisciplinary Energy Engineering Ph.D. program. The M.S. or M.Eng. degree can be completed in one year 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 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 (MEng) degrees. The intention of the BSChE/M.S. and the BSChE/MEng program is to allow qualified students to complete requirements for both degrees in one year beyond which is required to receive the baccalaureate degree.

Research interests in the department include energy processes and technology, multiphase fluid flow and heat transfer in pipes and wellbores, surface science, environmental catalysis, process modeling and control, and engineering statistics. Research projects are often done in collaboration with the Energy & Environmental Research Center (EERC), which has extensive analytic, laboratory, and pilot plant facilities.

Admission Requirements

Master of Science

1. B.S. degree in chemical engineering from an ABET accredited program. (Students holding a B.S. degree in a science field may be admitted to Qualified Status with an obligation to acquire a background in chemical engineering.)
2. An overall undergraduate GPA of at least 2.75 or a GPA of at least 3.00 for the last two years. (An overall GPA of at least 3.3 for the 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 BSChE/MEng degree is required.)

*Students applying for the BSChE/MS and BSChE/MEng 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 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.

**All 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 energy 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 Chem 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 Chem 403 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, Chem 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.
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.
562. Seminar in Chemical Engineering. 1 credit. Conferences and reports on current developments in Chemical Engineering. S/U 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. S/U 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. S/U 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. S/U grading only.

Chemistry

Professors Abrahamson (Chair), Ballantine, Boring, Hoffmann, Kozlik, Pierce, Shay, Smoliakova, Stahl, Thomasson, Tilotta

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 B.S./M.S. program (using the non-thesis M.S. option) for students who meet the admission criteria listed below.

Current areas of research specialization are synthetic and structural Organonometallic Chemistry, Photochemistry, Theoretical Chemistry, Environmental Chemistry, Electroanalytical Chemistry, Chromatographic Methods, X-ray Crystallography, Synthetic Inorganic and Organic Chemistry, Optical Spectroscopy, Analytical Instrumentation, Inorganic
Compounds for Materials Science, Carbohydrate Chemistry, Physical Biochemistry and Biocatalysis, Theoretical Biophysical Chemistry.

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**

(Non-thesis option)

Admission Requirements

1. An ACS approved baccalaureate degree in chemistry.
2. Satisfactory performance on an eligibility examination given by the Department. Normally, this examination is taken prior to registration for final undergraduate year.
3. Chemistry 488 (Undergraduate Seminar) or equivalent.
4. Chemistry 455 (Spectroscopy and Structure) or equivalent.
5. Chemistry 492 (Senior Research) or equivalent.
6. Nine credits of Graduate-level Chemistry courses. Note that the subject matter of these courses will restrict the range of possibilities of specialization (i.e., Analytical, Inorganic, Organic, Physical) for the graduate degree.

**Master of Science**

(Thesis option)

**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. One year of German desirable.
5. Graduate Record Examination General and Advanced Chemistry tests for students with degrees from foreign institutions. Students with a bachelor’s degree may be directly admitted into the Ph.D. program.
6. Chemistry 455 (if equivalent course has not been taken previously).

**Degree Requirements**

**Master of Science**

(Non-thesis option)

Degree Requirements (32 credits total)

1. 12 credits from Chem 510, 511, 512, 520, 521, 522, 530, 531, 532, 534, 540, 541, 542, and 543. At least 3 credits must be from student’s division (i.e., Analytical, Inorganic, Organic, Physical).
2. 1 credit of Chem 509 (Seminar).
3. 6 credits of Electives (taken from courses listed in Graduate Catalog)
4. 2 credits of Chem 997 (Independent Study Report). Preparation of a written independent study and oral presentation of results to the advisor and interested faculty are required for successful completion of this course.
5. Either:
   a. (Co-op track) 8 credits Chem 537 (Graduate Cooperative Education) or (b) (Research track) 11 credits Chem 599 (Research)
6. A written Comprehensive Examination in analytical, inorganic, organic, and physical chemistry will be taken at the beginning and/or end of the final semester in residence. Students will be required to pass the nationally-normed ACS exam in their major area at a proficient level and pass all other exams at a competent level.

**Master of Science**

(Thesis option)

1. Chemistry 509 (1 credit).
2. Six (6) credit hours from major sequence (Analytical: 540, and one of: 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 course work.
5. Chemistry 455 (if equivalent course has not been taken previously).  
6. 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. Chemistry 509 (two credit hours).
2. Nine (9) credit hours of 500-level courses from major sequence (Analytical: 540 and six hours selected from 541, 542, or 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 455 (if equivalent course has not been taken previously).
5. Chemistry 599 (Research).

**Courses**

509. Seminar, 1 credit.

510. Intermediate Inorganic Chemistry, 3 credits. Three hours lecture. Prerequisite: Chemistry 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: Chemistry 510. Structure of coordination compounds, mechanisms of inorganic reactions, biochemical applications of inorganic chemistry.

512. Organometallic Chemistry, 3 credits. Prerequisites: Chemistry 510. Preparation, bonding and reactivity of organometallic compounds, both main group and transition metal.

519. Special Topics in Inorganic Chemistry, 1 to 3 credits. Prerequisite: Chemistry 510. Topic of current interest to be considered each semester; may be repeated for credit if topic is different.

520. Advanced Organic Chemistry I, 3 credits. Three hours lecture per week. Prerequisite: Chemistry 352 or equivalent. Carbocations and carbenes. Substitution, elimination and addition reactions. Carbonyl chemistry.


529. Special Topics in Organic Chemistry, 1 to 3 credits. Prerequisite: Chemistry 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: Chemistry 465 or equivalent. Application of classical and statistical thermodynamics to chemical equilibrium, phase equilibria and the physical properties of solutions.

531. Chemical Dynamics, Three credits. Three hours lecture. Prerequisite: Chemistry 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. Introduction to Molecular Structure and Spectroscopy, 3 credits. Three hours lecture. Prerequisite: Chemistry 464 or equivalent. Application of the time-dependent Schrödinger equation to rotational, vibrational and magnetic spectroscopy; selection rules. Relation of molecular structural parameters and spectroscopic measurements; principles of group theory.

534. Quantum Chemistry, 3 credits. Three hours lecture. Prerequisite: Chemistry 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.
Civil Engineering

Professors Abolmaali, Gullicks, Jerath, Mason, Moretti (Chair)

Program Description

The Department of Civil Engineering offers graduate programs leading to the Master of Engineering degree with 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 of Civil Engineering also participates in an interdisciplinary Ph.D. Engineering Program. For information please contact the Civil Engineering Department.

Admission Requirements

1. Bachelor of Science degree in Civil Engineering from an ABET accredited program.
2. Graduate Record Examination General Test for applicants from non-ABET accredited programs.

Degree Requirements

1. Total of thirty (30) credit hours.
2. a) Soils-Structures option requires CE 501, CE 502 and ME 529.
   b) Environmental-Water Resources option requires CE 531, CE 532, and CE 533.
   c) General Civil option requires CE 501, CE 523 and CE 531.
   d) 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.

Clinical Laboratory Science

Professors Bruce (Graduate Director), Larson, Paur, Sopher

Program Description

The Department of Pathology offers a graduate program leading to the Master of Science Degree in Clinical Laboratory Science, non-thesis option. The M.S. degree is offered both on campus and through teleconferencing. It provides a broad medical science background. This curriculum is designed to prepare students for careers as administrative laboratory directors, clinical laboratory consultants, technical supervisors or laboratory educators.
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/ASCVP, or equivalent certification examinations.
3. Experience in a medical laboratory prior to admission is recommended.

Degree Requirements
1. A minimum of 32 semester credits.
2. Major area is 22 credits in the clinical laboratory sciences.
3. A cognate area of study or minor (minimum of 9 credits) is optional.
4. A two credit capstone course in Clinical Laboratory Science.
5. The required core is as follows:

   *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 Lab.  2 cr
   *CLS 506  Clinical Chemistry  2 cr
   *CLS 507  Clinical Immunohematology  2 cr
   CLS 510  Erythrocytes in Health and Disease (Laboratory)  1 cr
   CLS 511  Leukocytes in Health and Disease (Laboratory)  1 cr
   CLS 512  Immunohematology (Laboratory)  1 cr
   *CLS 513  Adv. Clinical Immunology for Lab. Professionals  2 cr
   CLS 515  Capstone Course  2 cr
   CLS 521  Seminar  1 cr
   CLS 591  Directed Studies  2 cr
   CLS 597  Independent Study  2 cr
   CLS 599 7 Independent Study  3 cr

   Total  24-27 cr

* Classes with an asterisk (*) will be offered via distance learning — Education Telephone Network, internet, or video conferencing.

‡ The requirement for the major is CLS 505 and/or a management course such as MGMT 305.

Courses
501. Quality Assurance in the Clinical Laboratory. 2 credits. Prerequisite: Path 480, 481 and 482 or equivalent courses. 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. Prerequisite: Path 325, 481, 510 or consent of instructor. 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. Prerequisite: Path 325, 481 or consent of instructor. 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 will cover the study of human pathogenic microbes including bacteriology, parasitology, virology, mycology and antimicrobial agents. The information presented will include beginning through advanced knowledge and include both traditional and molecular identification.

505. Financial Management of the Clinical Laboratory. 2 credits. This course presents an overview for 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. Prerequisite: Path 481, Biochem 301, or equivalent courses. 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. Prerequisite: Micro 329, 529 or consent of instructor. 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 leadership portion will be discussion focused on developing personal and interpersonal leadership skills and on directing at the managerial and organization level through principle centered leadership. Some specific areas to be covered will be presentations and discussion on principle centered leadership, the PS Paradigm, improving listening skills, leading in healthcare organizations, missioning and co-missioning with organizations, and how to help organizations to become more embracive and adaptive to change. The conflict resolution portion will be an introduction to diagnosing and mediating conflict with discussions and examples of the traditional mediation process as well as transformative mediation.

510. Erythrocytes in Health and Disease Laboratory. 1 credit. Prerequisite: Path 325, 481, 502 or consent of instructor. 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. Prerequisite: Path 325, 481, 503 or consent of instructor. 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. Prerequisite: Path 507, 481, Micro 328 or consent of instructor. 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.

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.

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 Fiordo, Ganje, Hikins (Graduate Director), Holden, Kraidy, Rakow, Rendahl (Chair), Shafer

Department Description
The School of Communication offers the Master of Arts degree with a major in Communication. The mission of the programs in the School of Communication is to provide advanced study in the field of communication in order to meet the social, cultural, economic, and educational needs of the State of North Dakota and beyond.

Master of Arts with a Major in Communication

Program Description
The Master of Arts degree (thesis and non-thesis options) with a major in Communication prepares students for careers in academia, public service, and industry. The program can be tailored to individual student needs with the help of an advisor. Although the program is designed for students with undergraduate degrees in communication, persons with background in related fields in the humanities or social sciences are encouraged to apply.

The focus of the M.A. program is “Communication, Community, and Technology.” Within this broad framework, the course work and faculty interaction enable students to investigate in a critical and
Communication Sciences and Disorders

Professors Fire, Hess, Madden, Rami, Swisher (Chair)

Master of Science Degree in Speech-Language Pathology

Doctor of Philosophy — Speech
and Hearing Science

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 Speech and Hearing Science. 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.

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.

525. Interpersonal Relations and Communication. 3 credits. Face-to-face and mediated transactions between two people or people in small groups in diverse settings. Deals with inquiry, conflict management, interpersonal sensitivity, individuality, and conformity.

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: Organizations 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 communication strategies designed to influence audiences across contexts (e.g., advertising, journalism, public relations, social movements, grass roots 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. 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. 1 to 3 credits. Discussion of selected topics in speech communication and mass communication.

591. Individual Readings and Research. 1 to 3 credits. Directed readings and research in speech communication and mass communication topics and issues. May be repeated to a total of 6 credits.

310. Communication and Diversity. 3 credits.
301. Organizational Communication. 3 credits.
302. International/Intercultural Communication. 3 credits.
303. Community Relations. 3 credits.
304. Advertising and Society. 3 credits.
312. Communication Law. 3 credits.
428. History of American Journalism. 3 credits.
461. Political Communication. 3 credits.

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 Visuals 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 change. Covers issues such as emerging digital technologies, technological determinism, technology transfer, access, and cost.

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, goodness, 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 context 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.
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 course work for the undergraduate major.
5. Criteria used in admission decisions:
   a. Scores on the Graduate Record Examination General test,
   b. All grade point averages from previous undergraduate, post-baccalaureate and graduate studies,
   c. The extent and quality of previous clinical research, and service activities, and
   d. Quality of speaking, writing, and interpersonal skills.
6. 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: 501, 525, 531, 532, 533, 535, 536, 537, 538, 542, 552, 562, 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 CTL 400, Methods and Materials for Speech Clinicians, and CDHS 585, Practicum in the School Setting.
5. Graduate students already having a teaching credential with some other major must take CTL 400 and practicum in a school before being recommended for employment in a school.

Doctor of Philosophy—Speech and Hearing Science

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, and
   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 course work 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

501. Seminar in Speech-Language Pathology-Audiology. 1 to 3 credits Prerequisite: Consent of instructor. May be repeated as topics change.
501.01 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.
501.02 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.
501.03 A study of the application of current and emerging data in the area of clinical assessment and management of disorders of hearing 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. Culminates 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. Adult Neurogenic Communication Disorders, 3 credits. Prerequisites: CSD 422 and 231. Investigation of the nature, differential diagnosis, and treatment of neurologically-based speech and language disorders (aphasia, apraxia, dysarthria, cerebral palsy, and other disorders).
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.
535. Seminar in Speech and Hearing Science. 1 credit. Prerequisites: CSD 231 and CSD 235. A study of the application of instrumental analysis of speech production, transmission and perception to the diagnosis and treatment of communication impairments in children and adults.
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.
542. Child Neurogenic Communication Disorders. 2 credits. Prerequisite: CSD 452. An overview of cerebral palsy and other neuromuscular disorders including consideration of evaluation techniques and oral and non-speech/communicative system.
552. Motor Speech Disorders. 2 credits. Prerequisite: CSD 532. A study of the diagnoses and management of motor speech disorders, including dysarthria, apraxia, and dysphagia.
562. Augmentative/Alternative Communication. 3 credits. Prerequisites: CSD 452 and CSD 542. A study of the evaluation and application of manual and electronic communication aids for the severely handicapped.
583. Advanced Diagnostic Procedures. 3 credits. Prerequisites: CSD 383. Administration and interpretation of diagnostic instruments for evaluation of communication, language, social, and other disorders.
Practicum in the School Setting, 10 credits. Prerequisites: Graduate standing and consent of the department. Supervised practicum in a university-approved cooperating school.

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.

Research Design in Speech and Hearing Sciences, 3 credits. Prerequisites: Psych 541, Psych 543. The use of speech science instrumentation and data collection and analysis in human speech, language and hearing.

Research Problems in Speech-Language Pathology-Audiology, 1 to 3 credits. Prerequisite: consent of instructor. A. Speech-Language Pathology, B. Audiology.

Special Problems in Communication Disorders, 1 to 3 credits. Prerequisite: Consent of the instructor. An examination of special topics in communication disorders.

Independent Study, 2 credits.

Dissertation, 10 credits.

Language Development, 3 credits.

Language Disorders, 3 credits.

Introduction to Audiology, 3 credits.

Aural Rehabilitation, 3 credits.

Special Problems in Communication Disorders, 1 to 3 credits.

Computer Science

Professors Anderson, Jo, O’Neill (Chair), Panda (Graduate Director), Valeroso, Wiggers

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 Odegard School of Aerospace Sciences which provides unique opportunities for research by faculty and graduate students. There is especially strong interest within the department in the areas of artificial intelligence, compiler design, computer security, database, image processing, Internet applications, networks, object oriented design, operating systems, robotics, 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 CSAB/CSAC 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 165 and 166)
   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 536 Compiler Design
   - CSci 575 Analysis of Algorithms

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 Computing Track

(thesis option, 30 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.
3. The core and elective courses must include a 3-course specialization approved by the student’s Independent Study Advisor.
4. CSci 566 Applied Computing Project (3-6 credits), defined in consultation with the student’s Independent Study Advisor.
5. CSci 597 Independent Study (2 credits), a complete write-up of the Applied Computing Project.
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.
4. Successful completion of a written comprehensive examination on the areas covered in the core courses selected by the student, required only if the student receives a grade lower than “B” in core courses.
5. A final oral examination, which includes a defense of the thesis.

COURSES

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.

Topics in Computer Science, 1 to 3 credits. Prerequisite: Consent of instructor. Selected topics from current developments in Computer Science.

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.

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.

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.

Compiler Design, 3 credits. Prerequisite: CSci 465. Formal specification of programming languages, syntactic and semantic analysis, code generation and error handling.

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.

Advanced Artificial Intelligence, 3 credits. Prerequisite: CSci 365 or CSci 384. Study and application of topics drawn from two or more core areas of Artificial Intelligence: problem solving, knowledge representation, expert systems, learning, reasoning, planning, natural language processing, perception, and robotics.

Advanced Computer Graphics, 3 credits. Prerequisite: CSci 446. Math 265. An introduction to current technology and techniques for support of graphics. Included are geometric transformations of two- and three-dimensional displays, shadowing, windowing, clipping, fractals, animation, visualization, user interfaces, real-time graphics, and consideration of display devices.

Distributed Operating Systems, 3 credits. Prerequisite: CSci 370, CSci 451. A detailed study of the standard principles of operating systems in the context of distributed systems. Topics include: communications, synchronization, processes, file systems, memory management, mathematical modeling of operating systems, performance measurement and evaluation. Example distributed systems will be examined.

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.
### Counseling

**Professors:** Juntunen (Chair), Gray, Dauntry, Twohey, Whitcomb (Master’s Director), Wettersten, Houston

**Department Description**

The Department of Counseling 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 offered 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.

**Admission Requirements**

1. Twenty semester credits of course work in the behavioral sciences at the undergraduate level, which must include 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 based on achievement in undergraduate work, satisfactory performance on the General Record Exam General Test or the Miller Analogies Test, and favorable recommendations.

**Degree Requirements**

**Prerequisites:** 20 hours of Behavioral Sciences, including Abnormal Psychology, Statistics, and Developmental Psychology.

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<th>COMMUNITY AGENCY</th>
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<td><strong>501</strong> Ethics</td>
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<td><strong>533</strong> Couples</td>
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<td><strong>584</strong> Internship</td>
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<td><strong>997/8</strong> IS or Thesis</td>
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Plus 3 credits of elective, from the following:

| **529** Addiction | 2 cr |
| **565** Child & Adolescence | 3 cr |
| **565** Mid & Older Adult | 3 cr |
| **565** Special Topics | 1-3 cr |
| **585** Research Practicum | 1 cr |

| TOTAL | 48 (IS) or 50 (Thesis) |

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<td><strong>COUN 565</strong> Child and Adolescent Development</td>
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<td><strong>COUN 565</strong> Mid and Older Adult Dev.</td>
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| TOTAL | 56 (IS) or 58 (Thesis) |

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<td><strong>501</strong> Ethics</td>
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<td><strong>510</strong> Methods</td>
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<td><strong>455</strong> Advanced Software Engineering</td>
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<td><strong>456</strong> Computer Graphics</td>
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<td><strong>452</strong> Operating Systems II</td>
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<td><strong>455</strong> Database Management Systems</td>
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<td><strong>463</strong> Software Engineering</td>
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<td><strong>465</strong> Principles of Translation</td>
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<td><strong>491</strong> Seminars in Computer Science</td>
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**Total 56 (IS) or 50 (Thesis)**
Program Description

The program provides preparation at the Ph.D. Level for employment in a variety of 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 course work in general psychology, developmental psychology, abnormal psychology, experimental and research methods, and statistics.
3. Graduate Record Examination—General and Psychology Subtest.

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, Analytic and Psychology subtests of the Graduate Record Examination, references, vocational training and experiences, and career goals. 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, GRE-A 610, and GRE Psych 546. 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 course work 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

A cognate in the Department of Counseling, consisting of a minimum of 9 semester credits of counseling course work may be taken by master’s or doctoral students in related fields. Cognate course work 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

A minor in the Department of Counseling consisting of a minimum of 20 semester credits of counseling course work 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 Counseling faculty member on the Faculty Advisory Committee and should seek advice about appropriate courses and course sequences.

Department Evaluation of Students

The Counseling faculty conduct periodic reviews of students' progress in the MA and PhD programs, including their academic performance, counseling and psychosocial educational 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.

Courses

501. Ethics in Counseling. 2 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: CON501, 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 prepracticum experience. The didactic component introduces the basic interview 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, with 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 principles in counseling and counseling research. Topics include critical thinking, research design, data analysis, and the writing of research reports. Repeatable to 2 credits.

517. Psychological Testing. 3 credits. The application of principles of psychological measurement to selected instruments in the areas of intellectual functioning and aptitudes; educational and occupational achievements; career interests; and personality. Development of test interpretation skills.

518. Group Dynamics. 3 credits. Addresses the principles and practices of a diverse population are introduced.

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 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 theories and 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 practical exercises based on different theoretical models.

531. Psychology of Women, Gender and Development. 3 credits. This course presents current research and trends in developmental psychology, particularly theories pertaining to the psychological development of women and men. Issues such as abuse, ageism, depression, eating disorders, emotional experience and expression, heterosexism, feminism, and multiculturalism will be examined as related to the practice of psychology. Learning methods include writing, music, films, 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 in 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 interest inventories, 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 supervision techniques.

565. Professional Seminars. 1 to 3 credits. Prerequisite: consent of instructor. Seminars are designed to present current research and supplement course work in several areas. May be repeated up to eight credits. S/U grading only.

568. Personality Assessment. 3 credits. Prerequisite: COUN 517 or equivalent. Theory, research, evidence, and training in the administration, scoring, interpretation and use of personality assessment instruments. Issues of race, ethnicity, gender, age and disability in the use of these instruments is emphasized. 2-hour lab provides supervised practice in test administration and scoring.

569. Cognitive Assessment. 3 credits. Prerequisite: COUN 517 or equivalent. Theory, research evidence, and training in the administration, scoring, interpretation and use of cognitive assessment instruments. Issues of race, ethnicity, gender, age and disability in the use of these instruments is emphasized. A 2-hour lab provides supervised practice in test administration and scoring.

586. Counseling Practicum. 4 credits. Prerequisites: COUN 510. 10 completed COUN credits. Introduction to counseling practice. Emphasis on development, improvement, and evaluation of counseling relationships. Interview skills in supervised counseling practice in a variety of settings including elementary and secondary schools, industry, mental health settings, and other approved agencies. S/U grading only.

583. Field Work. 3 credits. Prerequisite: admission to doctoral program. Participation in the activities of a counseling agency. Continued development of counseling and consultation skills with individuals, couples, and groups. Participation in small group and individual supervision and in case conferences. S/U grading only.

584. Internship in Counseling. 3-4 credits (up to 8 total). Students in school counseling take 6 credits. Prerequisite: Counseling 580. Professional practice in counseling, assessment, consultation, teaching, or research in an approved agency. Supervision must meet criteria established by the department and the Graduate School. S/U grading only.

585. Counseling Psychology Research Practicum. 1-3 credits. This course involves student participation in one of several, topical research groups conducted by faculty on an ongoing basis. Groups will design and carry out research studies, and prepare manuscripts for publication or presentation. May be repeated up to 8 credits. S/U grading only.

586. Practicum in Supervision. 1-3 credits. Prerequisites: COUN 560. Supervised experience in providing supervision to counselors-in-training. Experience may be gained in supervising beginning students in role-played labs, live supervision in practicum, individual supervision, and small group supervision of interns. May be repeated up to 6 credits. S/U grading only.

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 6 credits. S/U grading only.

996. Continuing Enrollment. 1 to 12 credits.

997. Independent Study. 2 credits.

998. Thesis. 4 credits.

999. Dissertation. 1 to 12 credits.

EDUCATION

Professors Ahler, Barrentine, Baas, Bock, Bopry, Chalmers, Gershman, Greves, Guy, Helgeson, Holdman, Ingwalson, Landry, Laycock, Lemon, Olsen, Olson, Rice, Shaefner, Smart, Street
Uhlenberg, Walker, J. D. Williams, 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..........R. Landry
Educational Leadership........................................D. Lemon
Teaching and Learning...............................M. Shaefner/B. Uhlenberg

PROGRAM COORDINATORS

Early Childhood Education...............................G. Olsen
Educational Leadership........................................D. Lemon
Graduate programs in education at UND are accredited by the National Council for the Accreditation of Teacher Education (NCATE) through 2002 re-accreditation, and those leading to teacher certification 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 which inform all graduate programs for educators at UND advance development of expertise in the following areas.

1. Describing personal and possible educational practice orally and in writing.
2. Assessing the consequences of educational decisions for student and adult learners in schools.
3. Exploring the personal, historical, philosophical, sociological, anthropological, psychological, multicultural, and/or organizational origins of educational practices.
4. Interpreting current research and commentary on educational issues and recognizing sources of discrepancy among them.
5. Developing the habit of seeking and citing evidence in regard to educational decisions.
6. Acquiring knowledge, attitudes, and skills needed to practice in one or more of the areas of professional specialization.
7. Learning through dialogue, literature review, questioning, writing, observing, application of research methodology, and other scholarly means.
8. Distinguishing among educational practices on the basis of their contribution to the vision of teaching and learning espoused by the program.

PROGRAMS OFFERED

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<tr>
<th>Program</th>
<th>Degrees Available</th>
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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 certified educators. Both programs require completion of a final research paper or special project to culminate degree study. Refer to page 181 of this catalog for a discussion of M.Ed. requirements and to page 183 for a discussion of requirements for the Specialist Diploma.

The Master of Science (M.S.) degrees offered in education admit students who are certified 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 pages 185 and 186 of this Catalog for delineation of requirements for the Doctor of Education and Doctor of Philosophy degrees.

For a complete picture of each degree program, the student is advised to read sections discussing the requirements of the 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 AND REVIEW PROCESSES

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, domestic or foreign travel, and a liberal education. Each student brings a different mix of characteristics and strengths to graduate study.

In the admissions process, the applicant will develop a portfolio of materials which demonstrate the qualities of mind, levels of motivation and literacy, and quality of experience brought to study for an advanced degree. The portfolio will include the following items:

1. A completed Graduate School application form which includes a personal statement containing responses to the following three questions (no less than one typed page for each):
   a. Describe several personal and professional goals you would like to achieve in the next five years. Include in your description reasons why these goals are important to you.
   b. What are the characteristics, attitudes, values, and/or skills that you think will make you a good candidate for your chosen professional role?
   c. What have you already done professionally or personally of which you are proud?

2. Applicants for Master’s programs may supplement their portfolios with additional materials which represent their abilities (see 3 below).

3. Applicants for specialist or doctoral programs are expected to supplement their portfolios with additional materials which represent their abilities, such as:
   a. Any published writing, even if the material does not address educational issues;
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 determined by satisfactory completion of course work in the appropriate scholarly tool area(s) or by a proficiency examination. A minimum of five semester credits in appropriate course work 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 may be met by one of the following options:

Option 1: Quantitative 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.

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.

Option 3: Tests and measurements option: EFR 511 Curriculum Evaluation (3 semester credits), EFR 512 Educational Tests & Measurements (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 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 4-6 credits. Both the Master of Education and the Master of Science (non-thesis) degrees require a 2 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 and masters students in early childhood education, elementary education, special education, reading education, or general studies, who have chosen to do an Independent Study, 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 who choose the Final Project option meet the requirement for comprehensive examinations within the framework of the Final Project.

HIGHER EDUCATION

Courses focusing on Higher Education are offered by faculty in each of the three education departments. Offerings in higher education are coordinated by M. Olson. Work in Higher Education may be incorporated into the major of certain degree programs or comprise a cognate to support a graduate major.
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 Offered

500. Foundations of Educational Thought. 3 credits. A problem-centered class dialogue on those philosophical concepts of educational thought which have shaped the development of the learning experience.

501. Psychological Foundations of Education. 3 credits. A study of the learning process with secondary emphasis on how the learning process is affected by individual differences, growth and development, and personality. A background in undergraduate Educational Psychology is assumed.

502. Issues and Trends in Education. 3 credits. Prerequisite: EFR 500 or permission of the instructor. The object of this course is to discover the causative and evolutionary factors giving birth to contemporary issues and trends in education.

503. Historical Foundations of Education. 3 credits. An historical examination of the concepts of the meaning, nature, process, and purposes of education as evolved in different historical periods and societies with emphasis on the scholars, ideas and changing institutions.

504. Philosophical Foundations of Education. 3 credits. A study of the representative schools of philosophic thought which have structured major philosophies of education.

505. Social Foundations of Education. 3 credits. The study of schools and education in social context.

506. Multi-Cultural Education. 3 credits. Examination of the pluralistic character of American society and of the educational responses to this diversity.

507. Gender and Education. 3 credits. Gender and Education is a critical feminist analysis of the history, philosophy, theory, curriculum, and practice of education. We begin by examining gender as a social construct and its effects on boy and girl students in classrooms, peer groups, communities, and at home. Teachers' beliefs and practices are presented for analysis and current educational philosophy that integrates public and private spheres, productive and reproductive curriculum are evaluated. Post/modern and structuralist feminist theory and elements of critical theory are applied to the deconstruction of current narratives perpetuated in classroom practices.

508. Anthropological Foundations of Education. 3 credits. Students will examine the convergence of anthropology and education through an analysis of education as cultural transmission and a review of enculturation and acculturation processes in traditional and modern societies.

509. Introduction to Education Research. 3 credits. An introduction to the research methodologies used to study education. Special emphasis is on statistical, experimental and quantitative as well as naturalistic and qualitative 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. A study of the theoretical models of curriculum 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 515 or consent of the instructor. Application and integration of measurement theory in a research framework; evaluation of cognitive and affective scales with emphasis on the statistical and psychometric properties of the scales.

513. Computer Applications in Education. 2 credits. Prerequisites: EFR 515 (or concurrent) or consent of the instructor; basic skills in programming. A study of large scale computer system applications, usually involving relatively large data sets on mainframe (or other computer sharing device) applications including data file management. Becoming familiar with existing computer sharing systems-language is necessary.

514. Small System Computer Applications in Education. 3 credits. A study of small computer system applications to education, current and potential, including computer-assisted instruction, models, the computer as an educational tool, design factors, and the impact of computing on the educational and social environment.

515. Statistics I. 3 credits. An in-depth study of inferential statistics with primary emphasis on analysis of variance models, multiple regression techniques, analysis of covariance and other higher-order statistical procedures.

516. Statistics II. 3 credits. An in-depth study of inferential statistics with primary emphasis on analysis of variance models, multiple regression techniques, analysis of covariance and other higher-order statistical procedures.

517. Advanced Research Methodologies. 3 credits. Both qualitative and quantitative aspects of research are considered for a variety of topics, including ethics in research, use of data banks, Q-methodology, survey research, Bayesian concepts, critical theory, longitudinal research and research consultation. Previous or concurrent involvement in research is highly desirable.

518. Multivariate Analysis. 3 credits. Multiple regression in generalized problem solving; discriminant analysis, factor analysis, multivariate analysis, canonical analysis, judgment analysis, and multivariate analysis of covariance. Students are encouraged to analyze their own data with multiple methods including student-generated computer applications.

519. Research Seminar. 1 to 4 credits. Experimental Design—An in-depth treatment of analysis of variance designs including factorial designs, treatment by subjects designs, groups within treatment designs, latin squares, higher dimensional designs, mixed effect designs, analysis of covariance, and trend analysis. Emphasis is placed on underlying linear models. Other seminars are held on specific research topics, particularly research proposals. May be repeated.

520. Advanced Qualitative Research Methods. 3 credits. The study of philosophy, principles and practices as the field of non-statistical inquiry. Examines several case studies of qualitative research. Students are required to do a limited ethnographic study in an educational setting.

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 Education Research. 1 to 8 credits. Prerequisites: Appropriate foundational, cognate, and major area course work and consent of the advisor and instructor. This is a culminating experience primarily for sixth year and Doctoral students. 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.
M.S. degree program. Upon completion of the M.S. degree, a student probably will not have completed the requirements for administrative certification in North Dakota.

Specialist Diploma

The Specialist Diploma, available at UND only in Educational Leadership, is designed for students preparing for school administrative positions. This course of study is usually considered to be a terminal program of advanced preparation for professional practice. Upon completion of the Specialist Diploma, a student generally will have completed the requirements for administrative certification 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, as well as persons preparing for positions of higher education in higher education institutions. Upon completion of the Ed.D. degree, a student generally will have completed the requirements for administrative certification 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 to knowledge in the field. It is generally expected that the Ph.D. dissertation will be publishable in the literature of educational leadership. School administrators do not generally seek this degree. Those who aspire to leadership positions in the academic side of institutions of higher education, in government agencies, or in other educational policy organizations are more typically served by this degree.

Doctoral Residence

Beginning in 1999, doctoral students are admitted to a cohort-based program. Course work in the first cycle is delivered over a three-year period. Participation in this program meets the residence requirement of the Graduate School. Courses are delivered in compressed blocks of a day and one-half to two days every three to four weeks. Persons interested in applying to this program should contact the Department for more detailed information. In unusual circumstances, a very limited number of doctoral students may be allowed to pursue an accelerated course of study by being full-time, on-campus students.

For information about admission, 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 computers as a tool. Upon completion of the Ed.D. degree, a student generally will have completed the requirements for administrative certification including those required for the position of school superintendent in North Dakota.

513. Curriculum, Instruction, and Learning Theory. 4 credits. This course provides school leaders the ability to understand main curriculum design models, interpret school district curricula, initiate needs analyses, plan and implement with staff a framework for instruction, align curricula 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. 4 credits. This course provides school leaders with preparation in skills for instructional improvement, working with faculty and staff to identify professional needs. Classes are designed for in-depth study and practice planning, organizing, and facilitating programs that improve faculty and staff effectiveness and are consistent with institutional goals and needs; supervising individuals and groups; providing feedback on performance; arranging for remedial assistance; engaging faculty and others to plan and participate in recruitment and development activities; and initiating self-development.

515. Education Law and Organizational Structure of Schools. 3 credits. This course is designed as a beginning law course for school 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.

516. Policy and Educational Finance. 2 credits. Includes such topics as the organization of and responsibility for education in the United States at the federal, state, and local levels; basic administrative theories, processes, and techniques; and major areas of concern in the operation and administration of educational systems.

517. Social, Cultural, Political, and Community Dimensions of Schools. 4 credits. This course provides school leaders with an understanding of the historical, philosophical, ethical, social, and economic influences affecting educational leaders and the degree that they can apply their understandings to professional decisions. Students are expected to apply political concepts and strategies and approaches to collaboration in involving the community in decision making, building community support for integrating health and social services in support of students, and developing community support for school priorities. Throughout the course, students’ work will be expected to manifest a sensitivity to issues of diversity in a pluralistic society.

520. Middle School Principalship. 2 credits. Leadership responsibilities and techniques for middle school principals. Includes topics such as instructional improvement, administrator-staff-student relationships, communication, public relations, planning, and programming at the building level in middle schools.

521. Elementary School Principalship. 2 credits. Leadership responsibilities and techniques for elementary principals. Includes topics such as instructional improvement, administrator-staff-student relationships, communication, public relations, planning, and programming at the building level in elementary schools.

522. Secondary School Principalship. 2 credits. Leadership responsibilities and techniques for secondary school principals. Includes topics such as instructional improvement, administrator-staff-student relationships, communication, public relations, planning, and programming at the building level in junior and senior high schools.

523. The Educational Plant. 2 credits. Planning, construction, modification, and maintenance of school buildings. Includes techniques for developing and using the building, program, and community survey.

524. Educational Personnel Administration. 2 credits. Study of selection, assignment, evaluation, development, and release practices for certified and non-certified school personnel; salary and contract administration in schools.

526. Business Management in Education. 2 credits. Study of the business function in educational organizations with emphasis on budget development and administration, accounting, purchasing, risk management, support services, and capital outlay.

527. Legal Issues in Education. 3 credits. Study of the legal issues affecting educational organizations with emphasis on state and federal relationships to local institutions, school boards and other governing bodies, contracts, teachers’ and students’ rights, and tort liability of educational organizations and their officers. Consideration is given to legal research and policy analysis.

529. Special Education Law. 3 credits. A course designed to give participants a working knowledge of the legislative, judicial, and administrative changes which have revamped the areas of teaching and administering special education since 1974. It will provide information useful to administrators, practitioners, attorneys, parents, and advocates on topics including: student records, discipline, related services, due process, least restrictive environment, and appropriate education.

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 others; and the 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, grievance procedures, and results of the negotiations.

41. 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. Curricular in Higher Education, 2 credits. A study of processes for planning, implementing, and evaluating curriculum within institutions of higher education. Topics will include historical perspectives on curriculum in higher education, governance systems related to curriculum development and adoption, and issues of current interest and concern.

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 instruction, program evaluation, assessment, planning, faculty workload and evaluation, and the profession of administration.

552. Higher Education Law, 2 credits. An overview of the legal issues that confront college and university personnel. Pertinent federal and state statutes as well as case law will be used to instruct about legal rights and responsibilities of university 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 relationship 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 examined.

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.

559. Seminar in Higher Education Leadership, 1 to 4 credits. 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 school activity, advisory, 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 resources; and generating, analyzing, and selecting alternatives. Processes and techniques in planning will be emphasized.

573. Administration and Organizational Behavior I, 3 credits. A study and critique of selected theories and research in administration and organizational behavior, including topics such as leadership; formal and informal structure; communication; change and intervention; motivation and morale; interpersonal relations and conflict management; small-group processes; and personality, values, and ethics.

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 public policy.

579. Special Topics in Educational Leadership, 1 to 4 credits. Prerequisite: Consent of instructor. 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 course work 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.

Programs Offered

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See pages 208 through 210 under Programs in Education 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, Head Start programs, child development and child care centers, and other programs related to the education of children.

Admission Requirements

An undergraduate degree in early childhood education, child development, elementary education, or a related field. Refer to page 173 of this catalog for additional information on admission requirements and application procedures.

Degree Requirements

A detailed description of the M.S. degree can be found on page 180. 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:

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</tr>
<tr>
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<td>3-5</td>
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<tr>
<td>or (non-thesis option)</td>
<td>9</td>
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<tr>
<td>T&amp;L 997</td>
<td>Independent Study (non-thesis option)</td>
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Department of Teaching and Learning (T&L)

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.

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<td>or (non-thesis option)</td>
<td>9</td>
</tr>
<tr>
<td>T&amp;L 997</td>
<td>Independent Study (non-thesis option)</td>
</tr>
<tr>
<td>or T&amp;L 998</td>
<td>Thesis (thesis option)</td>
</tr>
</tbody>
</table>
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.

2. Teacher Licensure or a baccalaureate degree for the M.S.

Refer to page 173 of this catalog for additional information on admission requirements and application procedures.

Degree Requirements

A detailed description of the M.Ed. degree may be found on page 181; a detailed description of the M.S. degree can be found on page 210. Scholarly tool requirements are described on page 210.

Master of Education

Licensed persons are eligible for this degree. The major portion of the program includes course work 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 an independent study 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 course work and allows a maximum two credits of readings.

Track II, available only in the non-thesis option, provides opportunity for non-certified persons to study Elementary Education at the graduate level. Track II requires a minimum of six credits of course work in Foundations of Education.

Sample Program of Study, M.Ed., Elementary

<table>
<thead>
<tr>
<th>Major</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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></td>
</tr>
<tr>
<td>T&amp;L 990</td>
<td>ST: Action Research</td>
</tr>
<tr>
<td>T&amp;L 997</td>
<td>Independent Study</td>
</tr>
</tbody>
</table>

Cognate

T&L 524 | Reading in the Content Areas | 2 |
T&L 534/583 | Basic Reading Diagnosis & Remediation/Clinic | 4 |

Educational Foundations

EFR 500 | Foundations of Educational Thought | 3 |
EFR 502 | Issues and Trends in Education | 3 |

Sample Program of Study, M.S., Elementary

<table>
<thead>
<tr>
<th>Major</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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 (non-thesis)</td>
<td></td>
</tr>
<tr>
<td>Electives (thesis)</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 997</td>
<td>Independent Study (Track I only)</td>
</tr>
<tr>
<td>or T&amp;L 998</td>
<td>Thesis (Track I only)</td>
</tr>
</tbody>
</table>

Scholarly Tools

Track I, only

EFR 509 | Introduction to Educational Research | 3 |
T&L 990 | ST: Action Research | 3 |

Educational Foundations

Track II, only

EFR 500 | Foundations of Educational Thought | 3 |
EFR 506 | Multicultural Education | 3 |

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 does not require, or lead to, teacher licensure.

For licensed teachers the major portion of the program of study must include 8 credits in foundations, 6 credits in curriculum and 5 credits in scholarly tools. For those who are not licensed teachers, the major portion of the program of study must include 8 credits in foundations, 4 credits in curriculum and 5 credits in scholarly tools.

Admission Requirements

1. Teacher Licensure

or

2. Minimum of 8 credit hours of social sciences or humanities.

Degree Requirements (for certified teachers)

1. Six (6) credits in foundations.
2. Six (6) credits in curriculum.
3. Five (5) credits in scholarly tools.

Degree Requirements (for those not certified)

1. Eight (8) credits in foundations.
2. Four (4) credits in curriculum.
3. Five (5) credits in scholarly tools.
The minor or cognate for this degree must include academic course work which provides broad support for the major.

### 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.

   - or

2. For the M.S., licensure (early childhood, elementary, middle or secondary), or a baccalaureate degree in another field of study.

3. To meet requirements for the North Dakota Reading Credential, students pursuing the M.Ed. or M.S. must be licensed teachers with three years of classroom teaching experience.

Refer to page 173 of this catalog for additional information on application procedures.

#### Degree Requirements

The M.Ed. degree in Reading Education requires course work 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 an independent study 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 I requires a minimum of five credits of scholarly tool course work 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 course work in Foundations of Education.

#### Sample Program of Study, M.Ed., Reading

<table>
<thead>
<tr>
<th>Major and Cognate</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 524 Reading in the Content Area</td>
<td>2</td>
</tr>
<tr>
<td>T&amp;L 530 Foundations of Reading Instruction</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 534/583 Basic Reading Diagnosis &amp; Remediation/Clinic</td>
<td>4</td>
</tr>
<tr>
<td>T&amp;L 536 Teaching &amp; Supervision of Elementary Language Arts</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 590 Writing in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 997 Independent Study</td>
<td>2</td>
</tr>
<tr>
<td>Cognate</td>
<td></td>
</tr>
<tr>
<td>T&amp;L 523 Home School Relations</td>
<td>3</td>
</tr>
<tr>
<td>T&amp;L 590 Action Research</td>
<td>3</td>
</tr>
<tr>
<td>Educational Foundations</td>
<td></td>
</tr>
<tr>
<td>EFR 500 Foundations of Educational Thought</td>
<td>3</td>
</tr>
<tr>
<td>EFR 506 Multicultural Education</td>
<td>3</td>
</tr>
</tbody>
</table>

### Special Education

#### Program Description

The graduate program in Special Education prepares teachers and consultants to work with individuals in one or more of the following areas: early childhood special needs, emotional disturbance, mental disabilities, specific learning disabilities and visual impairments. Students may complete course work to satisfy North Dakota’s requirements for a credential in Early Childhood Special Education, Visual Impairment, or the Educational Strategist with an endorsement in one or more of these disability areas: emotional disturbance, learning disabilities, mental retardation. Detailed descriptions of all programs including prerequisites and course sequences are available in the Special Education Office Room 303, Education Building.

Teachers certified in Elementary Education, Middle School Education, or Secondary Education may pursue the Master of Education or the Master of Science degree. Individuals who will complete certification in Elementary, Middle, or Secondary Education by the time they complete their master’s degree in Special Education may also pursue the Master of Education or the Master of Science degree. Non-certified persons may only pursue the Master of Science degree. Certified individuals are eligible for employment in public school settings as well as in various agencies serving individuals with disabilities. Non-certified individuals are eligible for agency employment but not for public school positions.

#### Admission Requirements

1. Baccalaureate degree in education or in areas such as social work, communication disorders, nursing, or physical therapy.

2. For students with undergraduate degrees in other than education—
   a. Twelve (12) semester credits of undergraduate teacher education.
   b. Eight (8) semester credits of undergraduate study in social science or selected humanities prior to taking graduate level study in education.

#### Degree Requirements

The Master of Science (M.S.) degree is available in two tracks. The first track, with either a thesis or non-thesis option, is open to professional educators (certified) or non-certified persons who wish to follow a research-oriented program of study, and requires the inclusion of a minimum of five credits of scholarly tool course work (maximum of two credits of readings) in the program of study. The second track, available only in the non-thesis option, provides opportunity for non-certified persons to study Special Education at the graduate level; and
requires the inclusion of at least six credits of course work in educational foundations. A detailed description of the M.S. degree requirements may be found on page 180; a detailed description of the Master of Education (M.Ed.) degree can be found on page 181. The scholarly tool requirements are described on page 210. Applicants should refer to page 173 and 209 for application procedures.

A doctoral degree in Teaching and Learning is available with a concentration in Special Education. Interested persons are referred to page 216 of this catalog.

Individuals interested in Special Education Administration may pursue this area of study through a Master of Education (M.Ed.), a Master of Science (M.S.), a Specialist Diploma, or a Doctorate program. At the master’s level for those pursuing special education administration, the major should be Special Education and the cognate or minor would be Educational Administration. At the Specialist or Doctoral level, the major would be Educational Administration, while the minor or cognate would be Special Education.

Teaching and Learning
(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 government. Four major options are available in both degree programs: Elementary Education/Child Study, Secondary/Higher Education, Special Education, and Research Methodologies. 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.) are stated on p. 186 of this catalog, and requirements for the Doctor of Education (Ed.D.) are stated on p. 185.

Admission Requirements

See Graduate School requirements (p. 173) and Education requirements (p. 208).

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 secondary/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 credit hours for the degree, in elementary education/child study, secondary/higher education, special education, or research methodologies. The major coursework includes a dissertation of at least 10 credit hours.

2. A minor or cognate in a supporting area of at least 12 credit hours.

3. A minimum of six credit hours in the Foundations of Education.

4. A minimum of 10 credit hours of scholarly tools. Scholarly tools options for doctoral students in education are described on page 210.

Three residency options are available to doctoral students in the Teaching and Learning programs.

1. Students will complete a residency while enrolled in a minimum of 12 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 an August doctoral seminar during their residency or at another time in the program.

2. Students will complete a residency while enrolled in a minimum of 8 semester hours of credit during each of three consecutive summer sessions and in a minimum of two August doctoral seminars following their first and second or third summers in residence.

3. Students will complete a residency over a period of three consecutive years of continuous enrollment in a minimum of 36 semester hours of credit to include a minimum of two August doctoral seminars during the period of residency. Students in this option are encouraged but not required, to enroll in one common course per year to be determined by each first year cohort at the August doctoral seminar.

The definition of residency of the UND Graduate School appears on page 177. Residency policies of the program are available on request.

Doctor of Education

The program of study shall include the following:

1. A major area consisting of a minimum of 58 credit hours in elementary education/child study, secondary/higher education, special education, or research methodologies. The major coursework includes a dissertation of 10 credit hours.

2. A minor or cognate in a supporting area of at least 12 credit hours.

3. A minimum of 12 credit hours in the Foundations of Education.

4. A minimum of six credit hours of scholarly tools. Scholarly tools options for doctoral students in education are described on page 210.

Three residency options are available to doctoral students in the Teaching and Learning programs.

1. Students will complete a residency while enrolled in a minimum of 12 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 an August doctoral seminar during their residency or at another time in the program.

2. Students will complete a residency while enrolled in a minimum of 8 semester hours of credit during each of three consecutive summer sessions and in a minimum of two August doctoral seminars following their first and second or third summers in residence.

3. Students will complete a residency over a period of three consecutive years of continuous enrollment in a minimum of 36 semester hours of credit to include a minimum of two August doctoral seminars during the period of residency. Students in this option are encouraged but not required, to enroll in one common course per year to be determined by each first year cohort at the August doctoral seminar.

The definition of residency of the UND Graduate School appears on page 177. Residency policies of the program are available on request.

Major Options

Elementary/Child Study

The Elementary Study/Child Study option focuses on teaching and learning, the development of curriculum, and the study of children and young adolescents. The major area includes one to three components which focus on aspects of elementary or middle level education or the study of children, such as language and literacy learning, the teaching of science, personalizing learning experiences, or human relations education.

Secondary/Higher Education

The Secondary/Higher Education option focuses on issues of teaching and learning of older adolescents and adult learners with focus on the pedagogy of a particular content field. Half of the work of the major is devoted to study of the academic discipline of the student and
half to the study of education. Core requirements for secondary and higher education students differ and include the following courses:

Secondary Education

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 540 Theories and Philosophies of Curriculum</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 542 Improvement of Instruction in the Secondary School</td>
<td>...</td>
</tr>
</tbody>
</table>

Recommended Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 533 Reading in the Secondary School</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 538 Supervision of Student Teaching</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 571 Teaching the Special Child</td>
<td>...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFR 506 Multicultural Education</td>
<td>...</td>
</tr>
<tr>
<td>EFR 507 Gender and Education</td>
<td>...</td>
</tr>
</tbody>
</table>

Higher Education

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 570 History of Higher Education in the U.S.</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 539 College Teaching</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 545 Adult Learners</td>
<td>...</td>
</tr>
</tbody>
</table>

Recommended Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 590 Higher Education Curriculum</td>
<td>...</td>
</tr>
<tr>
<td>EFR 552 Higher Education Law</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 571 Inclusive Methods</td>
<td>...</td>
</tr>
<tr>
<td>EFR 506 Multicultural Education</td>
<td>...</td>
</tr>
<tr>
<td>EFR 507 Gender and Education</td>
<td>...</td>
</tr>
</tbody>
</table>

Ph.D. students entering doctoral study with a master’s degree in the content field and without previous background in the study of education will complete a major concentrated entirely on the study of education and a minor or cognate of at least 20 credit hours in the content field.

Special Education

The special education option prepares special educators and persons in related human service disciplines for educational leadership as teacher educators, special service coordinators, consultants, and student advocates. Special education programs offered in the College of Education and Human Development address the needs of students identified as mentally disabled, learning disabled, emotionally disturbed, visually impaired, or having early childhood special needs. The special education option includes specified advanced course work in special education and work in one or more of the areas listed above. The student is expected to include in the program the following courses or their equivalents.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;L 551 Advanced Assessment/Special Needs Students</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 552 Inclusive Methods</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 553 Collaborative Relationships</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L 576 Behavior Management for Special Needs Students</td>
<td>...</td>
</tr>
<tr>
<td>T&amp;L549 Seminar in Special Education</td>
<td>...</td>
</tr>
</tbody>
</table>

Research Methodologies

The research methodologies option focuses on the study of quantitative and qualitative research in education. Students are prepared to become education researchers or teachers of research methodologies in education and related fields. In this major, half of the courses consist of work in research methodologies and half, of selected work in the study of education.

Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>500. Education of the Visually Impaired</td>
<td>...</td>
</tr>
<tr>
<td>501. Diseases and Function of the Eye</td>
<td>...</td>
</tr>
<tr>
<td>502. Braille Reading and Writing</td>
<td>...</td>
</tr>
<tr>
<td>503. Orientation and Mobility/Visually Impaired</td>
<td>...</td>
</tr>
<tr>
<td>504. Communication Media and Methods/Visually Impaired</td>
<td>...</td>
</tr>
</tbody>
</table>

Prerequisite: Consent of instructor. This course provides an overview of the communication devices and adaptive technology used by the visually disabled. Students learn to read and write the braille codes for mathematics and music, do basic calculations on the abacus, braille and talking calculator and gain familiarity with computers and software currently used in the field.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>505. Law Vision Assessment and Remediation</td>
<td>...</td>
</tr>
</tbody>
</table>

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 adaptions needed in the educational settings. Optical and non-optical aids are compared and evaluated.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>510. Early Intervention for Children with Special Needs</td>
<td>...</td>
</tr>
</tbody>
</table>

An introduction to the field of Early Childhood Special Education, primarily for students interested in entering the field. Issues such as program design, parent involvement, identification, infant education, and effects of disabilities will be covered.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>511. Identification and Assessment of Young Children with Special Needs</td>
<td>...</td>
</tr>
</tbody>
</table>

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 preschoolears.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>512. Methods and Materials for Preschool Children with Special Needs</td>
<td>...</td>
</tr>
</tbody>
</table>

A comprehensive study of curricula, program development and intervention strategies for disabled children aged 3 to 6.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>513. Working with Families of Young Children with Special Needs</td>
<td>...</td>
</tr>
</tbody>
</table>

This course provides initial study of the impact of a child with special needs on the family. An overview of family systems theory and social network theory is included as they relate to families of children with special needs. Emphasis is placed on the development and implementation of family-centered services in early intervention programs.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>514. Intervention Strategies with Infants and Toddlers</td>
<td>...</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>517. Creative Expression in the Elementary School</td>
<td>...</td>
</tr>
</tbody>
</table>

Content, methods, and theories in the field of writing instruction at the elementary school level.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>518. Science in the Elementary School</td>
<td>...</td>
</tr>
</tbody>
</table>

A study of current trends and practices associated with teaching and assessing inquiry-based science in elementary classrooms.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>519. Social Studies in the Elementary School</td>
<td>...</td>
</tr>
</tbody>
</table>

Content, methods, curricula, organization, and curriculum problems in the field of social studies in the elementary school levels.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>520. Curriculum and Instruction in Elementary Schools</td>
<td>...</td>
</tr>
</tbody>
</table>

A study of processes for planning, implementing, and evaluating curriculum and improving instruction in elementary schools.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>522. Mathematics in the Elementary School</td>
<td>...</td>
</tr>
</tbody>
</table>

A study of current trends and practices associated with teaching and assessing inquiry-based math in elementary classrooms.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>523. Home-School Relations</td>
<td>...</td>
</tr>
</tbody>
</table>

Prerequisite: Classroom experience or permission of instructor. A study of the experience of parenting and the needs of parents and how these relate to the establishment of working relationships between parents and teachers; an introduction to conferencing skills and basic counseling skills.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>524. Reading in the Content Areas</td>
<td>...</td>
</tr>
</tbody>
</table>

Pre- or corequisite: CTL 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>525. Play in Development and Early Childhood Education</td>
<td>...</td>
</tr>
</tbody>
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The play of children has long been viewed as essential to developmental processes. In addition, education has recognized the need to incorporate play into programs. This course explores the relationship of play to development (cognitive, physical and emotional), and the way in which play has been incorporated in programmatic settings.

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<th>Course</th>
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<tr>
<td>526. Creative Foundations in Early Childhood Education</td>
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This course examines the historical, philosophical, cultural, race, class, and gender influences on curriculum in early childhood, including the philosophy and mission of the Department of Teaching and Learning.

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<th>Course</th>
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<tr>
<td>529. Language Development in Children</td>
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This course provides foundational information and a sense of appreciation for language, and information necessary for the development of language rich interactions with young children.

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<th>Course</th>
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<tr>
<td>530. Foundations of Reading Instruction</td>
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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 each supports.

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<th>Course</th>
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<tr>
<td>531. Teaching of Reading in the Primary Grades</td>
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Pre- or corequisite: TL 530. A study of the reading process in the primary grades including essential factors of readiness for learning to read, teaching techniques, and approaches to beginning reading instruction.

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<th>Course</th>
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<tr>
<td>532. Teaching of Reading in the Intermediate Grades</td>
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Pre- or corequisite: TL 530. A study of the reading process in the intermediate grades with emphasis on reading as a tool for learning.

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<th>Course</th>
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<tr>
<td>533. Reading in the Secondary School</td>
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Development of reading-study skills in the content subject areas and reading skill development.
534. Basic Reading Diagnosis and Remediation. 2 credits. Prerequisite: TL 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: TL 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: TL 530. Studies the objectives of the elementary language arts program, methods of instruction, and recent curricular 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. 3 credits. A study of processes for planning and implementing curriculum.


543. The Junior High School. 2 credits. Philosophy, special functions, organization, and administration of the American Junior High School.

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.

547. Young Children’s Thinking. 2 credits. Students in this course will study the thinking of young children, ages 0-8, 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.

548. Observational Research in Child/Case Studies. 3 credits. Students in this course will be introduced to several methods of observation used in case studies, and in particular, child studies. Issues that surround the use of observation in case study research involving the observation of children will be examined, especially as these issues relate to participant-observation of teacher-researchers.

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.

550. Introduction to Learning and Behavior Problems. 3 credits. Characteristics of gifted and talented youth who are learning disabled and/or emotionally disturbed, and the causes and effects of these disabilities. May be repeated.

551. Advanced Assessment/Special Needs Students. 3 credits. 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 participation included. Prerequisite: TL 423.

552. Inclusive Methods. 2 credits. The study of a variety of methods and materials for teaching children and youth with learning and behavior problems in the general education classroom.

553. Collaborative Relationships. 2 credits. A course appropriate for anyone working with parents, general educators, special educators, paraprofessionals, related service personnel, and administrators. 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, and (7) supervisory skills.

554. Advanced Methods: LD. 2 credits. The study of specific strategies, methods, and materials for working with students with learning disabilities.

555. Advanced Methods: ED. 2 credits. The study of specific strategies, methods, and materials for working with students with emotional/behavioral disorders.

556. Advanced Methods: Mental Retardation. 3 credits. Prerequisites: Senior Status or Graduate Status. This course is a master’s 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.

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. 3 credits. Practices, issues, and trends in the design and implementation of programs for the preparation and development of K-12 teachers.

578. Behavior Management for Special Needs Students. 2 credits. An introductory course investigating the theories and philosophies that deal with changing behavior patterns in individuals, groups and societies. Primary focus will be on classroom management and techniques with special needs students.

580. Practicum in School Problems. 1 to 4 credits. Prerequisites: Appropriate foundational and major 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. 582. 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 clinic practice in diagnosis of reading difficulties, report writing, and tutoring. Includes school consultations.

584. Internship in Education. 1 to 8 credits. Prerequisites: Appropriate foundational, cognate, and major area course work 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.

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.

593. Independent Projects. 1-4 credits.

596. Individual Research in Education. 1 to 4 credits. Prerequisites: Consent of advisor and instructor. May be repeated.

421. Transition to Adult Life. 3 credits.

422. Education of Gifted and Talented. 2 credits.

423. Assessment Program Planning/Special Needs Students. 3 credits.

454. 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 Khalifa, Miles, Salehfar, Schultz

Program Description

The UND Department of Electrical Engineering offers graduate programs leading to the Master of Engineering and the Master of Science degrees. The department maintains strong research emphases in systems engineering, including controls, power systems, signals and systems, reliability, artificial intelligence, computer hardware, applied electromagnetics, imaging, and robotics. The M.S. degree is offered under both the thesis and non-thesis options. The department also participates in a schoolwide Ph.D. program in Energy Engineering. 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 opportunities for professional growth. The programs provide graduates with the knowledge, aptitudes, and attitudes, which prepare them for corporate and government positions and for further opportunities in research and development.

Admission Requirements

Master of Science

1. B.S. degree in Electrical Engineering from an ABET-accredited program. Students holding a B.S. degree in a science field, (e.g., physics, computer science, mathematics) may be admitted to Provisional or Qualified status until undergraduate deficiencies in electrical engineering have been satisfied.

2. An overall graduate GPA of at least 2.75 or a GPA of at least 3.00 for the last two years.

Master of Engineering

1. B.S. degree in Electrical 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.

Applicants for admission to any of the programs for graduate studies in Electrical Engineering from non-ABET-accredited universitie/programs must submit scores from the General Test of the Graduate Record Examination.
Degree Requirements

1. Possible concentrations or combinations: a) Systems, including circuits, communications, control, signal processing, computer, microprocessors, and power; b) Electromechanical energy conversion, machine design and power electronics and; c) Applied electromagnetics, with an emphasis on high-frequency circuit design.

2. Minors and cognates are encouraged in areas such as mathematics, physics, engineering, computer science, entrepreneurship, and/or related areas.

3. The Master of Engineering program requires one-third engineering design, and may include another one-third advanced engineering, and one-third in related areas.

Courses


504. Statistical Communications Theory and Signal Processing II. 3 credits.

505. Control Systems I. 3 credits. Prerequisite: EE 405. Advanced topics in control systems, including nonlinear systems, robust control, optimal control, and pole placement techniques; select topis 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.

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. Semiconductor Circuits. 3 credits. Prerequisite: EE 421 or consent of instructor. The use and application of semiconductor device models to the analysis and design of semiconductor device circuits.

511. Industrial Electronics. 3 credits. Prerequisite: EE 321. Application methods and problems of electronic circuits in the manufacturing and power industries.

519. Digital Computer Logic. 3 credits. Prerequisites: EE 201 and EE 451. 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.

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.

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 students 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.

421. 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.
5. A written comprehensive examination taken when at least 24 credits of doctoral course work is completed or after completing 54 credits of course work past the baccalaureate degree before being advanced to candidacy (Note: the comprehensive exam will be administered by the EGPC). This examination will be based significantly on the core of the program (a minimum of 15 credit hours of course work in support of the doctoral research and EnE 501 and 502).

6. Each student must present to his or her advisory committee an annual oral progress report describing their research progress over the previous year. One of these presentations, to be given NO LATER than the same academic year in which the written comprehensive exam is taken, will consist of an oral examination that includes a presentation of the dissertation research plan. The oral exam must be completed at least 1 year prior to the expected completion of the Ph.D. requirements.

7. Candidates for the degree must complete an original basic research investigation. Each candidate will complete the research investigation to the satisfaction of the research advisor and the advisory committee, and will prepare a dissertation covering the research. The candidate will present and defend the dissertation at the final oral examination.

Courses

501. Energy, Resources, 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 select readings.

502. Alternative Energy Systems. 3 credits. Prerequisites: 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.


590. Special Topics in Energy Engineering. 1 to 6 credits. Prerequisite: Consent of instructor. Investigation of special topics in energy engineering dictated by student and faculty interests. These topics must include 3 credits of alternative energy sources/systems. May be repeated up to a total of 9 credits.

599. Doctoral Research. 1 to 15 credits repeatable to 30.

English Language and Literature

Professors Anderegg (Graduate Director), Beard, Carson, Coleman, Dixon, Donaldson, Hampsten, Huang, Koprince, Lewis (Chair), Marshall, McKenzie, J. Meek, M. Meek, O'Donnell, Rankin, J. Robison, Wiener

Program Description

The Department offers the degrees of Master of Arts, and Doctor of Philosophy.

The University of North Dakota Department of English offers a varied program of studies in English and American literature, writing, and the English language. The academic atmosphere is intimate, class size for graduate courses is small, and students are encouraged to work closely with members of the graduate faculty. The curriculum varies from year to year and includes courses in genres, periods, specific authors, critical theory, rhetoric/composition, interdisciplinary study, creative writing, cinema/film theory, linguistics, and research methods. Faculty in the Department also work in interdisciplinary areas such as American Studies, Peace Studies, Composition Studies, American Indian Studies, and Women Studies. The Department works closely with the University’s College of Education and Human Development in the area of English Education. In all areas of work, students are encouraged to utilize a variety of critical and theoretical approaches.

The Department sponsors an annual week-long writers’ conference that gives graduate students a chance to hear contemporary writers read their work and discuss the writing process. Recent visitors have been Jonis Agee, Czeslaw Milosz, Louise Erdich, Larry McMurtry, Leslie Silko, James Welch, Reginald McKnight, Luisa Valenzuela, Tobias Wolff, and Tim O’Brien.

Admission Requirements

Applications for admission must be completed by March 1 for full consideration and Teaching Assistantships.

Master of Arts

1. Twenty semester credits of English beyond the communication requirement with a 3.00 grade point average or better.

2. Undergraduate work in at least one language other than English equivalent to the first two college-level years or by demonstrating (by Educational Testing Service or by Languages Department examination) a reading knowledge of one language other than English or the satisfactory completion of two semesters each of two languages other than English. In some cases, students may be admitted without the language requirement and may complete it as part of the M.A. program.

3. A writing sample of 10-15 pages on topics or in modes appropriate to the proposed program of study (submitted directly to the department).

4. Graduate Record Examination General Test required. Literature in English Advanced Test is recommended.

Doctor of Philosophy

1. The requirements listed above for the Master of Arts.

2. Ordinarily a master’s degree of at least 30 semester credits of courses in literature and English language or in an acceptable combination of these and related subjects. (Graduate courses taken elsewhere may, at the discretion of the Department, be accepted in lieu of courses that would otherwise be required at the University of North Dakota.)

Financial Assistance

Financial aid available to graduate students includes Graduate Teaching Assistantships and Board of Higher Education tuition scholarships for North Dakota residents.

Degree Requirements

Master of Arts with thesis

1. English 500, English 501 and 501L for Graduate Teaching Assistants, and either English 510 or 511 with grades of A or B.

2. Up to four credits of Readings and Research courses (English 590, 591, and 593) may be used to supplement the standard graduate offerings.

3. Four credits are allowed for the thesis.

Doctor of Philosophy

1. Thirty (30) semester credits of course work after the M.A. should be selected so as to help the student prepare for the comprehensive examinations, provide work in desirable cognate areas, and give necessary background in the field of the dissertation.

2. Up to 10 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 course work 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, 501 and 501L (for Graduate Teaching Assistants only), and 510 or 511 with grades of B or better.

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 Literacy Criticism. 3 credits. A history of European criticism from the Classical Greek period to the present day, with emphasis on major texts.

511. Introduction to Graduate Studies. 3 credits. A course in applied criticism. Repeatable when topics vary.

515. Creative Writing. 3 credits. Prerequisite: English 411 or 412 or permission of the instructor. Creative writing of fiction and poetry. 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 fiction and poetry of professional quality. Repeatable once by M.A. candidates, three times by Ph.D. candidates.

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.

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. A. American Literature C. Cinema E. English Literature L. English Language W. Creative Writing Prerequisites: 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. A. American Literature C. Cinema E. English Literature L. English Language W. 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.

Courses

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.

402. Studies in Early Renaissance Literature. 3 credits.

403. Studies in Colonial American Literature. 3 credits.

404. Studies in Late 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.

409. Art of the Cinematic Drama. 3 credits.

411, 412. The Art of Writing. 6 credits.

415. Special Topics in Literature. 1 to 4 credits.

417. Special Topics in Language. 1 to 4 credits.

419. Teaching English as a Second Language. 3 credits.

442. History of the English Language. 3 credits.

Geography

Professors Hansen, Hemmasi (Chair), Munski, Rundquist, Seidel, Todhunter

Program Description

The Geography Department graduate program includes both thesis and non-thesis options leading to the M.A. and M.S. degrees. The principal areas of concentration are regional and urban development, environmental geography, geographic education, and geographic techniques: cartography, GIS, and remote sensing of the environment. 

The graduate program provides an opportunity for 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 Great Plains and Prairie Provinces.

The regional and urban development track within the graduate program emphasizes the background education useful for students to enter careers such as land use planning, federal government service, historic preservation, and travel and tourism as well as being a stepping stone to pursue a doctoral degree in human geography elsewhere. The students in the M.A. option take a well-chosen, career-orientated selection of courses in population, social, urban, political, cultural, historical, and regional geography. Students are encouraged to take cognate work in business and public administration, international relations, anthropology and archaeology, sociology, languages, and other fields appropriate to each student’s long-range plans.

The graduate program in environmental geography reflects a geographic focus on land use, environmental quality, human impact, and biogeography and landscape ecology. Students follow a sequence of required and elective courses which reflects an environmental emphasis such as resource management, water resources, climatology, or human-environmental relationships. The program is designed to prepare students for doctoral study or for a professional career in government, industry, or education in a wide variety of environmentally related fields. Students are encouraged to pursue a cognate/minor in biology, geology, and other related fields. In addition, the department offers an array of courses in geographic information technologies, allowing students to build expertise in GIS, remote sensing, cartography, and spatial analysis.

More complete information regarding faculty, laboratory facilities, recent publications and paper presentations, course work, and entry level graduate placement can be obtained from our web page (http://www.und.nodak.edu).

Admission Requirements

1. A GPA of at least 3.00 in all undergraduate work.

2. A minimum of 18 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 of two seminars in Geography depending upon the focus of the student’s approved program, either Geog 521 (Physical) for the M.S. or 551 (Human) for the M.A.
3. A minor or cognate area of study that reflects the student’s focus on physical or human topics.

**Thesis**

1. A minimum of 30 semester credits including 9 semester credits of 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 16 credits that focus upon geographic skills and techniques which includes quantitative methods, computer graphics and mapping, geographic information systems, remote sensing, field methods, library research and cartography. The non-thesis programs emphasize development of geographic skills that can be applied to specific problems and projects which may or may not involve research.

**Courses**

501. Geographic Thought and Philosophy. 2 credits. Required of all graduate students. A scholarly examination of the scope and content of geography from its inception to the present. 521. Seminar in Physical Geography. 3 credits.

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.

551. Seminar in Human Geography. 3 credits.

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. On Demand.

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 and in residence 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.

591. Directed Study in Geographical Problems. 1 to 4 credits.

595. Research Topic in Geography. 3 credits.


334. Climatology. 4 credits.

377. Quantitative Applications in Geography. 2 credits.

377L. Spatial Analysis Laboratory. 1 credit.

421. Selected Topics in Physical Geography. 3 credits.

422. Geography of Water Resources. 3 credits.

452. Selected Topics in Economic Geography. 3 credits.

453. Historical Geography. 3 credits.

455. Political Geography. 3 credits.

457. Urban Geography and Planning. 3 credits.

462. Geography of North America II. 3 credits.

463. Regional Geography. 2 to 3 credits.


471LL. Computer Mapping Laboratory. 1 credit.

474. Introduction to Geographic Information Systems. 3 credits.

475. Digital Image Processing. 3 credits.

**Geology**

Professors Beaver, Forson, Gerla (Graduate Director), Ghassemi, Gosnold, Groenenold, Hartman, Korom, LeFeber (Chair), Matheney, 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; and 4) geophysics. Studies include geology, geophysics, and geochronology of the earth. 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.

**Admission Requirements**

1. At least 30 semester credit hours in the geological sciences with a GPA of at least 3.00.
2. Ten (10) upper division semester hours of geological sciences and the equivalent of physical geology, historical geology, and a geology field camp. Applicants have the option to fulfill these requirements by: 1) taking the appropriate undergraduate courses for credit; 2) demonstrating competency by taking appropriate advanced courses; or 3) demonstrating competency by written examinations in general or specific subject areas. Students with degrees in other areas of science or engineering may, upon approval of their advisory committee, use upper division credits in place of the geology requirement, but must complete the equivalent of physical geology, historical geology and geology field camp (the equivalent of approximately 14 semester credits).
3. One year minimum of chemistry and physics.
4. One semester of analytic geometry and calculus (equivalent to Math 165 at UND) for the M.A. degree; the entire calculus sequence (equivalent to Math 165, 166, 265, at UND) for the M.S. and Ph.D. degrees.
5. Deficiencies in the required undergraduate preparation in mathematics or the related sciences may be corrected by taking the required courses, without graduate credit, after beginning graduate work in provisional or qualified status.

Applicants are expected to score at the 50th percentile or better on the Graduate Record Examination General test. 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 course work.
2. Completed 30 semester hours of course work and 8 hours of upper division course work 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. 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 page 180 of this 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 6 semester credits of course work, at the graduate or undergraduate level, in each of the following subject areas:

a) mineralogy, petrology, and geochemistry
b) sedimentology, stratigraphy, and palentology
c) hydrogeology and geomorphology
d) structural geology and geophysics

The time normally needed to complete the requirements for the master’s degree in geology is about two years of full-time work. Students with graduate teaching or research assistantships may need more time.

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 course work in geology (and of courses listed in the Graduate section of the catalog) may be taken for graduate credit.

Doctor of Philosophy

Please see page 186 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 isotope geochemistry, 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. Principles of paleontology; B. Evolution and the fossil record; C. Paleocology; 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 CTL 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. Prerequisite: Geol/GeoEn 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. Hydrogeochmistry. 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/GeoEn 417, Geol 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.

322. Engineering Geology. 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.

410. Sedimentology and Stratigraphy. 5 credits.

414. Geophysics. 3 credits.

415. Invertebrate 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.

History

Professors Berger, Clingan, Ellis, Etting, Handy-Marchello, Iseminger, Mochoruk, Porter

Program Description

The department of History offers programs leading to the Master of Arts degree and the Doctor of Arts degree. The M.Ed. degree is also available for students who wish to complete an education degree with an area of concentration in History. See pages 180 and 181 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 6 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 on page 188 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 3 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. General and advanced (history) tests of the Graduate Record Examination are optional, but strongly suggested 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 3-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 8 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.

Courses

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 American historians.
511. Research Seminar in American History. 3 credits. Required for all candidates for the 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.
515. Research Seminar in European History. 3 credits. Required for all candidates for the 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.
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.)
593. Readings in American History—Colonial/Revolutionary. 2 to 3 credits. Requires examination of the historical literature pertaining to the Colonial and Revolutionary periods of United States History.
593. Readings in American History—Nineteenth Century. 2 to 3 credits. Requires examination of the historical literature pertaining to nineteenth-century United States History.
593. Readings in American History—Recent. 2 to 3 credits. Requires examination of the historical literature pertaining to twentieth-century United States History.
593. Readings in American History—Latin America. 2 to 3 credits. Requires examination of the historical literature pertaining to Latin American History.
594. Readings in European History—Ancient. 2 to 3 credits. Requires examination of the historical literature pertaining to the Ancient World, including Greece, Rome, and the surrounding area.
594. Readings in European History—Medieval and Early Modern. 2 to 3 credits. Requires examination of the historical literature pertaining to Medieval and Early Modern Europe.
594. Readings in European History—Absolutism and Revolution. 2 to 3 credits. Requires examination of the historical literature pertaining to the Age of Absolutism and the era of the French Revolution.
594. Readings in European History—Modern. 2 to 3 credits. Requires examination of the historical literature pertaining to Modern Europe, the period since 1815 to the present.
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.

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.
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.
Industrial Technology

Professor Diez (Graduate Director), Holten, Yearwood

Program Description

The faculty of Industrial Technology offer two program options 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 and 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 course work 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:

A minimum of 30 semester credits including 9 semester credits for approved minor or cognate courses.

Credits

1. EFR 515 or EFR 516 Statistics I, II 3
2. IT 525 Research in Industrial Technology 3
3. IT 550 Industrial Technology Management 3
4. IT 598 Thesis 3

B. Non-Thesis Option:

A minimum of 32 semester credits including 9 semester credits for approved minor or cognate courses.

1. EFR 515 Statistics I 3
2. IT 525 Research in Industrial Technology 3
3. IT 550 Industrial Technology Management 3
4. IT 997 Independent Study 2

C. Optional courses for Thesis or non-Thesis Programs

535 Trends & Issues in Industrial Tech 3
537 Graduate Cooperative Education 3
540 Supervision and Industrial Training 1-3
545 Seminar in Industrial Technology 1-3
550 Quality Planning and Analysis 3
565 Product Safety and Liability 3
580 Special Topics 1-4
593 Technical Problems in Industrial Technology 1-3
996 Continuing Enrollment 1-12

D. General:

1. At least 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

525. Research in Industrial Technology, 2 credits. Principles of methods and evaluation of research in industrial technology. Individual exploration of possible research topics for thesis.

535. Trends and Issues in Industrial Technology, 3 credits. A comprehensive investigation and analysis of the trends, issues, and influences that challenge the profession of industrial technology in a changing technology-dominated society.

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 to 3 credits. Investigation and presentation of topical courses related to industry, technology, education, and industrial training. Repeatable to three credits.

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.

565. 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.


596. 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 6 credits.

593. 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 course. Course may be repeated for a total of three credits.

Instructional Design and Technology

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 (CEHD) and follows the IDT, CEHD, UND, UND Graduate School, and NDUS rules and policies.

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 technology. These graduates will be able to design, develop, implement, and evaluate technology-based instruction that is effective and that reflects sound principles of teaching and learning.

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. The grade point average requirement for graduate work is a 3.5 or better. Provisional admission to the IDT program 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 group.

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 (wordprocessing, database, spreadsheet, drawing/painting, graphing, and other common applications).

Degree Requirements

The IDT master’s degree programs offer three options: the M.Ed., the M.S. (independent study option), and the M.S. (thesis option). The programs are all targeted at 35 credits. These 35 credit hours consist of 11 hours of core course work in instructional design and technology, 3 to 6 hours of foundations course work in education and psychology, 3 hours of course work in the area of curriculum, 3 hours of course work in the research option, 6 to 9 hours of course work in some area of specialization, 2 hours of internship, 2 hours of directed studies (practicum), and 2 hours of independent study credit. The M.S. (thesis option) adds 4 credits for the thesis and deletes the 2 credit practicum.

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.
- Curriculum component: Planning for and evaluating instruction.
- Foundations component: Fundamental background in psychology and philosophy of education.
- Clinical component: Opportunities for application.
- Cognate component: Opportunity for area or skill specialization.

The IDT course requirements are organized within a major, foundations area, and cognate. The major consists of the IDT core, the Curriculum requirement, and the Research requirement. Students in both the M.Ed. and M.S. options will be required to complete 11 hours of course work in IDT subject matter. This requirement includes:

Credits

- IDT 510: Technology-Based Instruction: Applications and Methods 3 credits.
- IDT 520: Instructional Systems Design & Development 3 credits.
- IDT 530: Introduction to Computer-Based Instruction and 3 credits.
- IDT 590: Special Topics in IDT: or 2 credits.
- IDT 591: Readings in IDT: or 2 credits.
- IDT 592: Research in IDT: 2 credits.

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 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. Students pursuing this degree will learn the theoretical issues associated with technologically supported instruction but their emphasis will be in the application of this knowledge in terms of best practice. An independent study project (research) is required and is considered a capstone experience. The independent study may address a practical problem or address a theoretical construct in the same way that a thesis does.

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. 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 in their work context. The M.S. (independent study option) is intended for those students who prefer to emphasize the development and evaluation of application and practice. Required course work within the two options is consistent with this distinction between an emphasis on research or practice.

Cognate/Minor

The IDT program welcomes graduate students who want to learn more about the integration of technology with instruction. To complete a cognate or minor in IDT, students must take IDT 510, IDT 520, and IDT 530 for a total of 9 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

510. Technology-Based Instruction: Applications and Methods. 3 credits. A study of the various methods for using technology to deliver and/or support instruction: tutorials, drills, simulation, interactive video, instructional games, intelligent computer-based instruction, performance support systems, job aids, testing, distance learning, intelligent tutoring systems, and instructional management systems.

520. Instructional Systems Design and Development. 3 credits. A study of methodologies for designing, developing, and evaluating technology-based instruction. Topics include needs analysis, problem analysis, assessment of instructional outcomes, design of instructional units, development/production models, formative evaluation, and summative evaluation.

530. Introduction to Computer-Based Instruction. 3 credits. An examination of the technology (hardware and software) for developing and delivering computer-based instruction (CBI). A study of the characteristics of high-quality CBI, addressing such topics as program structure, user interface, navigation, message/screen design, use of graphics, response analysis, feedback strategies, error checking, branching, and computer-managed instruction.

584. 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.

590. Special Topics in Instructional Design and Technology. 1 to 3 credits. An in-depth study of selected topics in instructional design and technology. Topics will vary with faculty expertise and current issues. Some topics would include simulations, instructional applications of the world wide web, performance support systems, adaptive testing, intelligent tutoring systems, and hypermedia applications.

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. Supervised 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 instruction. All projects will require a final report.

597. 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.

598. Thesis. 4 to 9 credits. The thesis is an original research project completed under the supervision of a thesis committee.
Kinesiology

Professors Brinkert (Chair), M. Short, S. Short (Graduate Director), Steen, Von Duvillard, Whitehead

Program Description

The Department of Physical Education and Exercise Science offers programs of study leading to the Master of Science (thesis or non-thesis option) with a major in kinesiology. The program provides students with opportunities to study the scientific foundations of kinesiology as well as several of its professional applications.

Current areas of concentration include:
- Exercise Physiology
- Fitness/Wellness
- Sports/Exercise Psychology

Students, with the help of their advisors, develop programs of study to meet the degree requirements (see below), concentration requirements, and their own interests.

Admission Requirements

1. A minimum of 20 semester credits of undergraduate work in kinesiology, physical education, and related areas.
2. A personal statement of academic goals, which will be used to evaluate the adequacy and appropriateness of undergraduate preparation.
3. An applicant without satisfactory undergraduate preparation may be admitted to the program, but will be required to remove deficiencies by completing the necessary undergraduate courses without receiving graduate credit for them.
4. Satisfactory scores on the Graduate Record Examination (General Test).

Degree Requirements

1. A major of at least 30 (thesis) or 32 (non-thesis) credits or a major with a minor or a cognate.
3. Two courses in methods of data analysis, one of which must be in statistical analysis.
4. 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 9 graduate credits.

Non-Thesis Option

1. Select permanent advisor and submit the Program of Study by the completion of 9 graduate credits.
2. Pass a written and oral final comprehensive examination administered by the department’s graduate faculty.

Courses

501. Introduction to Research in Kinesiology, 4 credits. The study of quantitative and qualitative research methods used in the field of kinesiology.
502. Evaluation in Physical Education, 3 credits. Prerequisite: PEXS 415 or consent of the instructor. The course will deal with the determination of standards for human performance in physical education and sport, and the principles to apply these standards for exercise prescription.
511. Theory and Practice in Physical Education Administration, 2 credits. Prerequisite: PEXS 340 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 a physical education program.
512. Theory and Practice in Sports Administration, 2 credits. Problems, policies and facilities in athletic departments with emphasis on the secondary level. Public relations problems met and problems of interrelationships with the general curriculum.
513. Supervision of Physical Education, 3 credits. Prerequisites: PEXS 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. Prerequisite: PEXS 405, experience as a director or by consent of the instructor. Study of the basic ingredients required to administer a successful intramural program.
521. Analysis of Physical Education Teaching and Coaching, 3 credits. A review of the knowledge and skills for instruction in sport and fitness activities, with practical applications to teaching and coaching.
522. Historical and Philosophical Foundations of Physical Education, 2 credits. Educational justification of various phases of the physical education program based on historical and philosophical evidence.
524. Adapted Physical Education, 3 credits. Prerequisite: PEXS 404 or consent of the instructor. Theory and practice of modified physical education activities adapted to needs, capacities and abilities of the atypical child.
525. Motor Development, 3 credits. Prerequisites: PEXS 276 or PEXS 335, 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.
529. Exercise Psychology, 3 credits. Prerequisites: PEXS 440 or consent of the instructor. A research-based study of the psychological aspects that are associated with participation in exercise/physical activity.
530. Sports Biomechanics, 4 credits. Prerequisite: PEXS 332 or consent of the instructor. The application of principles of mechanics to the study of human motion in sports and exercise.
531. Sport Psychology, 3 credits. Prerequisite: PEXS 440 or consent of the instructor. A research-based study of the psychological aspects associated with participation in sport.
533. Motor Learning and Control, 3 credits. Prerequisite: PEXS 276 or equivalent or consent of the instructor. Study of the acquisition and control of human motor skill.
534. Sport Sociology, 3 credits. Prerequisite: PEXS 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, 4 credits. Prerequisites: PEXS 402 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. This is a lecture/laboratory course.
536. Advanced Exercise Physiology II, 4 credits. Prerequisites: PEXS 535 and consent of the instructor. Acute and chronic muscle function, energy metabolism, and regulatory processes of skeletal muscle and muscle cell function during rest, during exercise and during recovery will be the focus of this lecture/laboratory course.
538. Exercise in Health and Disease, 4 credits. Prerequisites: PEXS 535 and 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. Health states include aging and pregnancy. This is a lecture/laboratory course.
539. Theory and Practice of Exercise Testing, 4 credits. Prerequisites: PEXS 535 and consent of instructor. The focus of this lecture/laboratory course is on the electrophysiology of myocardial function and exercise prescription for asymptomatic and symptomatic 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 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 Physical Education and Exercise Science, 1 to 4 credits. Prerequisite: Consent of instructor. Investigation of special topics in the study of physical education and exercise science not included in current departmental course offerings.
556. 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 selected topics in kinesiology.
585. Internship, 3 to 6 credits. Prerequisite: Appropriate foundational and major area coursework; consent of advisor and on-site supervisor. Professional experience and skill development through supervised placement at an approved work site (or other program) relevant to the course of study.
590. Individual Research in Kinesiology, 1 to 4 credits. Prerequisite: PEXS 501 and consent of the student’s faculty advisor. Library, laboratory or field research of an approved project in Sport Pedagogy or Sport and Exercise Science.
592. Directed Readings in Kinesiology, 2 to 3 credits. Prerequisite: PEXS 501 and consent of the student’s faculty advisor. 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: Bickford (Graduate Director), C. Black, H. Black, Clifton, Dooley, Everett, Karan (Chair), Levinsohn, Lowe, Marlett, Meyer, Rhodes, Roberts, Tuggy, Weber

Program Description

The Master of Arts degree in Linguistics emphasizes training for independent linguistic field work, with heavy emphasis on phonetics, field methods, and problem-solving techniques. It is a cooperative program between UND and SIL International, and offered during a nine-week summer session every year. Candidates for the degree will therefore be expected to spend at least two summers enrolled in the program on campus. (See the detailed information at www.und.nodak.edu/dep/linguistics/lingma.htm.)

Admission Requirements

1. A minimum of 20 semester credits in linguistics and foreign language, of which at least 10 must be linguistics.

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 4 credits for a thesis and may include a minor or cognate (see page 188).

The student may choose to complete part of the credit requirements through courses with linguistics content offered in other departments (e.g., English and Languages). 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. Those who do may be eligible for support as a Graduate Teaching Assistant in English during the academic year.

Students may take the linguistics courses even without applying to the M.A. program. They should apply directly to SIL, preferably by April 15 (April 1 for non-U.S. citizens). Application and other information is available at: www.und.edu/dep/linguistics/silund.htm, or call 1-800-292-1621. The co-chairs of the Linguistics program are Mark Karan (mark_karan@sil.org) and Stephen Marlett, PO Box 8987, Catalina, AZ 85738 (steve_marlett@sil.org). Further information is available from the SIL office on campus when the courses are in session during the summer (777-8105).

Courses

503. Phonology II. 3 credits. Prerequisite: Linguistics 450, 451, or equivalent. Phonological phenomena examined from a generative point of view; emphasis on 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 commonly 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. 4 credits. Prerequisite: Linguistics 450, 452, or equivalent. Corequisite: Linguistics 451 or equivalent. Intensive work with speakers of non-Indo-European languages for the purposes of developing skill in eliciting useful data and analyzing the semantic, grammatical, and phonological structures of human 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, selectional restrictions, operators and their scope, illocutionary force, inference, and relations between form and meaning.

520. Principles of Literacy. 3 credits. Corequisites: LING 521, 522. Upon completion of this course, students will be able to: (a) explain in detail the profile of illiteracy in the world today; (b) explain in detail the inter-relationships between illiteracy, poverty, politics, and environment; (c) develop an appropriate writing system for an unwritten language; (d) explain the factors that go into orthography design; (e) describe strategies for testing and evaluating orthography proposals; (f) explain and teach the principles of adult education; (g) identify the major literature on adult literacy.

521. Literacy Program Planning and Management. 3 credits. Corequisites: LING 520, 522. Upon completion of this course, students will be able to: (a) explain, with examples, change processes in traditional communities; (b) identify and describe the major movements and trends in literacy; (c) identify the major “players” in the field of adult literacy; (d) design a complete literacy program; (e) explain alternative strategies for designing and managing a literacy program; (f) evaluate the need for external funding in a literacy program; (g) do detailed costing for a literacy program; (h) write a funding proposal for a literacy program; (i) use the LinguLinks Electronic Performance Support system.

522. Materials and Methods in Adult Literacy. 3 credits. Corequisites: LING 520, 521. Upon completion of this course, students will be able to: (a) explain the major theories of reading and the history of their evolution; (b) explain, describe, and critique three different instructional strategies for teaching reading; (c) design instructional materials from any one of three different strategies for teaching reading; (d) design teacher training protocols for adult literacy programs; (e) design testing protocols for reading materials; (f) develop instructional materials for transitional literacy programs; (g) organize and direct a writers’ workshop; (h) explain the need for post-literacy materials and how to develop these; and (i) explain the major issues involved in developing a multilingual education program for school children.

590. Directed Studies in Linguistics. 1 to 4 credits. Supervised individual study. May be repeated if the topic is different. A maximum of 8 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.

456. Articulatory Phonetics. 2 credits.

451. Phonology I. 3 credits.

Mathematics

Professors Bevelacqua, Collings, Dearden (Chair and Graduate Director), Dunnigan, Gildsorf, Gregory, J. Iiams, Khavanin, Metzger, Millsapgh, Peterson, Prigge, Richards, Wells

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 mathematics. Students who have not completed the equivalent of Math 431 and Math 432, Advanced Calculus, as undergraduates will be required to do so as part of their graduate program. Students without the required degree, or equivalent, may be admitted but will be required to satisfactorily complete undergraduate courses to make up their deficiency before advancement to Approved status.

Degree Requirements

Master of Science

1. A major of 30 (thesis) or 32 (non-thesis) credits or 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 16 credit hours of graduate work in mathematics, with at least 8 credits being at the 500 level or above, including 2 hours of 997, Independent Study.
Mechanical Engineering

Professors Ames, Bandyopadhyay, Bibel, Grewal, Moen (Chair), Semke

Program Description

The Department of Mechanical Engineering offers graduate programs leading to the Master of Science and Master of Engineering degrees. The M.S. degree is offered under both the thesis and non-thesis options.

The department offers a Bachelor of Science in Mechanical Engineering BSME/Master of Science (with a major in Mechanical engineering) and BSME/Master of Engineering (MEngr) degree. Qualified students will be able to complete requirements for both degrees in one year beyond the baccalaureate degree. Interested students should apply for the program the semester before the BSME degree would be awarded. All requirements for both degrees must be met, but up to six credits of prior-approved course work may be counted toward each of the two degrees. Credits counted toward both degrees may not include courses required for the BSME degree but may include courses selected to meet technical or Mechanical engineering electives required for the BSME degree.

Admission Requirements

1. B.S. degree in Mechanical Engineering from an ABET accredited program. (Students who hold another engineering or science degree may be admitted to Provisional or Qualified Status with an obligation to acquire an appropriate background in Mechanical Engineering.)
2. Graduate Record Examination Test required for those with undergraduate degrees from other than ABET-accredited programs.
3. Master of Science — An overall undergraduate GPA of at least 2.75 (3.0 at the time of admission for BSME/MS combined degree students) or a GPA of at least 3.00 for the last two years.
4. Master of Engineering — An overall undergraduate GPA of at least 2.50 (2.75 at the time of admission for BSME/MSEng combined degree students) or a GPA of at least 2.75 for the last two years.

Degree Requirements

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 environmental 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 course work will be required to enroll in these courses. A course will not be repeated in less than 2 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: ME 311. 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 achievement for cost effective machining of these materials.
523. Advanced Machine Design. 3 credits. Prerequisite: Mechanical Engineering 322 and 421. Advanced design and analysis of machine components; kinematic synthesis and analysis of mechanisms, force analysis, rotordynamics, gyrody-namics, stresses in thick cylinders and flywheels, lubrication, statistical considerations, energy methods, curved beams.
526. Advanced Vibrations. 3 credits. Prerequisites: Mechanical Engineering 426. Advanced vibration theory including the solutions of multi-degree of freedom coupled systems, continuous systems, energy methods, non-linear vibrations.
529. Advanced Finite Element Methods. 3 credits. Prerequisites: ME 429 or consent of instructor. Computer-aided techniques for finite element analysis of engineering systems. Topics include solution algorithms for nonlinear methods, large deflection, inelastic and contact analysis, and analysis of vibrating systems.
Microbiology and Immunology

Professors Bradley, Flower, Hill, Melvold (Chair), Nilles, Young (Graduate Director)

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, and 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

See Graduate School Requirements for the M.S. on page 180.

Doctor of Philosophy

See Graduate School Requirements for the Ph.D. on page 186. 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 bypass the M.S. degree and continue directly into the Ph.D. program. Requirements for these options include:

—Admission into the graduate program with approved status.
—An overall GPA of no less than 3.50 for all graduate work.
—Successful completion of the Departmental Qualifying Diagnostic Examination is required to bypass the M.S. degree. This examination will consist of a written and oral presentation of the student’s proposed dissertation research.

Joint Ph.D.-M.D. Degree

See Program Requirements for Ph.D./M.D. Degree on page 188.

Courses

Courses marked with an asterisk (*) are offered in alternate years only.

BIMD 500. Cellular and Molecular Foundations of Biomedical Science. 7 credits. Prerequisite: A) one year of organic chemistry or B) one semester of organic chemistry and one course in either biochemistry or cell biology or Cp permission of course director. The focus of this interdepartmental team-taught course will be in areas that are fundamental to all biomedical science graduate programs. Emphasis will be on developing a strong grounding in biochemistry, cell biology and molecular biology with themes covering proteins, metabolism, information flow, vectors, membranes, cell signaling, cell shape and movement, cell growth and division, and immunology.
**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 512. Seminars in Biomedical Sciences.** 1 credit. Corequisite: BIMD 500 or permission of course director. Students will attend a weekly school-wide seminar series. Students will further explore aspects of scientific literature and fundamentals of scientific writing, and have opportunities to interact with intramural seminar speakers.

**BIMD 513. Seminars in Biomedical Sciences.** 1 credit. Prerequisites: BIMD 512 or permission of course director. 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 presentation.

**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.

**502. Clinical Virology.** 2 credits. Prerequisite: Previous course in microbiology and/or consent of instructor. Emphasizes current concepts about human viruses regarding pathogenesis, clinical syndromes, epidemiology, prophylaxis and treatment.

**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.

**505. Environmental Microbiology.** 2 credits. Prerequisites: Microbiology 302 or permission of the instructor. Students will meet 4 hours per week for half of the semester to discuss important issues related to environmental microbiology. Discussions will be based upon readings from the current literature.

**506. Biology of Microorganisms.** 2 credits. Prerequisite: Biochemistry 301 or equivalent. Structural characteristics of bacteria, fungi, viruses, and protozoa. The physiology, metabolism, and genetics of bacteria: modes of action and spectrum of activity of antimicrobial agents.

**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.** 2 credits. Prerequisite: BIMD 500 or equivalent. An introduction to the fundamentals of immunology including immunocommunity, humoral and cellular response, hypersensitivities, immunodeficiency, immunogenetics, tolerance and immunodiagnosis.

**510. 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.

**511. 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 immunoassay, and western blot techniques are presented. S/U grading only.

**514. Radiotrace Techniques.** 2 credits. Prerequisite: Microbiology 302 or equivalent. Laboratory procedures utilized in working with radioisotopes. Care and handling of radioactive by-products, radiation survey and survey records, monitoring techniques and instruments, and licensing procedures are covered.

**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.

**516. Virology Laboratory.** 3 credits. Prerequisite: Microbiology 508 or consent of instructor. Basic techniques in virology and tissue culture.

**517. Advanced Immunology Laboratory.** 2 credits. Prerequisite: Microbiology 509 or equivalent. Laboratory experience will include procedures for analysis of antigens, antibodies, and cell mediated immune responses.

**518. Molecular Genetics Laboratory.** 2 credits. Prerequisites: Basic courses in microbiology and genetics or consent of instructor. Fundamental techniques in gene manipulation, cloning, and engineering.

**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.

**NOTE:** MBio 502 and 506 are undergoing revision. Require consent of instructor.

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**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, Voice and Piano Performance/Pedagogy, Composition, Choral Conducting, and Instrumental Conducting. 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.
3. Recommendations from former employers or supervisors indicating success or potential success as a music teacher (for Music Education students only).
4. A repertoire list showing the extent of the repertoire for the major performing instrument or voice (Performance students only).
5. A representative sample of compositions (Composition students only).
6. An audition on the major performing instrument, voice, and/or conducting. (Students who are unable to perform an audition in person may submit a tape. This recording should be of a recent live performance.)
7. Application review by the appropriate music faculty. (Students who are unable to visit the UND campus and meet with the music faculty may be telephoned for an interview. This conference call will assess the student’s goals regarding graduate study in music at UND.) (Vocal Performance students must meet the following German and/or French language requirements: 2 years of German or French, or 1 year of each, or the equivalent in reading and diction skills. Language requirements may be met with the required amount of course work [one or two years] or by demonstrating Level II [for one year] or Level IV [for two years] proficiency in the Languages Department Placement Examinations. Students must also demonstrate adequate French, German and Italian language diction skills to the Department of Music.)

Language deficiencies may be removed during the master’s degree program of study, but such credits will not count toward the master’s degree.

All students admitted to graduate study in music, whether to Approved, Qualified, or Provisional status, will be examined upon their arrival on campus so that the faculty of the department of music may more fully assess the background, accomplishments, and ability of each student and in order to provide appropriate advisement for the beginning of graduate study. This process will involve some or all of the following activities:

1. A Music History Test
2. A Music Theory Test
3. An Ear Training and Sight-singing Test
4. A Diction Test in German, French, and Italian (for Vocal Performance students only)
Achievement of a minimal score on the advisory examinations or completion of Music Theory Review (MUSD 501) and Music History Review (MUSD 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 of which at least one-half must be at or above the 500 level. Courses on the program must be listed in this catalog. The program has a major only (i.e., no cognate or minor areas). All students complete a Music Core Course Curriculum of 9 credits which includes Music 500, 502, and 508. The degree is available in five specializations: (1) Music Education, (2) Performance or Pedagogy (Voice, Piano or Organ), (3) Composition, (4) Choral Conducting, and (5) Instrumental Conducting.

**Music Education Specialization**

MUSD 503 Curricular and Psychological Foundations of Music Learning 3 credits
MUSD 507 Foundations of Music Education 3 credits
MUSD 598 Research in Music Education 3 credits
MUSD 599T Independent Study (Music Education topic) 2 credits
Electives in Music Education 2 credits

**CORE COURSES** (9 credits)
MUSD 500 Introduction to Graduate Study 3 credits
MUSD 502 Perspectives in Music Theory 3 credits
MUSD 508 Perspectives in Music History 3 credits

**OTHER STUDIES** (7 credits)
MUSD 521 or 524 Instrumental or Choral Literature 3 credits
MUSD 561 or 562 Advanced Choral or Instrumental Conducting 2 credits
MUSD 594 and/or MUSD 595 Individual Lessons 2 credits

**ELECTIVES** (3 credits)

**Performance or Pedagogy Specialization (Vocal/Keyboard)**

**CORE COURSES** (9 credits)
MUSD 500 Introduction to Graduate Study 3 credits
MUSD 502 Perspectives in Music Theory 3 credits
MUSD 508 Perspectives in Music History 3 credits

**OTHER STUDIES** (11 credits)
MUSD 523 or 525 Keyboard or Vocal Literature 3 credits
MUSD 551 or 552 Vocal or Keyboard Pedagogy I 3 credits

**ELECTIVES** (5 credits)

Perfomance Track
MUSD 596 Individual Lessons 8 credits
MUSD 599 Graduate Recital 2 credits
MUSD 599T Independent Study 2 credits

Pedagogy Track
MUSD 596T Individual Lessons 4 credits
MUSD 553 or 554 Vocal or Keyboard Pedagogy II 3 credits
MUSD 590 or 591 Vocal or Keyboard Internship 1 credit
MUSD 597T Special Projects (Pedagogy topic) 2 credits
MUSD 599T Independent Study 2 credits

**Music Composition Specialization**

MUSD 506 Advanced Composition 8 credits
MUSD 593 Final Project in Composition 4 credits

**CORE COURSES** (9 credits)
MUSD 500 Introduction to Graduate Study 3 credits
MUSD 502 Perspectives in Music Theory 3 credits
MUSD 508 Perspectives in Music History 3 credits

**OTHER STUDIES** (4 credits)
MUSD 561 or 562 Advanced Choral or Instrumental Conducting 2 credits
MUSD 594 or 595 Individual Lessons: Piano 2 credits

**ELECTIVES** (7 credits)

**Choral Conducting Specialization**

MUSD 561 Advanced Choral Conducting 2 credits
MUSD 562 Advanced Instrumental Conducting 2 credits
MUSD 595 Individual Lessons (Conducting) 2 credits
MUSD 599 Graduate Recital (Conducting) 2 credits
MUSD 524 Choral Literature 3 credits
MUSD 599T Independent Study 2 credits

**CORE COURSES**
MUSD 500 Introduction to Graduate Study 3 credits
MUSD 502 Perspectives of Music Theory 3 credits
MUSD 508 Perspectives of Music History 3 credits

**OTHER STUDIES**
MUSD 594 Individual Lessons (Voice) 2 credits
MUSD 580/570 Graduate Ensemble Performance 2 credits
MUSD 551 Vocal Pedagogy I 3 credits
ELECTIVES 3 credits

**Instrumental Conducting Specialization**

MUSD 562 Advanced Instrumental Conducting 2 credits
MUSD 561 Advanced Choral Conducting 2 credits
MUSD 595 Individual Lessons (Conducting) 2 credits
MUSD 599 Graduate Recital (Conducting) 2 credits
MUSD 524 Instrumental Literature 3 credits
MUSD 599T Independent Study 2 credits

**CORE COURSES**
MUSD 500 Introduction to Graduate Study 3 credits
MUSD 502 Perspectives of Music Theory 3 credits
MUSD 508 Perspectives of Music History 3 credits

**OTHER STUDIES**
MUSD 594 Individual Lessons (Instrumental) 2 credits
MUSD 580/570 Graduate Ensemble Performance 2 credits
ELECTIVES 6 credits

For those in the composition concentration, there will be a final project in composition instead of an independent study.

**Residence and Transfer Requirements.** The specializations in Conducting require at least a one year residency. Other specializations have no residency requirement. At least one-half of the credits for the degree must be taken on the UND campus, however. A maximum of 8 credits may be transferred from another institution, and a maximum of 4 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 require the student independently to investigate a topic related to the major field. 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 subject.

The topic for an independent study must be approved by the student’s Advisory Committee. Approval is effected by the student completing a form titled Proposal of Independent Study, available with instructions from the Graduate School, then submitting the proposal to the Advisory Committee 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 the student is advanced to candidacy for the degree.

A preliminary draft of the independent study must be presented to the advisory committee sufficiently in advance of the deadline for filing the Final Report so that the committee may thoroughly evaluate the report. Five copies of the report (one each for the student, the Advisory Committee, and the department) must be accepted by the Advisory Committee before the advisor will certify its completion to the Graduate School (prior to the deadline specified in the Academic Calendar) and before the student’s advisor submits a grade to the Registrar’s Office. Music education students should refer to the department of music publication, “Guidelines for Music Education Independent Study.”

**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 will lead to a degree.
The student has not been admitted as a candidate for a degree. To become a candidate 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. Demonstration of graduate level performing proficiency on the major instrument, in voice, and/or as a conductor.
4. The appointment of a Faculty Advisory Committee consisting of the student’s advisor as chairperson, the chairperson of the Music Department or designee, and another member of the music faculty. In addition, a faculty member with pertinent specialties from outside the Music Department may be added to the committee. The Committee is appointed by the dean upon the recommendation of the chairperson of the Music Department. The chairperson of the Committee usually will 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 serve as the independent study advisor. The Committee is responsible for program advisement, independent study advisement, and examination of the student.
5. Approval of a Program of Study. Until such time as a student selects an advisor, the department chairperson 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. 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. Normally the program should be developed early in the second semester of enrollment but should be filed PRIOR to the semester or session in which the student intends to graduate.
6. Approval of a Proposal for Independent Study on a form available from the Graduate School. 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 an independent study. The proposal form and three copies should be filed no later than the beginning of the semester or session in which the student expects to graduate.

Students and their advisors will be notified in writing of the advancement to candidacy prior to the semester in which they plan to graduate.

**Final Examinations.** Candidates may not take the final comprehensive examination(s) unless they have applied to receive the degree, have been advanced to candidacy for the degree, are in satisfactory academic standing, and have been certified as eligible by the Graduate School in writing. All comprehensive examinations which are failed may be repeated only with the prior approval of the Advisory Committee, the chairperson of the department, and the dean, but in no event earlier than at the next regularly scheduled offering.

Candidates for the Master of Music degree must pass a written final comprehensive examination which will cover (a) the principal field, (b) music history and literature, and (c) music theory. Such examinations will be given and evaluated by the student’s Faculty Advisory Committee, 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) required for the degree will be arranged by the advisor and administered by the department no earlier than the semester preceding the semester in which the student intends to graduate.

**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. Prerequisite: Music 501 or passing grade on placement examination. A comparison and evaluation of formal systems in music with emphasis on developing performance concepts through the study of specific representative compositions.

503. Curricular and Psychological Foundations of Music Learning, 3 credits. An in-depth study of curriculum construction and implementation and the psychological processes of learning.

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 individual preparation. Credit does not count toward fulfillment of 32-hour minimum. Music graduate degree 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 in Music History, 3 credits. Prerequisite: Music 505, or passing grade on placement examination. A seminar developing the application of music history and music historical research approaches for music professionals. Topics may include: historically-informed musical analysis, historical evolution of musical forms, music criticism, music editing, musical sources, historical performance practice, and musical research for teaching.

512. Instrumental Literature, 3 credits. The study of instrumental music literature through scores and recordings.

523. Keyboard Literature, 3 credits. The study of keyboard literature through scores and recordings.

524. Choral Literature, 3 credits. The study of choral literature through scores and recordings.

525. Vocal Literature, 3 credits. The study of solo vocal literature through scores and recordings.

551. Vocal Pedagogy I, 3 credits. Teaching procedures, methods, and literature for teaching voice students from beginning through early intermediate levels, addressing questions of style, performance practices, editions, and techniques. Includes observation and teaching in both group and individual settings.

552. Vocal Pedagogy II, 3 credits. Prerequisite: Music 551, Vocal Pedagogy I. Teaching procedures, methods, and literature for teaching voice students from the late intermediate through advanced levels, addressing questions of style, performance practices, editions, and techniques. Includes observation and teaching in both group and individual settings. Regular grading.

553. Keyboard Pedagogy I, 3 credits. Teaching procedures, methods, and literature for teaching keyboard students from beginning through early intermediate levels, addressing questions of style, performance practices, editions, and techniques. Includes observation and teaching in both group and individual settings. Regular grading.

554. Keyboard Pedagogy II, 3 credits. Prerequisite: Music 552, Keyboard Pedagogy I. Teaching procedures, methods, and literature for teaching keyboard students from the late intermediate through advanced levels, addressing questions of style, performance practices, editions, and techniques. Includes observation and teaching in both group and individual settings. Regular grading.

561. Advanced Choral Conducting, 2 credits. Choral schools and composers since the sixteenth century, study of interpretations based on scores, recordings, and class performance.

562. Advanced Instrumental Conducting, 2 credits. Advanced techniques of instrumental conducting and score reading.

563. Administration and Supervision of Public School Music, 1 to 3 credits. Problems, techniques, and materials in supervision and administration of vocal and instrumental music programs in the public schools.

570. Instrumental Ensemble Performance, 1 credit.

580. Choral Ensemble Performance, 1 credit.

596. Vocal Internship, 1 credit. Prerequisite: Vocal Pedagogy I. Teaching of group and individual voice under the supervision and critique of voice faculty. Repeatable up to two (2) credits. Regular grading.

591. Keyboard Internship, 1 credit. Prerequisite: Keyboard Pedagogy I. Teaching of group and individual keyboard under the supervision and critique of keyboard faculty. Repeatable up to two (2) credits. Regular grading.

593. Final Project in Composition, 4 credits. The composition and performance of an original musical work of proportions suitable for a final composition project at the masters level.

594. Individual Lessons, 1 credit. Individual lessons in secondary instruments, conducting or voice. In registering for private lessons in voice, piano, organ, conducting or any orchestral instrument, “Voice” or the name of the instrument serves as the title of the course. For the final examination (excluding conducting), the student will perform before a faculty committee. May be repeated for credit without limitation.

595. Individual Lessons, 1 to 2 credits. Individual lessons in the major instrument, conducting or voice for the music education major. In registering for private lessons in voice, piano, organ, conducting or any orchestral instrument, “Voice” or the name of the instrument serves as the title of the course. For the final examination (excluding conducting), the student will perform before a faculty committee. May be repeated for credit without limitation.

596. Individual Lessons, 1 to 4 credits. Individual lessons in voice, piano or organ for the performance major. In registering for private lessons, “Voice” or the
name of the instrument serves as the title of the course. For the final examination, the student will perform before a faculty committee. May be repeated for credit without limitation.

597. Special Projects. 1 to 3 credits. Individual study in an approved area of interest to the student.

598. Research in Music Education. 3 credits. An introduction to qualitative and quantitative research methodology relative to music education.

599. Graduate Recital. 2 credits. The presentation of a graduate recital.

418. Electronic Music Techniques. 2 credits.

430. Advanced Methods for the Teaching of Woodwind, Brass, and Percussion Instruments. 1 credit. For summer camps and workshops only.

437. Music Education for Elementary Teachers. 1 to 4 credits

438. Music in the Junior High School. 1 to 4 credits.

443. Advanced Conducting and Interpretation of Band Literature. 1 credit. For summer camps and workshops only.

490. Individual Research in Band Literature and Method Books. 1 credit. For summer camps and workshops only.

## Nursing

**Professors Burd, Clayburgh, Gilje, Gragert, Guido, Hansen, Heuer, Ide, Labun, Lindseth, Melland, Milburn, Nichols, Yurkovich**

### Program Description

The College of Nursing offers a graduate program leading to a Master of Science (M.S.) degree with a major in nursing. Four areas of specialization are offered:

1. Anesthesia Nursing
2. Clinical Nurse Specialist in Nursing Therapeutics
3. Family Nurse Practitioner
4. Health Administration in Nursing

The program is designed 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 National League for Nursing Accrediting Council (NLNAC), and has preliminary approval of the Commission on Collegiate Nursing Education (CCNE). The course of study for Anesthesia Nursing 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 minimum GPA of 3.00 for the last two years of baccalaureate study.
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 Anesthesia Nursing are: an undergraduate course in biochemistry (Biochemistry 301 or equivalent), one year of critical care nursing experience, and a successful interview.
7. An additional requirement for the Family Nurse Practitioner specialization 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 Anesthesia Nursing must be received by December 15. Priority is given to those who apply to the FNP by January 15. Students anticipating full-time study should plan to start their course of study in the fall.

### Degree Requirements

Thesis or the non-thesis options are available for all specializations. The thesis option requires completion of 4 credits of 998. The non-thesis option also requires completion of 4 project-related credits, including 997 (2 credits) and 2 credits of 590, 591, nursing electives, and/or electives in a related field. There is no residence requirement.

**Anesthesia Nursing** requires completion of 500; 510; 511; 504; 506; 507; 520; 517; 527; 597; and the 4 thesis or independent study-related credits. Students complete 32 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; 526; 510; 535; 530; 511; 539; 586; 544; 555/560/565; 545; 551; (6) electives; and 2 credits of 997 independent study and 2 credits of 590: Directed Study or 4 credits of 998 thesis.

**Family Nurse Practitioner** requires completion of 500; 510; 511; 586; 556; 526; 530; 523; 534; 535; 555; 536; 539; 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 352; PSCI 593; PSCI 551; Econ 575; 8 credits of cognate electives; and the 4 thesis or independent study-related credits.

### Certificates in Nursing

Two certificate programs are being offered including the Family Nurse Practitioner Program and the Anesthesia Nursing Program in the College of Nursing. The certificate programs are offered to nurses with master’s degrees in nursing who may wish additional flexibility in their careers.

### Admission Requirements

1. Master’s degree in nursing.
2. Licensure as a registered nurse in North Dakota.
3. Additional requirement for Anesthesia Nursing are: an undergraduate course in biochemistry (Biochemistry 301 or equivalent), one year of critical care nursing experience, and a successful interview.
4. An additional requirement for the Family Nurse Practitioner is completion of a successful interview.

### Family Nurse Practitioner

A total of 45* or 46* credits is required for the Family Nurse Practitioner Certificate Program. These courses meet the requirements of the American Nurses Credentialing Center. The following courses are required.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>N510</td>
<td>Advanced Physiology/Pathophysiology I</td>
<td>3</td>
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<tr>
<td>N511</td>
<td>Advanced Physiology/Pathophysiology II</td>
<td>3</td>
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<tr>
<td>N523</td>
<td>Health Promotion</td>
<td></td>
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<tr>
<td>N532</td>
<td>Family Nursing: Theory, Research &amp; Practice</td>
<td>3</td>
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<tr>
<td>N534</td>
<td>Specialization I: Health Conditions</td>
<td>3</td>
</tr>
<tr>
<td>N535</td>
<td>Drug Therapy I</td>
<td>3</td>
</tr>
<tr>
<td>N536</td>
<td>Specialization II: Health Conditions</td>
<td>4</td>
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<tr>
<td>N539</td>
<td>Drug Therapy II</td>
<td>2</td>
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<tr>
<td>N555</td>
<td>Role Dimensions: Seminar and Practicum</td>
<td>3</td>
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<tr>
<td>N556</td>
<td>Epidemiology</td>
<td>3</td>
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<tr>
<td>N596</td>
<td>Advanced Health Assessment</td>
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<tr>
<td>N597</td>
<td>Practicum I</td>
<td>4</td>
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<td>N597</td>
<td>Practicum II</td>
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<td>N597</td>
<td>Practicum III</td>
<td>5</td>
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<tr>
<td>Total Credits</td>
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<td>45-46</td>
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*Students who have previously completed N555 will enroll in N590: Independent Study for 2 credit hours.

### Anesthesia Nursing

A total of 56 credits are required for the Anesthesia Nursing Certificate Program. 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
N507 Anesthesia Seminar & Clinical Practicum I ........ 4 credits
N510 Advanced Physiology/Pathophysiology I ......... 3 credits
N514 Advanced Physiology/Pathophysiology II ...... 3 credits
N517 Anesthesia Seminar & Clinical Practicum II ...... 4 credits
N527 Anesthesia Seminar & Clinical Practicum III ...... 4 credits
N597 Advanced Clinical Practicum .......................... 32 credits
Total Credits .................................................. 36 credits

Courses

500. Theories and Concepts in Nursing. 3 credits. The focus of this course is on analysis of current nursing 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. Pharmacodynamic and pharmacokinetic principles with a focus on clinical anesthesia practice. Physiologic systems and drug classifications are used; emphasis on therapeutic use, side effects, drug interactions, and contraindications of drugs used for intravenous anesthesia induction inhalation, and balanced anesthesia maintenance. Pediatric and geriatric variations will be addressed.


507. Anesthesia Seminar & Clinical Practicum. 4 credits. Corequisites: NURS 500 Theoretical Principles; NURS 530 Research; NURS 540 Pathophysiology. A study of basic principles of anesthesia, physical and chemical concepts related to anesthesia, and an introduction to pathophysiologic concepts applied to nursing problems in the surgery/anesthesia setting. Pathophysiologic/developmental concepts, theory, and research findings are utilized as appropriate in the classroom and applied in clinical practice through the process of diagnostic reasoning. Analysis, integration, and utilization of research findings to improve patient care are emphasized. Includes eight hours of clinical or laboratory practice experience weekly.

510. Advanced Physiology/Pathophysiology I. 3 credits. Prerequisites: NURS 510 or consent of instructor. Continuation of NURS 510. Physiologic and pathophysiologic functions of the human body and its organs, both separately and integrated in whole activities.

511. Advanced Physiology/Pathophysiology II. 3 credits. Prerequisites: NURS 505. Continuation of NURS 510. Advanced physiologic and pathophysiologic functions of the human body and its organs systems, both separately and integrated in whole activities.

517. Anesthesia Seminar & Clinical Practicum II. 4 credits. Prerequisites: NURS 507, pre- or corequisite: NURS 510 Pathophysiology. Co-requisites: Physiology. Students are introduced to the professional aspects of anesthesia and role dimensions of advanced nursing practice based on theory, research, and practice perspectives. Professional aspects of anesthesia and role responsibilities of advanced nursing practice are consistent with the AANA Scope of Nursing Practice, Standards of Nursing Practice, and the AANA Scope and Standards for Nurse Anesthesia Practice are identified. Leadership, practice management, and influences in health care policy are emphasized. The course requires consent of instructor, and is designed to prepare advanced nursing practice roles. Advanced anesthesia principles are applied to geriatric, pediatric, obstetric, and selected specialty surgery clients requiring general or regional anesthesia. Concepts are applied in a variety of clinical situations. Includes eight hours clinical or laboratory practice experience weekly.

523. Health Promotion Through the Lifespan. 3 credits. Prerequisites: NURS 556 and 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 & Clinical Practicum III. 4 credits. Prerequisites: NURS 517. The role of evaluation and analysis of the management of patients with complex co-existing diseases. Exploration and determination of various anesthesia care modalities to maximize patient care are presented. Economic, ethical, and legal dilemmas facing nurse and anesthesia providers are explored. The course provides students the opportunity to examine, promote, or defend various economic, ethical, legal aspects of advanced nursing practice. Includes a clinical/laboratory component.

530. Research Design and Methods in Nursing. 3 credits. 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-unit in health and illness across the lifespan.

534. Specialization in Family Nurse Practitioner: I. Management of Health Conditions in Primary Care. 3 credits. Prerequisite: NURS 523. Clinical decision making skills are developed in the diagnosis and management of acute and chronic health conditions throughout the lifespan. Health promotion, disease prevention, health maintenance, and restoration are emphasized.

535. Drug Therapy I for Advanced Nursing Practice: Common Health Conditions. 2 credits. Prerequisites: NURS 510 and NURS 506, or consent of instructor. Pharmacological agents utilized to treat common acute and chronic health problems are explored in depth. The course focus is on advanced nursing practice roles related to the prescription, pharmacological and therapeutic applications of the drugs.

536. Specialization in Family Nurse Practitioner: II. Management of Health Conditions in Primary Care. 4 credits. Prerequisites: NURS 534 and NURS 555. The focus of this course is on the development of clinical competency in the management of common acute and chronic conditions in all age groups. Concepts from the basic and social sciences are applied in developing intervention strategies. The role of the FNP as case manager is emphasized.

537. Graduate Cooperative Education. Credits 1-3. The focus is upon experience in advanced nursing practice integrating theory, research, and advanced practice in a specific area of nursing. Course overview: the purpose of this course is to provide the graduate nursing student with advanced practice experience as an employee in a health care agency and to evaluate that experience in relation to their educational program.

539. Drug Therapy II for Advanced Nursing Practice: Common Health Conditions. 2 credits. Prerequisites: NURS 535 or consent of instructor. Pharmacological agents utilized to treat common acute and chronic health problems are explored in depth. The course focus is on advanced nursing practice roles related to prescription, pharmacological and therapeutic applications of the drugs.

544. CNS in Nursing Therapeutics I, II. 4 credits. Prerequisites and Corequisites: NURS 500, 526, 530, 535, 539, 548, 557, 558. This course focuses on clinical nurse practitioners’ care of clients in diverse clinical settings, both acute care and community based. Developmental, physiological, and psychosocial concepts, theory and research findings are utilized 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. CNS in Nursing Therapeutics II. 4 credits. Prerequisites: NURS 544. 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 outcomes. The course builds on the concepts explored in Nursing Therapeutics I.

551. Case Management for Health Care. 3 credits. This interdisciplinary course provides an introduction to and experience in developing case management techniques to broaden and strengthen the role of the provider in health care.

553. Role Dimensions of Advanced Nursing Practice: Seminar and Practicum. Pre- or corequisites: NURS 514, 577, or 580, or consent of instructor. The focus of this course is role dimensions inherent in clinical nursing specialization. Theory and research-based content enhance the graduate student’s knowledge for directing care, providing leadership, and developing advanced nursing practice roles. A clinical/practicum component is included.

556. Epidemiology. 3 credits. Concepts and methods for the study of patterns of health and disease in populations.

560. Nursing Administration: Practicum and Seminar. 3 credits. Prerequisites: NURS 577 or 580, or consent of instructor. This course focuses on administrative theory, organizational behavior, and the practice of nursing administration.

562. Health Administration Practicum and Seminar. 6 credits. Prerequisites: NURS 552, Law 291 or consent of instructor. This is a required course within the Health Administration specialization is on the application of theoretical, research based, and experiential knowledge related to the administration of a health care delivery organization or an association within the health care field.

565. Teaching Practicum and Seminar. 3 credits. Prerequisites: NURS 577 or 580, or consent of instructor. This course focuses on educational concepts and strategies pertinent to education in nursing.

566. Advanced Health Assessment Across the Lifespan. 3 credits. Prerequisites: Completion of an undergraduate course in health assessment techniques and NURS 510 or its equivalent, or consent of the instructor. This course is designed to prepare graduate students for health assessment, disease prevention, health maintenance, and restoration. 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 credits. 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 research-driven decision making.

599. Directed Studies. 1 to 3 credits. Prerequisites: 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.

599. Readings in Nursing. 1 to 3 credits. Prerequisites: Consent of instructor. Readings in selected nursing/human topics with student interests and needs.

599. Advanced Clinical Practicum. 1 to 12 credits/repeatable to 32. This clinical practicum course provides the student with the opportunity to obtain extended
Pharmacology and Toxicology

Professors Borg, Clarens, Ebadi (Chair), Feldkamp, Murphy, Porter, Stratford

Program Description

The Department offers graduate programs in pharmacology and toxicology leading to the M.S. (thesis and non-thesis options), Ph.D., and M.D./Ph.D. degrees. Students who complete the program will be well prepared for a diversity of research and other professional careers in academia, industry, and government. Departmental research programs specialize in a number of areas of pharmacology and toxicology. Research programs focus upon molecular and cellular aspects of biomedical research. Specific details are available from the department.

Pharmacology and toxicology are disciplines that focus upon the interaction of drugs and other chemicals with biological systems ranging from individual molecules, to cells, to tissues, to organ systems and to the whole organism. The two disciplines are a continuum incorporating the therapeutic to toxic effect of any drug or chemical. Our department programs incorporate both pharmacology and toxicology, and graduates are well trained to accept employment in either or both disciplines. Much of our research and curriculum also incorporate basic concepts of molecular biology, genetics, biochemistry, physiology, and other biomedical sciences, providing significant flexibility for our graduates.

Admission Requirements

1. Successful completion of undergraduate courses in biology, college algebra and chemistry, including organic chemistry.
2. Undergraduate courses in analytical chemistry, biochemistry, calculus, genetics, physiology, or statistics recommended.
3. Overall GPA of at least 3.0.
4. Graduate Record Examination—General Test or MCAT (Medical College Admission Test)
5. Students with a bachelor’s degree may be admitted directly into the Ph.D. program.

Financial Assistance

Many graduate students in the department, except those electing the non-thesis M.S. program, are supported by Graduate Research Assistant- ships with waiver of tuition and fees. Applicants are encouraged to complete their applications as early as possible to assure full consideration for financial assistance.

Degree Requirements

Master of Science (thesis or non-thesis)

1. Average of 40-50 hours of graduate credit.
3. For thesis option—Pharmacology and Toxicology 590 and 998.
4. For non-thesis option—Pharmacology and Toxicology 997, and a Special Topics or equivalent elective.
5. Minor or cognate—normally fulfilled with BIMD 510.
6. May include a pharmacology or toxicology emphasis.

Doctor of Philosophy

1. All course requirements for the master’s degree (thesis option), except 998.
2. Pharmacology and Toxicology 511 and 999.
3. Scholarly tool—Normally Biology 470 or equivalent.
4. Minor or cognate—normally met by Biochemistry and Molecular Biology 500 and 510.
5. May include a pharmacology or toxicology emphasis.

M.D./Ph.D. Program

The department also participates in the M.D./Ph.D. program. For further details, see page 188.

Courses

BIMD 500. Cellular and Molecular Foundations of Biomedical Science, 7 credits. Prerequisite: A) one year of organic chemistry or B) one semester of organic chemistry and one course in biochemistry or cell biology or C) permission of course director. The focus of this interdisciplinary course is to present areas that are fundamental to all biomedical science graduate programs. Emphasis will be on developing a solid grounding in biochemistry, cell biology and molecular biology with themes covering proteins, metabolism, information flow, vectors, membranes, cell signaling, cell shape and movement, cell growth and division, and immunology.

BIMD 510. Basic Biomedical Statistics, 2 credits. Prerequisites: BIMD 500 or permission of course director. A series of lectures and discussions designed to introduce 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 512. Seminars in Biomedical Sciences, 1 credit. Corequisite: BIMD 500 or permission of course director. Students will attend a weekly school-wide seminar series. Students will further explore aspects of scientific literature and fundamentals of scientific writing, and have opportunities to interact with intramural seminar speakers.

BIMD 513. Seminars in Biomedical Sciences, 1 credit. Prerequisites: BIMD 512 or permission of course director. 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 presentation.

*501. Medical Pharmacology/General Principles and Toxicology, 1 credit. Prerequisite: Biochemistry and Molecular Biology 301 or equivalent. Introductory presentation of the basic principles of pharmacology and toxicology, including pharmacodynamics, pharmacokinetics, pharmacogenetics, drug-drug interactions, and drug and chemical toxicity. Fall Semester.

*502. Medical Pharmacology/Autonomic Nervous System, 1 credit. Pre- or corequisites: Physiology 301 and PhTx 501 or equivalent. Basic pharmacology of the drugs affecting the autonomic nervous system including mechanisms of action, pharmacokinetics, adverse reactions, and clinical uses. Fall Semester.

*503. Medical Pharmacology/Chemotherapy of Infectious and Neoplastic Diseases, 1 credit. Pre- or corequisites: PhTx 501 and 502 or equivalent. Basic pharmacology of drugs used in the treatment of infectious diseases and cancer, including mechanisms of action, pharmacokinetics, adverse reactions, and clinical uses. Fall Semester.

*504. Medical Pharmacology/Cardiovascular System, 1 credit. Pre- or corequisites: PhTx 501 and 502 or equivalent. Basic pharmacology of drugs affecting the cardiovascular system including mechanisms of action, pharmacokinetics, adverse reactions, and clinical uses. Spring Semester.

*505. Medical Pharmacology/Endocrine and Gastrointestinal System, 1 credit. Prerequisites: PhTx 501 and 502 or equivalent. Basic pharmacology of drugs affecting the endocrine and gastrointestinal systems including mechanisms of action, pharmacokinetics, adverse reactions, and clinical uses. Spring Semester.

*506. Medical Pharmacology/Respiratory and Renal System, 1 credit. Prerequisites: PhTx 501, 502, and 504 or equivalent. Basic pharmacology of drugs affecting the respiratory and renal systems including mechanisms of action, pharmacokinetics, adverse reactions, and clinical uses. Spring Semester.

*507. Medical Pharmacology/Central Nervous System and Musculoskeletal System, 2 credits. Prerequisites: PhTx 501 and 502 or equivalent. Basic pharmacology of drugs affecting the central nervous system and the musculoskeletal system including mechanisms of action, pharmacokinetics, adverse reactions, and clinical uses. Spring Semester.

511. Biochemical/Molecular Mechanisms of Pharmacology and Toxicology, 3 to 5 credits. Prerequisites: Biochemistry and Molecular Biology 500 or 501 and Physiology 301. Fundamental concepts of drug receptor interactions, dose-response relationships, pharmacodynamics, pharmacokinetics, pharmacogenetics, and toxicology. Biochemical and molecular mechanisms are emphasized. Consent of instructor required.

512. Special Topics in Pharmacology and Toxicology, 2 credits. An in-depth coverage of a particular topic chosen by the instructor. Topics and instructors vary semester to semester. Repeatable to eight credits. Consent of instructor required.

521. Seminar in Pharmacology and Toxicology, 1 credit. A series of presentations on original research, literature reviews and subspecialty areas in biomedical science given by faculty and students. Repeatable to eight credits. Consent of instructor required.
6. Applications must be made no later than March 1 of the year the student wishes to enter the professional program.

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 (8 semester credits), chemistry (8 semester credits), anatomy (3 semester credits), physics (8 semester credits), psychology (7 semester credits—including Intro and Developmental), and physiology (4 semester credits).

2. Reference letters, a personal interview, and other personal qualifications are also considered prior to final acceptance.

3. Acceptance by the Office of Admissions does not constitute acceptance into the professional program in Physical Therapy.

Degree Requirements

1. The professional education component of the M.P.T. will require three academic years and one summer session 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 affiliation during Semester I of the second year unless he/she attains a letter grade of at least “C” in their major courses.

3. Acceptance into the Graduate School requires:
   a. Acceptance into the professional P.T. program.
   b. Successful completion of professional education years 1 and 2 and each of the summer sessions between those years.
   c. Completion of the Graduate Record Examination, the Graduate School application forms and submission of undergraduate transcripts.
   d. Letter of endorsement from the Chair of Physical Therapy which dictates automatic advancement in status and assures that the student will not be placed in double jeopardy.

4. Students in the professional program should be aware that there are special requirements for clinical uniforms and professional liability insurance that 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, during the full-time clinical affiliation semesters; the majority of these affiliation sites are at geographical locations other than the City of Grand Forks.

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.

Master of Physical Therapy

I. Graduation Requirements

See page 181 of this catalog for a description of the requirements for the non-thesis option for master’s degrees, including the Independent Study requirements and Comprehensive Examinations.

II. The following Curriculum:

Pre-Physical Therapy

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110, 120 or 125 &amp; COMM 110</td>
<td>Communication</td>
<td>9</td>
</tr>
<tr>
<td>BIOL 150, 151</td>
<td>Introduction to Biology</td>
<td>8</td>
</tr>
<tr>
<td>CHEM 121, 122</td>
<td>Gen. Chemistry I, II (Qual. Analysis)</td>
<td>8</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Intro to Sociology (or approved substitute)</td>
<td>3</td>
</tr>
<tr>
<td>PSY 111</td>
<td>Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 161, 162</td>
<td>Intro to College Physics</td>
<td>8</td>
</tr>
<tr>
<td>ANAT 204</td>
<td>Anatomy for Paramedical Personnel</td>
<td>3</td>
</tr>
<tr>
<td>PHY 301</td>
<td>Mechanics of Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>PSY 250</td>
<td>Development Psychology</td>
<td>4</td>
</tr>
<tr>
<td>PT 101</td>
<td>Orientation to Physical Therapy</td>
<td>1</td>
</tr>
<tr>
<td>Electives (required)</td>
<td>3-8</td>
<td></td>
</tr>
</tbody>
</table>

Professional Program - Physical Therapy

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT 309, 310</td>
<td>Medical Sciences I, II</td>
</tr>
<tr>
<td>PT 314</td>
<td>Introduction to Patient Care Techniques</td>
</tr>
<tr>
<td>PT 318</td>
<td>Techniques I. Theory and Techniques of Massage</td>
</tr>
<tr>
<td>PT 319</td>
<td>Techniques II. Theory and Techniques</td>
</tr>
<tr>
<td>PT 322</td>
<td>Thermo-Photo-Hydrotherapy</td>
</tr>
<tr>
<td>PT 237</td>
<td>Anatomy for Physical Therapy</td>
</tr>
</tbody>
</table>
University of North Dakota

PT 324  Professional Communication and Behavior (.1)
PT 326  Introduction to Manual Therapy (.2)
PSY 270  Abnormal Psychology (.3)
PT 412  Muscle Function in Health and Disease (.4)
PT 413  Theory and Technique of Therapeutic Exercise I: Mobility-Strength-Endurance (.3)
PT 414  Pediatric Physical Therapy (.2)
PT 415  Theory and Technique of Therapeutic Exercise II: Muscle Control and Coordination (.3)
PT 417  Theory and Technique of Therapeutic Exercise III: Tests and Measurements—Specialized Exercise (.4)
PT 419  Techniques III: Theory and Technique of Electrotherapy and Electrodiagnosis (.2)
PT 421  Administration—Physical Therapy (.3)
PT 423  Neuroscience for Physical Therapy (.3)
PT 425  Sports-Physical Therapy (.2)
PT 430  Cardiopulmonary Physical Therapy (.3)
PT 482  Clinic I: Clinical Practice (.14)
PT 488  Research I: Clinical Research (.1)
PT 490  Special Topics (.1-4)
PT 491  Independent Study in Physical Therapy (.1-4)
PT 493  Psychological Aspects of Disability (.2)
PT 494  Research II: Clinical Conference and Paper (.1-3)
PT 511*  Applied Movement Science and Rehabilitation Procedures (.3)
EFR 515*  Statistics I (or substitute) (.3)
PT 525*  Techniques IV: Clinical Evaluation (.3)
PT 526*  Techniques V: Joint Mobilization/Soft Tissue Treatment (.2)
PT 534  Industrial Rehabilitation/Occupational Medicine (.2)
PT 535  Gerontology Seminar (.2)
PT 537  Strategies for Early Intervention (.2)
PT 558  Advanced Pediatrics Assessment and Treatment Techniques (.2)
PT 549  Advanced Applied Anatomy/Clinical Kinesiology (.2)
PT 552  Clinic II: Clinical Practice (.7-14)
PT 561*  Seminar: Physical Therapy (may repeat 4 times) (.1-4)
PT 562  Readings: Physical Therapy (.1-3)
PT 570  Patient Education Techniques—Physical Therapy (.2)
PT 572  Teaching Experience in Physical Therapy (may repeat 3 times)
PT 582  Instrumentation for Physical Therapy (.2)
PT 590*  Directed Studies/Clinical Concepts (.1-12)
PT 995*  Scholarly Project (.2)
PT 996  Containing Enrollment/Physical Therapy (Arr.)

Core courses in M.P.T. Graduate Component: Minimum of 32 credits.

The required courses will be offered in the following sequence.

**Professional Year 01—Fall Semester (15 cr.)**

PT 309  Medical Sciences I (.3)
PT 314  Introduction to Patient Care Techniques (.2)
PT 318  Techniques I: Theory and Technique of Massage (.2)
PT 322  Anatomy for Physical Therapy (.5)
PT 423  Neuroscience for Physical Therapy (.3)

**Professional Year 01—Spring Semester (19 cr.)**

PT 310  Medical Sciences 110 (.3)
PT 324  Professional Communication and Behavior (.1)
PT 326  Introduction to Manual Therapy (.2)
PT 412  Muscle Function in Health and Disease (.4)
PT 414  Pediatric Physical Therapy (.2)
PT 415  Theory and Technique of Therapeutic Exercise I: Mobility-Strength-Endurance (.3)
PT 417  Theory and Technique of Therapeutic Exercise III: Tests and Measurements—Specialized Exercise (.4)

**Professional Year 01—Summer Session (9 cr.)**

PT 319  Techniques II: Theory and Technique of Thermo-Photo-Hydrotherapy (.4)
PT 413  Theory and Technique of Therapeutic Exercise I: Mobility-Strength-Endurance (.3)
PT 419  Techniques III: Theory and Technique of Electrotherapy and Electrodiagnosis (.2)

**Professional Year 02—Fall Semester (15 cr.)**

PT 482  Clinic I: Clinical Practice (.14)
PT 488  Research I: Clinical Research (.1)

**Professional Year 02—Spring Semester (14-17 cr.)**

Student must complete GRE and Application to UND Graduate School during this semester.

PT 421  Administration—Physical Therapy (.3)
PT 430  Cardiopulmonary Physical Therapy (.3)
PT 493  Psychological Aspects of Disability (.2)
PT 494  Research II: Clinical Paper (.2)
PT 526  Techniques V: Joint Mobilization/Soft Tissue Treatment (.2)
PSY 270*  Abnormal Psychology (.3)
EFR 515  Statistics I (.3)
Electives (.0-3)

*Note: many of the students take PSY 270 with their pre-physical therapy coursework.

**Professional Year 03—Fall Semester (12-16 cr.)**

PT 511  Applied Movement Science and Rehabilitation Procedures (.3)
PT 525  Techniques IV: Clinical Evaluation (.5)
PT 561  Seminar: Physical Therapy (.1)
PT 590  Directed Studies/Clinical Concepts (.1-12)
Electives (.4-8)

**Professional Year 03—Spring Semester (16 cr.)**

PT 552  Clinic II: Clinical Practice (.7-14)
PT 590  Directed Studies/Clinical Concepts (.0-12)
PT 995  Scholarly Project (.2)

**Courses**


2. **Medical Sciences I, II, III, IV**, 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.

3. **Introduction to Patient Care Techniques**, 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Theory and practical introduction 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.


5. **Techniques II: Theory and Technique of Thermo-Photo-Hydrotherapy**, 4 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.


7. **Professional Communication and Behavior**, 1 credit. Prerequisite: Registered in Professional Physical TherapY, Curriculum. Lecture and practical study in interprofessional and interpersonal communication including professional behavior, ethics, patient education, scientific writing, and written documentation.


10. **Therapy and Technique of Therapeutic Exercise I: Mobility-Strength-Endurance**, 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Lecture and laboratory work in therapeutic exercise to increase and maintain mobility, strength, and endurance in the human body. Laboratory.

11. **Therapy and Technique of Therapeutic Exercise I: Therapeutic Exercise**, 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. This course is designed to present pediatric physical therapy theory and current physical therapy practice procedures to prepare physical therapy students to work with pediatric patients and their families as early intervention service providers. Components of the course include both didactic work and practical application through lecture classes, laboratory exercises, field experiences, and collaborative group assignments. Course materials focus on characteristics of disabling conditions that influence growth and development, with a specific emphasis on motor skills acquisition and therapeutic intervention. Content material will be presented with an emphasis on collaborative service provision within an interdisciplinary approach.

12. **Therapy and Technique of Therapeutic Exercise II: Control and Coordination**, 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum.
Curriculum. Lecture and laboratory work in therapeutic exercise to establish and maintain muscular control and coordination, including muscle re-education, facilitation, and relaxation. Laboratory.

417. Theory and Test Technique of Therapeutic Exercise III: Test and Measurements. 4 credits. Prerequisite: Registered in Professional Physical Therapy. Specific tests and measurements not covered in the other areas including tests and measurements of muscular skeletal and neurological systems as they relate to PT. Laboratory.

419. Techniques III: Theory and Technique of Electrotherapy and Electrodiagnosis. 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Theory and application of the use of low voltage electrical currents in physical therapy, including strength duration curves, electromyography, and nerve conduction velocity. Laboratory.

421. Administration—Physical Therapy. 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Lecture/discussion and seminar formats used to explore concepts of administration procedures as applied to Physical Therapy and the health care system.

423. Neuroscience for Physical Therapy. 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Structure and function of the human nervous system including clinical application relevant to physical therapy practice.

425. Sports Physical Therapy. 2 credits. Prerequisites: Registered in Professional Physical Therapy Curriculum. The theory and practice of sports-related injury management with emphasis upon pre-participation screening, emergency/trauma evaluation, the principles of support devices, and accelerated rehabilitation techniques.

430. Cardiopulmonary Physical Therapy. 3 credits. Prerequisites: Registered in the Professional Physical Therapy Curriculum. This course is designed to expand the theoretical understanding and clinical application of cardiopulmonary physical therapy examination, evaluation, diagnosis, prognosis, intervention, and outcomes. 8 weeks.

431. Clinic I: Clinical Practice. 14 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Full-time clinical practice in selected hospital affiliations (38 weeks), in and out of City of Grand Forks.

490. Special Topics. 1 to 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Introduction and investigation of advanced clinical procedures and topics. Topics discussed will be dictated by student and faculty interests.

491. Independent Study in Physical Therapy. 1 to 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Research and independent study in a specialized area of Physical Therapy.

511. Applied Movement Science and Rehabilitation Procedures. 3 credits. Prerequisites: Registered in professional physical therapy 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, ADLs, as well as community mobility and governmental services. Laboratory.

525. Techniques IV: Clinical Evaluation. 3 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Specific clinical evaluation techniques including neurological testing, soft tissue assessment, joint mobility, and related written documentation of results.


534. Industrial Rehabilitation/Occupational Medicine. 2 credits. The integration of medical, industrial, and legal points of view in the prevention and management of work related injuries.

535. Gerontology Seminar. 2 credits. Examine the factors and forces that affect life quality in the later years. The physiological, psychological, and sociological aspects of aging will be considered, including those influences in the cultural context that enhance and impede continued growth of the person.

537. Strategies for Early Intervention. 2 credits. Prerequisite: PT 415. This course is designed to review current practices in early intervention. Course materials will foster opportunities to explore and implement standardized and criterion-referenced evaluation instruments to identify need areas for treatment. In addition, students will design treatment programs for children with disabilities by integrating current therapeutic techniques with efficacy studies.

549. Advanced Applied Anatomy/ Clinical Kinesiology. 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Study of applied anatomy and its importance to research and clinical application, particularly as related to Physical Therapy.

552. Clinic II: Clinical Practice. 7 to 14 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Full-time clinical practice affiliation in selected Physical Therapy provider centers, in and out of City of Grand Forks. Two nine-week segments, one of which will be related to student area of Directed Studies, the other either research or additional clinical.

561. Seminar: Physical Therapy. 1 to 4 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. This course serves to focus student attention toward graduate study in Physical Therapy. Explore and discuss areas of interest for student and faculty. May repeat to 4 credits maximum.


576. Patient Education Techniques—Physical Therapy. 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. A review of the teaching/learning process with emphasis on techniques targeted to enhance patient involvement in their rehabilitation and physical therapeutic processes. Thirty hours of lecture, discussion, and project per semester.


582. Instrumentation for Physical Therapy. 2 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. The application of existing electrical and mechanical instrumentation and techniques to research and clinical practice in physical therapy.

590. Directed Studies/ Clinical Concepts. 1 to 12 credits. Prerequisite: 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 with specialty and/or recognized expertise in the area of interest. Study may include library research, clinical research, discussion/seminars, projects and directed clinical experience. Serves as the basis for PT 997. Independent Study Report.

990. Continuing Education Workshops in Physical Therapy. 1 to 8 credits. Prerequisite: Registered in Professional Physical Therapy Curriculum. Credit in Physical Therapy may be granted for workshops, conferences, institutes, or other types of short-term activities, provided they have been approved for credit by the Chairperson of Physical Therapy and the dean of the Graduate School. Written report of the activity is required. A one-week workshop shall carry no more than 1 semester hour of credit.

995. Scholarly Project. 2 credits. Prerequisite: registered in Professional Physical Therapy Curriculum. Designing, implementing and reporting the results of a collaborative research project pertinent to physical therapy. Students will complete forms for the use of human subjects, acquire proficiency with instrumentation used in the project, perform statistical analysis, and provide a written and oral report to the faculty.

996. Continuing Enrollment/Physical Therapy. Credit arranged.
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. Successfully completed a basic core of courses which includes: classical mechanics, quantum mechanics, methods of theoretical physics, classical electricity and magnetism.

2. Completion of a research project and the writing of a 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 course work 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 course work, 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. Method 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.

590. Research. Credit arranged

428. Modern Physics Laboratory. 2 credits.

431. Introductory Quantum Physics. 3 credits.

434. Nuclear Physics. 3 credits.

437. Introductory Solid State Physics. 3 credits.

460. Introduction to Astrophysics. 3 credits.

490. Special Problems. 1 to 3 credits.

Physiology

Professors Brown-Borg (Graduate Director), Combs, Doze, Ebadi (Chair), Haselton, McCleary, Ren, Vari

Program Description

The degrees of Master of Science and Doctor of Philosophy are offered by the department of Physiology.

The goal of the physiology graduate program is to educate students in areas of research and teaching. The graduate is prepared to teach basic medical, graduate, and undergraduate physiology at a university, medical school, or college. The graduate is also trained and prepared to conduct and direct basic mammalian physiologic laboratory research in educational institutions, industry, foundations, and/or government.

Admission Requirements

Master of Science

1. Chemistry—8 credit hours, including organic/and or biochemistry (2 semesters equivalent to UND 300 or above) and the courses which normally precede organic chemistry. A laboratory is not required.

2. Physics—8 credit hours, at a 200 level minimum.

3. Biology—one course beyond the introductory level—introductory biology is considered one course of two semesters, but may include anatomy or embryology (101/102 over two semesters with one additional course at the 300 level or above).

4. Grade point average for all undergraduate courses—2.75 minimum. Grade point average for the last two years (undergraduate)—3.00 minimum. Grade point average for biological and physical science courses — 3.00 minimum.

5. Graduate Record Examination—General Test. (Minimum overall average — upper 50th percentile.)

Doctor of Philosophy

1. Master’s degree or equivalent and an overall GPA of at least 3.50 for all previous graduate work.

2. Minimum GRE composite score on the General test (verbal, quantitative, and analytic) and Advanced test (biology or chemistry or cognate) score which places the candidate in the upper 50th percentile on both.

Degree Requirements
Master of Science

1. Minimum of 20 credits of graduate work in the major area and a
minimum of 10 credits in a cognate drawn from related areas;
however, Biomed 500, must be included in the cognate.
2. Students must prepare a thesis based on results from experimental
research.
3. Experience in teaching physiology is required before the degree is
granted.
4. After approximately one year of graduate work for the Master of
Science degree, a student may request admission to the Doctor of
Philosophy program. Students may complete course work and bypass
the Masters Degree, proceeding straight to the Ph.D., by taking a
qualifying examination. The qualifying examination will consist of
the preparation and defense of a research proposal on their intended
studies. It is suggested that the proposal be completed on NIH forms.

Doctor of Philosophy

1. Acceptable knowledge of physiology, anatomy, biochemistry,
pharmacology, chemistry, physics, mathematics, instrumentation,
experimental design, and computer techniques.
2. Teaching experience is required and can be obtained within the
department.
3. Statistics (Biol 470 or EFR 515).
4. One of the following areas must be presented as a scholarly tool for
the Ph.D. degree:
   a. Foreign language
   b. Statistics
   c. Computer Programming, or
d. Statistics and computer programming.
5. Complete a dissertation based on the results of original laboratory
research.
6. Students may select a cognate or a minor from related fields.

M.D./Ph.D. Program

The department also participates in the M.D./Ph.D. program. For
further details see page 188.

Courses

502. Physiology of the Central Nervous System. 2 credits. Prerequisites: Physiology 523 and/or consent of instructor. The emphasis in this course is the
correlation of the structure, function and chemistry of the central nervous system. Of particular interest are the relationships of behavioral changes to electrophysiological
and chemical changes.
503. Advanced Physiology. Credits arranged. Prerequisite: Physiology 523 and/or consent of instructor.
504. Introduction to Surgical Techniques. 2 credits. Three to six laboratory
hours a week. Prerequisite: consent of instructor.
512. Seminar in Physiology, 1 credit. (All students must enroll when seminar
series is offered.)
523. Medical Physiology for Graduate Students. 5 credits. Consent of
instructor. Lecture and discussion format. Survey of human physiology with attention
to integrative, systems based biology. Does not include neurophysiology (see PHY
502).
525. Renal Physiology. 1 to 3 credits. Prerequisites: Physiology 523 and/or
consent of instructor.
526. Respiratory Physiology. 1 to 3 credits. Prerequisites: Physiology 523 and/or
consent of instructor.
527. Neurophysiology. 1 to 3 credits. Prerequisite: consent of instructor.
528. Endocrinology. 1 to 3 credits. Prerequisites Physiology 523 and/or consent
of instructor.
529. Cardiovascular Physiology. 1 to 3 credits. Prerequisites Physiology 523.
590. Problems. Credits arranged.
591. Research in Physiology. Credits arranged.
BIMD 500. Cellular and Molecular Foundations of Biomedical Science, 7
credits. Prerequisite: A) one year of organic chemistry or B) one semester of organic
chemistry and one course in biochemistry or cell biology or C) permission of course
director. The focus of this interdepartmental team-taught course will be in areas that
are fundamental to all biomedical science graduate programs. Emphasis will be on
developing a solid grounding in biochemistry, cell biology and molecular biology with
themes covering proteins, metabolism, information flow, vectors, membranes, cell
signaling, cell shape and movement, cell growth and division, and immunology.
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.
these projects to the General-Experimental faculty. As a general principle, the projects will address areas that are professionally relevant for the student, but in which the student does not already have an extensive background. The General-Experimental faculty will have responsibility for approving the proposals and for grading the finished projects. Recommendation for advancement to the Doctoral Candidacy upon completion of the projects, is a function of the entire General-Experimental faculty.

c. Normal progress will be demonstrated by completing the three projects by the end of the third year of graduate training, or by the end of the first year after being admitted into the Ph.D. program in General-Experimental Psychology.

Minor in Psychology

Graduate students taking major work in other departments and graduate minor work in psychology for a master’s degree should have the equivalent of an undergraduate minor in psychology with the following specific courses: Introduction to Psychology, Developmental Psychology, Abnormal Psychology (or the equivalent). Any of the psychology courses which carry graduate credit are acceptable for the graduate minor.

Graduate students taking major work in another department and minor work in psychology for a doctoral degree, in addition to having the undergraduate preparation noted in the paragraph above, must also have completed one 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.

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 physiological systems, the relationships between behavior and physiology, and the importance of individual differences in physiological responses.

539. Cognitive Psychology. 3 credits. Prerequisite: Graduate status in psychology or permission of instructor. Analysis and discussion of laboratory work of topics covering issues related to memory, attention, problem solving, comprehension, and thinking.

541. Advanced Univariate Statistics. 3 credits. Prerequisite: Graduate standing, college algebra, and elementary statistics. Theory of univariate statistics; application to quantitative data in psychology.

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. An in-depth analysis and discussion of topics covering the entire lifespan, from Genetic and Prenatal influences to Death and Dying.

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. Prerequisites: 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 572 may be earned in conjunction with this course.

573. Theories of Psychotherapy. 3 credits. Prerequisites or corequisite: 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. An in-depth study of the key issues of psychotherapy research with a focus on critical evaluation of the psychotherapy research literature and the development of a 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 by semester basis.

595. Seminar in Psychology. 1 to 3 credits. Prerequisite: consent of instructor.

596. Individual Research. Credits to be arranged.

421. Individual and Group Differences. 2 to 3 credits.

434. Motivation and Emotion. 3 credits.

435. Physiological Psychology. 3 credits.

436. Perception. 4 credits.

450. Child Clinical Psychology. 3 credits.

470. Introduction to Clinical Psychology. 3 credits.

Public Administration

Professors Jendrysik, Jensen, M. Kwet, R. Kwet (Graduate Director), Light, Sum

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 to increase the skills of persons already in the public service. The program achieves these purposes through a multidisciplinary curriculum which requires the students to have a basic understanding of the American political system, instructs the students on the fundamental concepts of public administration, and trains the students to apply basic administrative principles in public management. The department offers 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 policy, administrative services, 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 8 credits may be transferred to UND from other institutions.
5. The following are required courses:
   - PSCI 500 Research Methods 3 credits
   - PSCI 501 Political & Policy Analysis 3 credits
   - PSCI 531 Seminar: Public Administration 3 credits
   - PSCI 580 Administrative Internship* 3 credits
   - PSCI 997 Independent Study 2 credits
   - PSCI Electives 12-21 and/or
   - Up to 9 credits in cognate/elective courses.
   - Total 32-35 credit hours
   *This requirement will be waived for students with at least one year of administrative experience.
6. Students wishing to take a health concentration must take the following courses as part of their 32 credit hours:
   - PSCI 551 Health Administration and Organization 3 credits
   - PSCI 552 Health Policy 3 credits
   - ECON 575 Seminar in Health Economics 3 credits
   - LAW 291 Legal and Ethical Issues in Health Care 3 credits
   (Also offered as Psci 593 Problems in Political Science and Public Administration)
7. A thesis option is also available. See page 180 for 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 Registrar’s Office.

**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 course work 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

**Year One—Seven MPA courses**
- Year Two—Law School
- Year Three—Law School w/two MPA courses*  
- Year Four—Law School w/two MPA courses + Independent Study

*2 MPA course requirements could be met with law courses as electives.

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
- LAW 152 CONSTITUTIONAL LAW
- 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 & LOCAL GOVERNMENT LAW
- LAW 291 POVERTY LAW
- LAW 291 CIVIL RIGHTS
- LAW 291 STATE CONSTITUTIONAL LAW

Or other courses with the approval of the Dean of the Law School

### POLITICAL SCIENCE/PUBLIC ADMINISTRATION
- PSCI 308 INTERGOVERNMENTAL RELATIONS
- PSCI 404 URBAN POLITICS AND ADMINISTRATION
- PSCI 405 POLITICAL BEHAVIOR
- PSCI 502 PROBLEMS IN STATE AND LOCAL GOVERNMENT
- PSCI 508 LEGISLATIVE EXECUTIVE PROCESSES
- PSCI 513 PUBLIC ADMINISTRATION
- PSCI 532 PUBLIC POLICY
- PSCI 535 PUBLIC ORGANIZATIONS
- PSCI 536 PUBLIC PERSONNEL ADMINISTRATION
- PSCI 538 PUBLIC BUDGETING AND FINANCIAL MANAGEMENT
- PSCI 539 ADMINISTRATIVE LAW

Or other courses with the approval of MPA Directors and Graduate Dean

### BSPA/MPA or BA/MPA Program

#### Admission Requirements

1. 3.25 G.P.A. 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 4:
   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 5:
   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 & Health Administration

Three certificate programs are also offered. Each program consists of four three-credit courses. 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 an 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
- PSCI 552 Health Policy (3 credits)
- PSCI 551 Health Organization and Administration (3 credits)
- LAW 291 Legal and Ethical Issues in Health Administration, also offered as PSCI 593 Problems in Political Science & Public Administration: Legal and Ethical Issues in Health Administration (3 credits)
- ECON 575 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
- PSCI 531 Seminar: Public Administration (3 credits)
- PSCI 533 Administrative Ethics in the Public Sector (3 credits)
- PSCI 536 Public Personnel Administration (3 credits)
- PSCI 538 Public Budgeting and Financial Administration (3 credits)
- PSCI 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
- PSCI 500 Research Methods (3 credits)
- PSCI 501 Political and Public Policy Analysis (3 credits)
- PSCI 532 Public Policy (3 credits)
- PSCI 502 Seminar: Problems in State and Local Government (3 credits)
- PSCI 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 300 or consent of instructor. This course focuses on the use of empirical data both to develop theoretical argument 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. Prerequisite: Political Science 402 or consent of instructor. 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.
- 508. Seminar: Legislative and Executive Processes, 3 credits. Description, analysis, and evaluation of the structures, processes, procedures, and positions of the legislative and executive offices in government.
- 511. Seminar: Political Theory, 3 credits. Prerequisite: Political Science 311 or consent of instructor. Study of major political theories and the methodologies employed in their formulation.
- 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 the 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. It will also examine merit systems and contemporary reforms and techniques including TQM and conflict resolution. 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. Orthodoxy 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 6 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.

308. Intergovernmental Relations. 3 credits.

LAW 291. Legal and Ethical Issues in Health Administration (Also offered as PSCI 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.

ECON575. 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, p. 215).

Social Work

Professors Bailey, Haga, Heitkamp, Houston, Jacobsen, Kraft, Muhlhauser, Perry, Stevens, Woehle

Program Description

The Department of Social Work offers a graduate program leading to the Master of Social Work (MSW) degree. This program is accredited by the Council on Social Work Education (CSWE). The program offers a concentration in advanced generalist practice.

The Master of Social Work degree is designed to prepare social workers for employment in a wide variety of human service agencies including family service organizations, child welfare agencies, health and mental health settings, and public social service agencies. The Master of Social Work degree is also appropriate for those social workers who may be planning to eventually enter a doctoral program in social work.

Admission Requirements

1. Minimum standards for admission are:
   a. Ability to communicate in such a manner as to facilitate a helping relationship and the delivery of services.
   b. Mobility sufficient to perform essential social work related activity.
   c. Personal resources (psychological, social and intellectual) that facilitate the use of self in a helping manner in a social work setting.

2. Satisfactory completion of at least 30 semester credit hours of liberal arts courses in such fields as economics, political science, history, literature, sociology, psychology, and philosophy. A course in biology is required.

3. Satisfactory completion of a course in statistics within seven years of admission. Those who do not meet this requirement may be admitted, but will not be allowed to enroll in graduate social work research courses until the requirement is met.

4. Submission of a statement delineating qualifications and reasons for pursuing an MSW degree. This includes:
   a. Motivation for being a social worker,
   b. Values and beliefs as they relate to social work,
   c. Experience with people from diverse social and cultural backgrounds,
   d. Qualities the applicant can bring to the social work profession,
   e. Personal qualities as related to leadership and creativity,
   f. The process of problem solving used to make the decision to enter social services.

5. Submission of references as designated by the Department of Social Work which reveal the applicant’s qualifications for social work and potential for success in social work. References should include:
   a. A direct supervisor of work in a recent job, preferably a social service job,
   b. An undergraduate academic advisor or someone else who is able to evaluate academic work,
   c. A nonrelative who can address potential for the social work profession.

6. A signed statement indicating that the applicant will abide by the National Association of Social Worker’s Code of Ethics and the University of North Dakota Student Code of Conduct.

Advanced Standing

Applicants who have received baccalaureate degrees in social work from CSWE accredited programs within seven years of their acceptance for the MSW program, have taken a required statistics course, and have a GPA of 3.00 or better for that degree may have up to 21 hours of foundation credits waived. Students with CSWE accredited degrees granted more than seven years before acceptance may petition to take challenge examinations in one or more of the foundation courses, except field courses. If all foundation courses, except field, are successfully challenged, foundation field courses will be waived. However, any student taking one or more foundation courses must also take the foundation field courses. Students must have a grade of B of better in foundation courses for which Advanced Standing is required. The foundation courses are:

- SWk 510, Human Behavior in the Social Environment I
- SWk 511, Foundation Social Work Practice
- SWk 512, Foundation Social Work Practice Skills Lab
- SWk 513, Social Welfare Policy I
- SWk 514, Social Work Research I
- SWk 583, Field Instruction Seminar I
- SWk 584, Field Instruction Seminar II
- SWk 586, Field Instruction I
- SWk 587, Field Instruction II

Applicants who believe they are eligible to take challenge examinations should make their intent known to the Coordinator of the MSW program within three weeks of being notified of their acceptance into the MSW program.

Degree Requirements

1. Successful completion, or waiver as described above, of 60 semester
credit hours of courses approved by the social work faculty with at least a 3.00 grade point average.
2. Satisfactory waiver or completion of all foundation courses including SWk510, SWk511, SWk512, SWk513, SWk514, SWk583, SWk584, SWk586, and SWk587.
3. Satisfactory completion of the advanced generalist concentration including SWk 520, SWk 521, SWk 523, SWk 524, SWk 525, SWk 528, SWk 531, SWk 535 or SWk 536, SWk 547, SWk 585, SWk 588, and the specialized portion of the concentration including SWk 561 and four credits of related electives, as well as SWk 997 or SWk 998.
4. Completion of the courses in the recommended sequence unless other arrangements are negotiated.
5. Completion of SWk 586 and SWk 587 or equivalents, and SWk 588 as described in Social Work Field Instruction Manual.
6. Completion of a thesis or independent study.
7. Completion of at least 24 semester credits at UND. Transfer credits must be obtained in a CSWE accredited program, and a maximum of 15 credits will be allowed for transfer. (See General Academic Policies—Transfer of Graduate Credit for additional restrictions.)
8. The development of a program of study early in the semester in which the student first enrolls in concentration courses.

**Thesis Option**
1. Students completing a thesis must establish a Faculty Advisory Committee by the end of the semester in which the student first enrolls in concentration courses.
2. Students completing a thesis must submit an outline of the thesis by the end of the semester in which the student first enrolls in concentration courses.

**Non-Thesis Option**
1. Students completing an independent study must select an advisor and submit an outline of the study by the end of the semester in which the student first enrolls in concentration courses.
2. Students completing an independent study must complete a final comprehensive examination administered by the department.

**Candidacy for the Degree.** Please see page 178 for detailed descriptions of the requirements for Candidacy for both Thesis and Independent Study options.

**Courses**

510. Human Behavior in the Social Environment I. 2 credits. Prerequisites: Formal admission to the MSW program or consent of the instructor. This foundation course uses ecological/social systems theory as the overall conceptual framework. Biopsychosocio-cultural aspects of human development are emphasized, along with a recognition of the reciprocal interactions and transactions of multiple systems that influence human development throughout the life span. A paradigms framework is used for portraying human behavior theory and diversity.

511. Foundation Social Work Practice. 3 credits. Prerequisites: Formal admission to the MSW program. Corequisites: SWk 510. The purpose of this course is to provide the foundation knowledge, values and skills for generalist social work practice. Course components include the problem solving process from a strengths perspective and the use of self appropriate to generalist practitioner. The course presents the content from an ecological system perspective and focuses on intervention with the various micro, midlevel and macro client systems. The course also serves as a basis for advanced generalist social work practice.

512. Foundation Social Work Practice Skills Lab. 2 credits. Prerequisites: Formal admission to the MSW program. Corequisite: SWk 511. The purpose of this course is to provide the opportunity to apply the knowledge and values gained in SWk 511 to simulated case situations. This course focuses on enhancing interpersonal relationship skills necessary for advanced generalist social work practice.

513. Social Welfare Policy I. 2 credits. Prerequisites: Formal admission to the MSW program or consent of the instructor. This course is intended to provide students with a beginning understanding of the institution of social welfare, its historical landmarks, and the values and ideology that influence its formulation. Students will also learn about the composition of the disadvantaged in the United States, and the programs that benefit them. The course will also provide an analytic model to evaluate social welfare policies.

514. Social Work Research I. 2 credits. Prerequisites: Formal admission to the MSW program or consent of the instructor. This course provides an overview of qualitative and quantitative research methods commonly utilized in social work settings. Special emphasis is placed on techniques related to evaluation of professional practice, program evaluation, and research conducted with diverse populations.

520. Human Behavior in the Social Environment II. 2 credits. Prerequisites: SWk 510, advanced standing in the MSW program or consent of the instructor. This course develops the student's understanding of human development and behavior in the context of various paradigms from a strengths perspective. Much of the content will focus on the reciprocal processes between systems, including individuals, families, groups, organizations and communities in the social environment of this region.

521. Advanced Generalist Social Work Practice. 3 credits. Prerequisites: SWk 511 and SWk 512 or advanced standing in the MSW program. The purpose of this course is to provide knowledge, values and skills necessary for social work intervention with diverse populations in this region. As the first course in the advanced generalist practice sequence, the focus of the course will include the intervention roles required across the problem solving process within a strengths, ecological and systemic perspective.

523. Social Welfare Policy II. 2 credits. Prerequisites: SWk 513, advanced standing in the MSW program or consent of instructor. This course provides an in-depth understanding of the social welfare institution, with emphasis on the issues and processes of social policy formulation in the regional context. Policy practice is presented as an important component of social work practice. Students will also learn various models of policy analysis, and the structure and functions of the judiciary and legislature of the United States.

524. Social Work Research II. 2 credits. Prerequisites: SWk 514, advanced standing in the MSW program or consent of instructor. This course is designed to develop an understanding of both qualitative and quantitative data analysis in the context of this region. This course will address the paradigmatic context of social work research. Ethical, epistemological, ontological, methodological and technological issues are included. Statistical procedures and computers are utilized.

525. Proposal Writing. 1 credit. Prerequisites: SWk 514, advanced standing in the MSW program or consent of the instructor. Corequisite or prerequisite: SWk 524. This course addresses skills related to writing proposals for research, program evaluation and practice evaluation. Emphasis is on research and evaluation with the diverse populations of the region. Applications of qualitative or quantitative research methodology, and use of APA style, are required.

531. Social Work Practice with Micro Systems. 3 credits. Prerequisites: SWk 521. The purpose of this course is to provide the social work knowledge, values and skills necessary for advanced generalist social work practice with individuals in groups and families. In particular, this course is designed to provide the knowledge about intervention models and clinical supervision used in social work practice with individuals, families, and personal groups. An opportunity for skills development will be provided in the practice lab.

535. Social Work Practice with Communities. 2 credits. Co-requisite or prerequisite: SWk 531. This course provides advanced generalist practice directed toward neighborhood, community and societal change. Particular attention is given to the development of knowledge, values and skills related to practice and program evaluation, organizational development, consultation and personnel management including administrative supervision.

547. Professional Seminar. 2 credits. Co-requisite: SWk 588. The purpose of this seminar is to help the student integrate the theoretical knowledge they have acquired with through their practice experience and to explore the professional issues they have encountered in their educational experience.

566. Special Problems. 1-3 credits.

561. Fields of Practice. 2 credits. This course provides an overview in one of the specialized fields of practice approved by the Department of Social Work. Selected fields of practice are offered depending on student demand.

583. Field Instruction Seminar I. 1 credit. Prerequisite: Admission to program. Corequisites: SWk 586. This seminar course provides the nonadvanced standing MSW student with beginning opportunities to integrate theory and practice at the foundation level of advanced-generalist through discussion and written assignments.

584. Field Instruction Seminar II. 1 credit. Prerequisites: SWk 586 and SWk 583. Corequisites: SWk 587. This seminar course provides the student with opportunities to integrate theory and practice at the foundation level of advanced-generalist through discussion and written assignments.

585. Field Instruction Seminar III. 1 credit. Prerequisite: SWk 535 or SWk 536. Corequisites: SWk 588 and SWk 547. This seminar course provides the student in a field placement with opportunities to integrate theory and practice at the level of advanced-generalist through discussion and written assignments.

586. Field Instruction I. 4 credits. Prerequisite: admission to the program. Corequisite: SWk 583. This beginning practicum is a concurrent placement designed to enable the student to develop effective problem-solving skills in relation to individuals, groups, family, the community and/or the organizations which deliver social services. Students will be expected to demonstrate self-directed learning skills in addition to problem-solving interactions, interpersonal and personal awareness competencies. SU/Grading.

587. Field Instruction II. 4 credits. Prerequisites: SWk 586 and SWk 583. Corequisite: SWk 584. This course is a continuation of Field Instruction I. The emphasis is on developing a more effective use of self with a diverse population of clients and the further integration of practice for use. There is an emphasis on accurate analysis of the problem situation and the development and implementation of appropriate interventions with client systems. SU/Grading.

588. Field Instruction III. 4-9 credits (repeatably to a maximum of 9 credits).
Prerequisites: SWK 587, Field Instruction II; SWK 584, Field Instruction Seminar II.
Corequisites: SWK 547, Professional Seminar; SWK 585, Field Instruction Seminar III.
The advanced field practicum course is completed in a setting other than that utilized in Field Instruction I and II. The field practicum may require considerable absence from campus and the placement may require relocation. Students are expected to demonstrate advanced problem solving and interactive skills in an autonomous manner with increasingly complex situations. S/U grading.

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 Crawford, DiCristina, Driscoll, Huffman, Hume, Larson (Chair), Lutdtke, Meyer, Moen, Staples (Graduate Director), Stofferahn, Tiemann

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. Students in the pre-doctoral track typically declare cognates in sociology, theory and philosophy, or methodology and statistics. These cognates prepare them for admission to doctoral programs in sociology or to teach at a junior or community college.
4. Students in the sociological practice track typically declare cognates in planned intervention, public policy, organizational behavior, management, or criminal justice. These cognates prepare them for employment with federal or state agencies or private businesses.
5. Other cognates of a student’s own choosing may be approved by their faculty advisory committee.
6. Faculty will assist students in the sociological practice track in locating an internship to gain practical experience.
7. Under exceptional circumstances, where the spirit of residency is met, the Department may waive the residence requirements for an M.A. in Sociology. (See page 177 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

Space Studies

Professors Andres, Johnson, Seielstad

Program Description
The Department of Space Studies offers a program leading to a Master of Science degree. This interdisciplinary program is a study of the implications of humankind’s entry into space: the social, political, scientific, medical, commercial, and legal impacts, on a national and international level, that are associated with the evolutionary development of space. In addition, the biomedical and ecological effects of long-term, or continuous stay-times in a micro or low gravity environment are addressed, as will the new information and possibilities of global management afforded by remote sensing satellites looking back at Earth.

The program is designed to prepare the student for positions in both the commercial and governmental sectors of the rapidly growing field of space exploration, development, settlement, and communication.

Admission Requirements
1. A baccalaureate degree with a major in one of the following fields: Engineering, Science, Business, Social Science, Communication and Information Systems.
2. One course in statistics, calculus, or computer programming language (Computer Science 201, 260, 323, or equivalent) at the college level.
3. One course in sociology, psychology, or political science.
4. One course in science.

Degree Requirements
Thirty-two credits are required for a Master of Science degree.
Courses 501 (3 credits), 997 (2 credits), and two additional courses in the policy area, as well as two courses in the technical area, are required of all students. Beginning students should contact the department advisor for information about general course requirements. Students must choose a permanent advisor by the end of the second semester of enrollment, or three months before they expect to graduate, so that they may plan and formalize the remainder of their academic programs. Candidates must pass a comprehensive written exam to complete the program.

A minor in Space Studies consists of 9 hours including SpSt 501 (3), one additional lecture course (3), and 3 credit hours of other work with the approval of the Space Studies faculty.

Courses

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 students 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. 3 credits. A broad, multidisciplinary survey of our space program and its meaning for the future economic and national security of the nation. Emphasis will be placed on the multinational aspects of humanity’s move into this new milieu and what this means in terms of cooperation and competition for the United States. The course will include a survey of the major scientific and technical issues involved. SpSt 501 is a prerequisite/co-requisite to all other 500 level courses.

515. Human Factors in Space. 3 credits. A review of the major stresses experienced by humans on entering the new and alien environment of space. Examples will be taken from the psychological and physiological impacts experienced by U.S. and Soviet crews with emphasis on longer flights. How to avoid and/or overcome these stresses will be examined as an essential and growing need in the future development and settlement of the space frontier.

520. Asteroids, Meteorites and Comets. 3 credits. Prerequisites: SpSt 501 or permission of instructor. The small bodies of the solar system are clues to its origin. All planets and larger moons have been chemically transferred, but many asteroids, meteorites and comets are apparently little modified from the time of their origin 4.5 billion years ago. Each of these classes of objects is investigated separately, and relationships between them are examined.

525. Technical Issues in Space. 3 credits. An examination of the highly developed technological base required for the exploration and development of space. An understanding of this technology and of its impact upon humans is essential to an appreciation of many of the issues and problem areas that are and will be associated with our continuing efforts to explore and settle this new frontier. May be repeated if the topic is different.

535. Satellite Information Processing. 3 credits. The complex issues raised by the creation of new means of observing and managing our planet will be examined. Three billion bits of data per day are already being transmitted to Earth from satellites in space. This is anticipated to reach ten trillion bits in the next decade. Knowing what of these data to treat and how is already a critical issue for the successful management of our planet. The development of new earthbound institutions and autonomous, orbiting, intelligent systems is essential to the solution of this issue. Similarly, in-space data needs and use will grow exponentially once the space station and associated facilities are in operation.

541. Management of Space Enterprises. 3 credits. This course investigates the management of space organizations. These include organizations that are public and private, R&D and operations, profit and non-profit. You will learn the basics of management theory, the history of systems management, and the technical issues that must be considered in the management of space R&D and operations.

545. Space Policy and International Implications. 3 credits. Analysis of U.S. international space policy and the strengths and weaknesses it has demonstrated. Proposals for change and their implications are discussed. Space exploration and development is now a species rather than single-nation activity. What effect does, should, this have on the development of space policy and our overall relations with other nations and international organizations?

550. Aerospace Vehicles and Facilities Operations. 3 credits. A technically oriented examination of the management issues involved in the planning, design, development and operation of new and existing vehicles and facilities. The course will include a review of present vehicles and those that will be required in the next two decades, from expendable launchers to the aerospace plane.

551. History of the Space Age. 3 credits. This course introduces students to the history of human endeavors in space. These include the development of rocketry, the influence of amateur societies and science fiction, the military development of ballistic missiles, and human and robotic spacecraft.

555. Strategic Implications of Space. 3 credits. An analysis of the increasing strategic importance of space to the superpowers and other nations. The course deals with both the surveillance/reconnaissance mission and the introduction of offensive and defensive weapons into space.

565. Space Treaties and Legislation. 3 credits. A review of international treaties governing the uses of outer space as well as the domestic laws regulating commercial activities in space.

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. Corequisites: 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 1-KM AHI/R Project. Remote sensing litigation that has begun to address various applications of remote sensing will also be considered. Cases include Dow vs US and EOSAT vs NASA and NOAA.

590. Space Studies Seminar. 1 credit. A series of lectures presented by visiting lecturers and the faculty. May be repeated for up to 4 credits.

593. Individual Research in Space Studies. 1 to 3 credits. Individual student projects designed to develop advanced knowledge in a specific area of expertise. A written report is required. May be repeated for up to 6 credits.

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.


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. Commercialization of Space. 3 credits.

455. Soviet/Russian Space Program. 3 credits.

COURSE DESIGNATIONS

POLICY AREA COURSES: 440, 450, 541, 545, 551, 555, 565, 575.

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 directing, design and technical theatre, playwriting, dramatic literature, or history. Course work 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 course work 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 Introduction to Graduate Research 2 credits
   - Thea 501 Sem in Dramatic Literature 6 credits
   - Total 8 credits
2. Minimum of 6 credit hours in the production areas, i.e., Acting, Directing, and Design and Technical Theatre courses.
3. Minimum of 6 credit hours in the theory areas, i.e., Playwriting, Literature (except those listed in I above), Criticism, and History courses.
4. All students must take a written comprehensive examination before enrolling in Thea 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 course work completed by the student.

Courses

- **500. Introduction to Research in Theatre Arts.** 2 credits. Bibliography, research methods, 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, Oral Interpretation, Children’s Theatre, 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.
- **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.
- **336. Lighting for Stage II.** 2 credits.
- **339. Production Design.** 3 credits.
- **402. Acting III.** 3 credits.
- **404. Acting for the Music Theatre.** 3 credits.
- **415. Selected Problems in Theatre Arts.** 1 to 3 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.
- **427. Costume Design.** 3 credits.
- **480. Theatre Performance Studio.** 1 credit.
- **488. Playwriting.** 3 credits.

Visual Arts

(See Art, p. 190).
STATE BOARD OF HIGHER EDUCATION

The University of North Dakota is a part of the North Dakota University System consisting of ten publicly supported colleges and universities and one branch campus. The State Board of Higher Education is constitutionally responsible for the management of the University and is final authority in all matters affecting the University, exercising jurisdiction over its financial, educational, and other policies, and its relations with the state and federal governments. Certain administrative responsibilities of the Board have been delegated to the Chancellor of 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
BEVLAYBURGH, Grand Forks; term expires June 30, 2003
WILLIAM ISAACSON, Stanley; term expires June 30, 2002*
RICHARD KUNKEL, Devils Lake; term expires June 30, 2002
JOHN KORSMO, Fargo; term expires June 30, 2003*
CHUCK GROUPE, Hazen; term expires June 30, 2004
CRAIG CASPERS, Wahpeton; term expires June 30, 2005
RALPHKINGSBURY, Grand Forks; term expires June 30, 2005
STUDENTMEMBER, named annually to one-year term
NON-VOTINGMEMBER, named annually to one-year term
CHANCELLOR, LARRY A. ISAIK, Bismarck

*Terms were changed from seven to four years by the North Dakota State Legislature in 1997, effective with the appointee in 1997.

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ALICE BREKE, M.Acc., Assistant to the President and Director, Budget
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GERALD H. GRUENWOLD, Ph.D., Director, Energy and Environmental Research Center
PHIL HARMONDSON, J.D., Senior Associate to the President
SALLY PAGE, M.B.A., Affirmative Action Officer
TIMOTHY KERRICK, B.S.R.A., Internal Auditor
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DAVID VORLAND, M.S., Director, Office of University Relations
JOHNELLETTING, Ph.D., Vice President for Academic Affairs and Provost

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ELIZABETH G. NICHOLS, Ph.D., Dean, College of Nursing
TOBEANNOUNCED, Dean, School of Engineering and Mines
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Other administrators reporting to the Provost:
JEANNE ANDEREGG, M.L.S., Coordinator, Honors Program
MICHAEL RUBLEMM, M.S., Colonels, Professor, Military Science
SALLY ECKERT-TIOTTA, Ph.D., Interim Director, Office of Research and Program Development
DOROTHEE KERIAN, M.S., Director, Computer Center
NANCY KROGH, Ed.D., Registrar of the University
ELIZABETH RANKIN, Ph.D., Director, University Writing Program; and Director, Office of Instructional Development
KATHY SMART, Ed.D., Director, Center for Instructional & Learning Technologies
BARRY STINSON, M.A., Director, International Programs
WILBUR STOLT, M.L.S., Director, Libraries
H. DAVID WILSON, M.D., Dean, School of Medicine & Health Sciences
STEFFEN P. CHRISTENSEN, M.D., Assistant Dean for Students, Southeast Medical Campus, Fargo

EUGENE L. DeLORME, J.D.S., Director, Indians Into Medicine (INMED) Program
JUDY L. DE MERS, M.Ed., Associate Dean, Student Affairs & Admissions
MANUCHAR EBAD, Ph.D., Associate Dean for Research and Program Development
RANDY S. EKEN, B.A., Associate Dean, Administration & Finance
PAMELA D. KNUDSON, B.A., Director, Public Affairs
KAP J. LEE, D.V.M., Director, Biomedical Research Facility
ERIC LUNN, M.D., Assistant Dean & Director, Health Education, Northeast Medical Campus, Grand Forks
NICHOLAS NEUMANN, M.D., Assistant Dean & Director, Health Education, Southeast Medical Campus, Bismarck
WILLIAM P. NEWMAN, M.D., Assistant Dean for Veterans Affairs
LILA A. PEDERSEN, M.A.L.S., Director, Bentley French Library of the Health Sciences
BRUCE G. PITTS, M.D., Associate Dean & Director of Health Education, Southeast Medical Campus, Fargo and Director, Graduate Medical Education
MARTIN L. ROTHBERG, M.D., Assistant Dean & Director, Health Education, Northeast Medical Campus, Minot
ROBERT F. RUBEC, Ph.D., Associate Dean, Academic Affairs & Information Resources
DAVID THEISE, M.D., Assistant Dean for Clinical Education
RICHARD C. VARI, Ph.D., Assistant Dean for Science in Medicine Education
H. DAVID WILSON, M.D., Interim Director, Rural Health

ROBERT C. GALLAGHER, M.B.A., C.P.A., Vice President for Finance & Operations
PATHANSON, B.S.B.A., Director, Payroll & Risk Management
PAMHERBOLBRINKE, B.S., Controller
GREGKRAUSE, M.S., Director, Radiation and Chemical Safety
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JAMES UHLIR, Director, Auxiliary Services
JASON UHLIR, M.S., Director, Safety and Environmental Health
LARRY ZITZOW, Director, Facilities

ROBERT BOYD, Ed.D., Vice President for Student and Outreach Services
LILLIAN ELSINGA, M.A., Associate Vice President for Student Services and Dean of Students
JAMESHAFFER, Ph.D., Associate Vice President for Outreach Services and Dean of Outreach Programs
VACANT, Associate Vice President for Enrollment Management
ALANAGUERY, M.A., Director of Student Health Services
KAREN BERHOLD, Ed.D., Assistant Dean, Outreach Programs
DAWN BOTSFORD, M.S., Special Projects Coordinator, Vice President for Student and Outreach Services Office
BARRY BRODE, M.S., Director, Television Center and Northern Lights Public Radio
JERRY BULUSCO, M.A., Director, Judicial Affairs and Crisis Programs
LISA BURGER, B.A., Director, Student Academic Services
M. C. DIOP, M.Ed., Director, Multicultural Student Services
ODELLA FUKU, B.A.C., CPA, Director, Financial Management, Outreach Services
DEBGLENNEN, M.Ed., Director, Disability Support Services
ALICE HOFFER, M.S.Ed, Director, Student Financial Aid
LEIGH JEANOTTE, Ed.D, Director, Native American Programs
HEIDI KIPPEHAN, B.S.Ed., Director, Admissions
SHERI KORYNTA, Administrative Secretary, Vice President for Student and Outreach Services Office
MARY ANNE LUSTGRAF, M.Ed., Director, Memorial Union
MARISHA FARMAN, Ph.D., Director, Counseling Center
KAYMENDICK, Director, Women’s Center
JILL NOVOTNY, B.S., Administrative Officer, Vice President for Student and Outreach Services Office
KENTONPAULS, B.B.A., Director, Enrollment Services Office
NEILREUTER, M.S., Specialist in Counseling and Student Personnel, Director, TRIO Programs
MARK THOMPSON, M.S., Director, Career Services
FRED WITTMAN, M.S., Director of Project Development/Assistant to the Vice President
VACANT, Director, University Learning Services

*associate graduate faculty status
**full graduate faculty status
***adjunct graduate faculty status
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.

A
ABBOTT, DAVID W., Assistant Professor of Neuroscience; M.D., Tulane University of Washington
* ABRAMALLI, ALL Assistant Professor of Civil Engineering; Ph.D., University of Oklahoma
**ABRAHAMSON, HARMON B., Professor and Chairperson of Chemistry; Ph.D., Massachusetts Institute of Technology
**AHLER, JANET, Professor of Educational Foundations and Research; Ph.D., University of Missouri
AHMAD, IQBAL, Adjunct Assistant Professor of Pharmacology, Physiology and Therapeutics; Ph.D., Kent State University
**ALLEN, KRISTIN E., Captain, United States Army and Assistant Professor of Military Science; B.S., United States Military Academy West Point
ALLEN, JON W., Assistant Professor of Internal Medicine; M.D., University of North Dakota
ALEVA, PATTI A., Professor of Law; J.D., Hofstra University School of Law
**AMES, FORREST E., Associate Professor of Mechanical Engineering; Ph.D., Stanford University
**AMUNDSON, MARY, Assistant Professor of Community Medicine and Rural Health; M.A., University of North Dakota
**ANDREIEG, MICHAEL A., Chester Fritz Distinguished Professor of English; Ph.D., Yale University
**ANDERSON, CHRISTOPHER, Assistant Professor of Music; Ph.D., Duke University
ANDERSON, CINDY, Clinical Associate Professor of Nursing; M.S., University of Minnesota
**ANDERSON, SVEN, Assistant Professor of Computer Science; Ph.D., Indiana University
**ANDRES, ROBERT, Associate Professor of Space Studies; Ph.D., Michigan Tech University
**ANTES, JAMES R., Professor of Psychology; Ph.D., Iowa State University
ANTONENKO, DAVID R., Professor and Chairperson of Surgery; Ph.D., M.D., University of Alberta
ASKIM, MARY KAY, Assistant Professor of Marketing; Ph.D., Purdue University
**ATKINSON, MICHAEL, Associate Professor of Anatomy and Cell Biology; Ph.D., University of Minnesota
**AUSTIN, CHRISTOPHER, Assistant Professor of Biology; Ph.D., University of Texas at Austin

B
BABIUK, GARY, Assistant Professor of Teaching and Learning; Ph.D., University of Toronto
BACKSTROM, JOHN, Assistant Professor of Aviation; M.B.A., Wayne State University
* BAGHERI, FATHOLLAH, Associate Professor of Economics; Ph.D., University of Pennsylvania
* BAILLEY, TAMMY L., Assistant Professor of Social Work; Ph.D., Southern Illinois University at Carbondale
BARID, JOHN R., Associate Program Director of Fargo Family Practice Center and Associate Professor of Family Medicine; M.D., Washington University, St. Louis
BAKKEN, JEROME, Assistant Professor of German-Languages; Ph.D., Marquette University-Milwaukee
* BALLINTINE, THOMAS A., Associate Professor of Chemistry; Ph.D., Southern Illinois University
** BANDYOPADHYAY, BISWANATH, Professor of Mechanical Engineering; Ph.D., People's Friendship University, Moscow
BARRENTINE, CARL, Associate Professor of Humanities; D.A., Idaho State University
** BARRENTINE, SHELBY, Associate Professor of Teaching and Learning; Ed.D., University of California-Los Angeles
**BASS, GERALD, Professor of Educational Leadership; Ed.D., University of North Dakota
BASS, GAIL S., Instructor of Occupational Therapy; M.S., University of North Dakota
**BATEMAN, CONNIE RAE, Assistant Professor of Marketing; D.B.A., University of North Dakota
BEAL, JAMES R., Assistant Professor of Family Medicine; Ph.D., University of North Dakota
**BEARD, MICHAEL, Chester Fritz Distinguished Professor of English; Ph.D., Indiana University
**BEARD, VICTORIA, Associate Professor of Accounting and Business Law; Ph.D., University of North Dakota
**BEAVER, FRANK, P.E., Assistant Professor of Geology and Geological Engineering; Ph.D., University of North Dakota
**BENGAMIN, NAGY, Professor and Chairperson of Electrical Engineering; Ph.D., University of Calgary
BENNETT, BRIAN, Assistant Professor of Chemistry; Ph.D., University of Utah
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
BENSON, SANDRA, Clinical Associate Professor of Nursing; M.S., University of Minnesota
BERG, CAROL, Assistant Professor of Nursing; M.S., University of Arizona
BERG, FRANCES M., Adjunct Professor of Community Medicine; M.S., 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
**BEVELACQUA, ANTHONY, Assistant 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, Associate Professor of Economics; Ph.D., University of Kansas
BILLINGS, DAVID, Assistant Professor of Family Medicine; 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
BJERRE, MARILYN R., Clinical Associate Professor of Nursing; M.S., University of North Dakota
BLACKBURN, ROYCE, Assistant Professor of Music; M.M., University of Northern Texas
**BLACKWELL, J. LLOYD III, Professor of Economics; Ph.D., Georgia State University
**BLAKE, MICHAEL J., Associate Professor of Music; M.Ed., University of North Dakota
BLEHM, JULIE A., Clinical Associate Professor of Community Medicine and Rural Health; M.D., University of North Dakota
*BROCK, MARJORIE, Associate Professor of Teaching and Learning; Ed.D., University of Kansas
**BROPY, JEANETTE, Assistant Professor of Instructional Design and Technology; Ph.D., Indiana University
**BORG, KURT E., Research Assistant Professor of Pharmacology, Physiology and Therapeutics and Director, Academic Learning Center; Ph.D., North Carolina State University
**BORGERING, ANTHONY, Assistant Professor of Chemistry; Ph.D., Indiana University
BOUCHER, ALVIN O., Adjunct Assistant Professor of Family Medicine; J.D., University of New Mexico
* BROTHEN, SANDY, Assistant 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-Chicago
**BRADLEY, DAVID S., Assistant Professor of Microbiology and Immunology; Ph.D., University of South Dakota School of Medicine
BRIDEWELL, JOHN, Associate Professor of Aviation, MDIV, Southwestern Baptist Theological Seminary
**BRINKERT, RONALD, Associate Professor and Chairperson of Physical Education and Exercise Science; Ph.D., University of Oregon
BROSSEAU, JAMES D., Associate Professor and Chairperson of Community Medicine and Rural Health and Clinical Associate Professor of Internal Medicine; M.D., University of Minnesota
BROWN, ANN, Assistant Professor of Pathology; M.D., University of North Dakota
**FERRARO, F. RICHARD,** Professor of Psychology; Ph.D., University of Kansas

**FINK, KIM W.,** Assistant Professor of Art; M.F.A., Temple University

**FIORDO, RICHARD,** Professor, School of Communication; Ph.D., University of Illinois–Urbana

**FIRE, KEVIN M.,** Associate Professor of Communication Sciences and Disorders; Ph.D., Ohio State University

**FIVIZZANI, ALBERT J., JR.,** Chester Fritz Distinguished Professor of Biology; Ph.D., Louisiana State University

**FLESHMAN, SHERRIE,** Assistant Professor of Languages–French; Ph.D., University of Oregon

**FLOM-MELAND, CYNTHIA,** Instructor of Physical Therapy; M.P.T., University of North Dakota

**FLOWER, ANN M.,** Assistant Professor of Microbiology and Immunology; Ph.D., University of Colorado Health Sciences Center

**FLYNN, DAVID T.,** Assistant Professor of Economics; Ph.D., Indiana University

**FORSMAN, NELS F.,** Assistant Professor of Geology and Geological Engineering; Ph.D., University of North Dakota

**FOSTER, JAMES D.,** Research Assistant Professor of Biochemistry and Molecular Biology; Ph.D., University of North Dakota

**FOX, LAVONNE,** Instructor of Occupational Therapy; B.S.O.T., University of North Dakota

**FRAPPEL, JOHN,** Adjunct Instructor of Physical Therapy; M.S., University of Kansas

**FRY, JAMES H.,** Professor of Music; Ph.D., Eastman School of Music, University of Rochester

**FUNDINGSLAND, PAUL E.,** Professor of Art; M.F.A., University of Washington

**GAFFEE, MICHAEL,** Professor of Space Studies; Ph.D., Massachusetts Institute of Technology

**GAIGNON, GREGORY,** Associate Professor of Indian Studies; Ph.D., University of Maryland

**GAINES-STONER, KELLY,** Clinical Instructor of Law; J.D., University of Maryland

**GALLO, SERGIO,** Assistant Professor of Music; D.M.A., University of California–Santa Barbara

**GANE, LUCY A.,** Associate Professor of Communication; M.F.A., Academy of Art College–San Francisco

**GERBER, ANNE,** Assistant Professor of Biology; Ph.D., Washington University

**GERLA, PHILIP,** Associate Professor of Geology and Geological Engineering; Ph.D., University of Arizona

**GERSHMAN, KATHLEEN,** Professor of Teaching and Learning and Educational Foundations and Research; Ed.D., Harvard University

**GHSASEMI, AHMAD,** Assistant Professor of Geology and Geological Engineering; Ph.D., University of Oklahoma

**GIBRENS, BRAD,** Assistant Professor of Community Medicine and Rural Health and Associate Director, Center for Rural Health; M.P.A., University of North Dakota

**GILJE, FREDRICKA,** Associate Professor of Statewide Psychiatric Nursing Education Program at Jamestown, College of Nursing; Ph.D., University of Colorado

**GILLETTE, GREG,** Professor of Theatre Arts; M.F.A., Brandeis University

**GILSDORF, THOMAS,** Professor of Mathematics; Ph.D., Washington State University

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### Grand Forks, North Dakota

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INFORMATION SOURCES
about the
University of North Dakota
Grand Forks, North Dakota

Freshman Student Applications and Undergraduate Transfer Student Applications
Write: Enrollment Services, P.O. Box 8135
Grand Forks, ND 58202-8135
ONLINE: www.rdb.und.nodak.edu/www_plsql/ea_home
Telephone: (701) 777-4463
(800) CALL UND, ext. 4463
(701) 777-3367 TTY Service Only

Graduate Student Applications
Write: Graduate School, P.O. Box 8178
Grand Forks, ND 58202-8178
ONLINE: www.und.edu/dept/grad/admissns.html
Telephone: (701) 777-2945
(800) CALL UND, ext. 2945
(701) 777-2947 TTY Service Only

Visit and Tour Arrangements
Write: Enrollment Services, P.O. Box 8135
Grand Forks, ND 58202-8135
Telephone: (701) 777-4463
(800) CALL-UND, ext. 4463
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