North Dakota State University is in an exciting time of transformation, emerging as a model of the contemporary land-grant institution. By emphasizing quality education, outstanding service, and leading-edge research, NDSU is a leader among its peers.

At this university, students are prepared for both life and career through exceptional classroom studies, research opportunities, cultural activities, and social events. Our students work hard, but the challenges of an education at NDSU reap many rewards.

The campus is clearly an institution of choice. NDSU’s enrollment is more than 13,000 students in our undergraduate and graduate programs. Our annual research expenditures surpass $100 million. NDSU’s new doctoral and master’s degree programs have given us the graduate program mix of a national land-grant university, and our graduate enrollment now surpasses 1,700 students. Bison student athletes successfully compete in the ranks of NCAA Division I.

Our visitors marvel at the sense of enthusiasm that they see on the NDSU campus. It’s clear to me that people from around the country are looking at our state and our university in a different and very positive way.

NDSU’s mission statement says much about who we are. It reads: “With energy and momentum, North Dakota State University addresses the needs and aspirations of people in a changing world by building on our land-grant foundation.”

I urge you to use this catalog – join us as the university moves to the next level. I believe that many more successes await us.

Joseph A. Chapman
President

Disclaimer
The State Board of Higher Education requires that the following announcement be published in all catalogs and bulletins of information issued by the state educational institutions of North Dakota: “Catalogs and bulletins of educational institutions are usually prepared by faculty committees or administrative officers for the purpose of furnishing prospective students and other interested persons with information about the institutions that issue the same. Announcements contained in such printed materials are subject to change without notice, and may not be regarded in the nature of binding obligations on the institutions and the State. In times of changing conditions, it is especially necessary to have this definitely understood.”

Reservation of Rights
Every effort has been made to provide accurate and current information; however, the right is reserved to change any of the rules and regulations of the university at any time, including those relating to admission, instruction, and graduation. The right to withdraw curricula and specific courses, change or discontinue programs, alter course content, change the calendar, and to impose or increase fees similarly is reserved. In some cases, requirements for programs and prerequisites for courses offered are effective even if they are not listed in this bulletin. All such changes are effective at such times as the proper authorities determine, and may apply not only to prospective students but also to those who already are enrolled in the university.

Contents
NDSU Overview
  2 Mission and Vision
  2 Campus Themes
  2 NDsu in Perspective
  2 NDsu Today
  3 Accreditation
  3 Divisions
University Services and Outreach
  3 Experiment Station and Extension
  3 Facilities Management
  3 Information Technology Services
  4 NDsu Libraries
  4 Institutional Research and Analysis
  4 Statistical Consulting Service
  4 NDsu Research and Technology Park
  4 Alumni Association
  4 Centers and Institutes
Rights and Responsibilities
  7 Policies, Rights and Responsibilities
Enrollment Information
  8 Admission Policies
  8 Campus Visits
  9 Freshman
  9 Transfer Students
  9 Early-Entry Students
  9 Non-Degree Students
  9 Admission by Exam (GED)
  9 International Students
  10 Graduate Students
  10 Returning Students
  10 Selective and Limited Admission Programs
Student Financial Information and Services
  11 Tuition and Fees
  11 Program Fees
  11 Room and Board Rates
  11 Tuition Costs
  12 Refunds
  12 Residency and Tuition Reciprocity
  13 Financial Aid
Student Programs and Services
  13 Career Center
  14 Counseling - Disability Services
  14 Dining Services
  14 Disability Services
  14 Residence Life
  14 Memorial Union
  15 Student Activities
  15 Athletics
  15 NDsu Bookstore
  16 Wallman Wellness Center
Special Instructional and Support Opportunities
  16 Center for Writers
  16 Collaborative Student Registration
  16 Distance and Continuing Education
  17 International Program Services
  17 Study Abroad
  17 Multicultural Student Services
  17 Native American Pharmacy Program
  17 Orientation and Student Success
  17 Project 65
  17 ROTC
  18 Summer Session
  18 Tri-College University
  19 TRIO Programs
  19 University Honors (Scholars) Program

Academic Information and Regulations
  19 Undergraduate Areas of Study
  21 Majors and Degrees Available
  22 General Education Program
  24 Degree Requirements
  25 Graduation Requirements
  25 Evaluation of Transfer Credits
  26 Credit by Exam
  28 Academic Planning and Registration
  28 Registration
  29 Classification of Students
  29 Eligibility for Co-Curricular Activities
  29 Student Credit Load
  29 Student Records, Grades
  31 Scholastic Standards

The Colleges
  32 Agriculture, Food Systems, and Natural Resources
  43 Arts, Humanities and Social Sciences
  59 Business
  63 Engineering and Architecture
  75 Human Development and Education
  86 Pharmacy, Nursing, and Allied Sciences
  91 Science and Mathematics
  103 University Studies
  104 Interdisciplinary Programs
  108 Graduate School

Course Descriptions
  111 Course Descriptions (listed alphabetically by units providing coursework)

Administration and Faculty
  184 Administration
  184 Faculty

References
  Outside back cover, Academic Calendar
  200 Index
  204 Campus Map

University Telephone Numbers
Area Code 701
Admission
  231-8643
  www.ndsu.edu/prospective_students

Bison Connection
  231-6200
  www.ndsu.edu/bisonconnection

Counseling Center
  231-7671
  www.ndsu.edu/counseling

Customer Account Services
  231-7320
  www.ndsu.edu/bsiconnection/cas

Disability Services
  231-8463
  www.ndsu.edu/counseling/disability.shtml

Graduate School
  231-7033
  www.ndsu.edu/gradschool

International Programs
  231-7895
  www.ndsu.edu/InternationalIntlSt/ism.shtml

Multicultural Student Services
  231-1029
  www.ndsu.edu/multicultural

Orientation and Student Success
  231-8379
  http://oss.ndsu.edu

Provost and Academic Affairs
  231-7131
  www.ndsu.edu/vpaa

Registration and Records
  231-7981
  www.ndsu.edu/registrar

Residence Life
  231-7557
  www.ndsu.edu/reslife

Student Affairs
  231-7701
  www.ndsu.edu/vpaa

Student Financial Services
  231-7533
  www.ndsu.edu/bsiconnection/sfs

University Switchboard
  231-8011

Information in this bulletin will be made available in alternate formats upon request. Please place your request by calling 701-231-7198.
OVERVIEW

Mission
With energy and momentum, North Dakota State University addresses the needs and aspirations of people in a changing world by building on our land-grant foundation.

Vision
- We envision a vibrant university that will be globally identified as a contemporary metropolitan land-grant institution.

Core Values
NDSU is guided by the following key values and principles:

Land-grant
- We reflect and serve geographically and culturally diverse populations.
- We share institutional success across the university.
- We anticipate and welcome growth and service that will occur in ways yet to be conceived.
- We embrace our unique complexities as a land-grant university on the Northern Great Plains.
- We remain committed to serving people globally.

People
- We derive strength and vitality from each other and from the diverse communities we serve.
- We care about the current and future welfare of our students, staff, and faculty.
- We promote excellence through individuals participating in decisions and value cooperation for the common good.

Scholarship
- We are an engaged university and acknowledge and pursue scholarship of all forms, including discovery, teaching, integration, and application.
- We uphold the rights and responsibilities of academic freedom.

Teaching and Learning
- We provide a superior teaching and learning environment within and outside of the traditional classroom.
- We promote and value liberal, graduate, and professional education in a collegial environment where divergent ideas can be shared.
- We foster an environment that promotes life-long learning with individually-defined goals.

Ethics
- We maintain our integrity through principled action and ethical decision-making.

Culture
- We will be the land-grant university that we want to be by welcoming and respecting differences in people and ideas.
- We support the goals of the North Dakota University System and value collaboration with colleges and universities around the world.
- We foster accessibility to our programs and services.

Accountability
- We have a special relationship with, and are accountable to, the people of North Dakota.
- We actively strive to contribute to our region’s economic prosperity and to improve the quality of life.

Campus Themes
It’s About People
North Dakota State University exists as a human endeavor; a means to accomplish a greater good. It’s About People, acknowledges the service we do for our fellow citizens, but also emphasizes the institutional commitment to the people of NDSU and our desire to reward those whose efforts are serving the public’s interests.

Students are Paramount
In recent years, NDSU has seen tremendous growth in the size of our student body from some 9,700 students in 1999 to our goal of more than 12,500 students in our graduate and undergraduate programs. NDSU’s growth is grounded in the strength of our existing programs and fueled by the strategic addition of new programs. Undergraduate education remains the foundation of our educational offerings while new graduate programs are retaining and keeping young people in the state. NDSU students are active partners in our institutional transformation.

Programs
In the past few years, we have successfully launched many new undergraduate and graduate programs. Total doctoral enrollment has risen from about 150 to more than 520 students. We have reinforced the integrity of NDSU’s academic offerings by emphasizing our faculty’s expertise in research and creative activities while maintaining our focus on teaching and learning.

Leveraging Support
NDSU’s growth is a major contributor to the state’s economy. A recent study showed that during the past eight years, NDSU’s budget growth alone has had a $1.9 billion economic impact. For 2007, the growth supported an additional 3,100 jobs and generated $116.7 million in retail sales, $5.4 million in additional sales and use tax collections, and $2.3 million in additional personal income tax collections. According to the research, for every additional dollar of state support NDSU has received, the university has generated roughly $7.50 of other funds.

Stature
NDSU is experiencing a period of remarkable success. Few universities have experienced our growth in enrollment, research expenditures, program expansion, or growth in campus infrastructure in such a short time. Our faculty, staff and students have seized upon an opportunity to be more and have catapulted this university forward. NDSU’s institutional stature also has increased through a highly successful transition in intercollegiate athletics to NCAA Division I. We are increasing awareness of our state and representing North Dakota with pride and competitive excellence.

NDSU in Perspective
A Bit of History
North Dakota had been a state less than a year when Gov. John Miller signed a bill on March 8, 1890, designating a square mile of land adjoining Fargo as the site of the new campus and demonstration farm under the name North Dakota Agricultural College and Agricultural Experiment Station.

With President Horace E. Stockbridge and five faculty members, the university opened for its first collegiate year on Sept. 8, 1891. A total of 30 students were listed in the 1891 Prospectus as being “matriculated in the Special Course.”

Through its proud history, the campus has gained a strong reputation for quality in education, research and service. An engaged university and a leader among its peers, NDSU is emerging as a model of the contemporary metropolitan land-grant university.

The Land-Grant Heritage
Honoring the commitment of the Morrill Act of 1862, the land-grant universities were established to provide studies that were a blend of technical and academic subjects. Known as a “people’s college,” NDSU was part of the bold experiment to provide access to a college education for the common person.

NDSU, the state’s first land-grant institution, is well positioned to prepare graduates for the global marketplace and technologically oriented economy. Through a statewide network of centers and electronic technology, NDSU provides a growing capability for delivering education, cultural activities and information to schools and homes throughout North Dakota. NDSU is a publicly supported comprehensive land-grant institution, with a strong agriculture and applied science tradition.

NDSU Today
NDSU is clearly an institution of choice. Having experienced a remarkable period of growth and with the development of expanded academic opportunities, NDSU is a national model of the contemporary land-grant institution.

A university with more than 12,500 students in its undergraduate and graduate programs, NDSU’s research expenditures surpass $100 million annually.

The Carnegie Foundation for the Advancement of Teaching classifies NDSU among “Research Universities (high research activity)” in its new “basic” classifications of United States colleges and universities. NDSU is in the same Carnegie category as institutions such as Boston College, Brigham Young University, Clemson University, Marquette University, Temple University, and the University of Oregon.

NDSU continues to advance in all areas because of the energy and dedication of faculty, staff, students, alumni, and friends.

Accreditation
NDSU is accredited as an institution by the North Central Association of Colleges and Schools. Inquiries may be directed to the Higher Learning Commission of the North
Central Association of Colleges and Schools, 30 North LaSalle St., suite 2400, Chicago, IL 60602-2504. In addition, many programs are accredited or approved by their respective professional organizations and agencies. Program accreditation or approval is listed in the college sections of this bulletin.

The Faculty
NDSU has more than 650 resident faculty members. Because of the nature of a land-grant university, many faculty hold joint appointments with affiliated research organizations on the campus.

Divisions

Division of Academic Affairs (www.ndsu.edu/vpaa)
The Provost and Vice President for Academic Affairs’ responsibilities include academic resources and budget, professional faculty matters, and the university’s curriculum of instruction. Further responsibilities include eight colleges, graduate school, library, institutional programs, institutional research and analysis, accreditation and assessment, and the Great Plains Transportation Institute.

Division of Agriculture, Food Systems, and Natural Resources (www.ag.ndsu.nodak.edu/ag-yp/vp-page.htm)
NDSU Agriculture is an education, research, and outreach partnership consisting of the NDSU College of Agriculture, Food Systems, and Natural Resources; North Dakota Agricultural Experiment Station; NDSU Extension Service; NDSU Research Extension Centers; and the Northern Crops Institute. Its mission is to foster North Dakota communities as vital economic and social units through the formation of partnerships that educate the public in agriculture, life, and environmental disciplines; provide creative, cost-effective solutions to current problems; and pursue all relevant fundamental research.

Division of Finance and Administration (www.ndsu.edu/ndsu/spbf)
Finance and Administration strives to be a resourceful partner by providing direct and advisory services through its departments of financial services, facilities management, human resources/payroll, budgeting, purchasing, audit and advisory services, and university police and safety. The Finance and Administration Division is committed to excellence, and it demonstrates that through its innovative problem solving, cooperative relationships, and focus on customer service.

Division of Information Technology (http://pit.ndsu.edu)
Information Technology Services (ITS) provides leadership, planning, implementation, and support for a wide range of exemplary IT services, programs, and resources available to North Dakota State University, the North Dakota University System, and the state of North Dakota. ITS supports the land-grant ideal in an environment of collaboration, teamwork, and individual initiative.

Division of Research, Creative Activities and Technology Transfer (www.ndsu.edu/research)
The Division of Research, Creative Activities and Technology Transfer (RCATT) is dedicated to advancing NDSU research, creative activities, and technology transfer; fostering entrepreneurial projects; interacting with the N.D. Legislature, the Board of Higher Education, federal program officers and administrative personnel, and congressional delegations and their staffs; providing leadership for enhancing NDSU’s national status as a research and graduate institution; and establishing NDSU’s new Research and Technology Park.

Division of Student Affairs (www.ndsu.edu/vpsa)
The Division of Student Affairs at NDSU serves student needs by providing specialized services, educational programs, and offerings directed at academic and student personal growth. Division personnel encourage student involvement within the university and serve as advocates for student concerns. Division functions are provided in a spirit of support for the teaching, research, and public service of the university.

Division of University Relations (www.ndsu.edu/vpur)
The mission of University Relations is to build public understanding of and strong public and private support for NDSU and to continue to attract and retain outstanding students. The mission can be accomplished through activities designed to inform, educate, and persuade the citizens of North Dakota, the region, and the nation about the areas of excellence at NDSU. In addition, the program is intended to recognize the contributions of the citizens to the university.

The Campus
The NDSU campus includes 104 buildings on nearly 41 square blocks or 258 acres, and has expanded into downtown Fargo. With an infrastructure of 5.8 miles of streets, 16.7 miles of sidewalks, 59.4 acres of parking lots, 5.2 miles of steam lines, 8.6 miles of water lines, 4,800 miles of outside telephone/data conductor cable, 58 miles of cable TV, 13.1 miles of sewer lines, and 22.3 acres under irrigation, NDSU is a small city within itself. In all, NDSU is located on 22,053 acres of North Dakota land. This includes the main Agricultural Experiment Station in Fargo and eight research centers throughout the state.

Academic Programs
NDSU offers more than 100 undergraduate and approximately 100 graduate degree programs of study in nine academic colleges. Degrees are awarded at the doctoral, master’s, professional, and baccalaureate levels. Various undergraduate minors and certificate programs also are available. Programs offered at the time of this publication are listed in the Academic Information and Regulations section of this bulletin or may be viewed online at www.ndsu.edu/majors.

UNIVERSITY SERVICES AND OUTREACH

Experiment Station and Extension (www.ag.ndsu.edu)
In keeping with its historical strength in agricultural research, NDSU Extension Service offices are located across the state, and more than 18,000 acres are dedicated to agricultural research. In addition to the main North Dakota Agricultural Experiment Station at Fargo, facilities include:

- Agronomy Seed Farm, Casselton
- Carrington Research Extension Center
- Central Grasslands Research Extension Center, Streeter
- Dickinson Research Extension Center
- Hettinger Research Extension Center
- Langdon Research Extension Center
- North Central Research Extension Center, Minot
- Williston Research Extension Center

Facilities Management (http://facilities-mgmt.ndsu.nodak.edu)
Facilities Management provides many services to the NDSU academic community with its 150 person staff. The services include: building maintenance/construction, trash/recycling, custodial, grounds/landscape, utilities, motor pool, parking/transit, mail delivery/moving, and central stores. Most units within Facilities Management are located in the thorson maintenance center on bolley drive, 231-7911. Emergencies on weekends and evenings should be directed to 231-8998.

Information Technology Services (www.ndsu.edu/its)
Information Technology Services supports the educational, research and administrative functions of the university by proving a range of resources and support services for students, faculty and staff. ITS administrative offices are located in the Industrial Agriculture and Communications Center (IACC).

ITS provides about 30 computer clusters for student, faculty and staff use and for instructional purposes. Instrumented classrooms provide instructors with computers and multi-media services to support learning.

E-mail: NDSU e-mail accounts are an official communication channel for students. Students are expected to check their NDSU e-mail accounts frequently to ensure they do not miss messages regarding courses, financial aid, tuition, registration and other important issues. Students can set up and manage their NDSU e-mail account at http://enroll.nodak.edu.

The Technology Learning & Media Center: Students are on duty at the TLMC to assist with technology-related coursework and projects. Services include assistance with multimedia (video and audio capturing, and editing), plotting, graphics, and scanning. Self-paced learning resources are available in the TLMC and short courses on technology are offered.

Network and Internet Access: ITS provides wired access to offices and workspaces across campus. Wireless access offers a connection to the Internet from many public locations on campus. See the ITS Web site for information on security and access.
Help Desk: Students, faculty and staff needing help with e-mail accounts, network connectivity, and many other computing questions, can contact the ITS Help Desk. Telephone and e-mail support, as well as online resources, are available to students and faculty to help with computing needs. The Help Desk is located in IACC 150.

Training: Free technology training for NDSU students is funded by the Student Technology Fee. Most classes are short sessions and offer hands-on experience with a variety of software programs and other current technologies. Classes range from introductory to advanced. Courses also are available for faculty and staff.

Interactive Video: NDSU has several distance education technologies available for courses, meetings, and seminars. The North Dakota Interactive Video Network is a broadcast-quality, two-way audio and video system that can connect to more than 300 locations in North Dakota and to other compatible video systems worldwide. Additionally, ITS supports desktop video and audio applications for classroom, collaboration, and communication settings.

Blackboard: Blackboard is a powerful, easy to use, learning management system that enables communication between instructors and students. It allows instructors to provide students with course materials, as well as tools for class interaction, including discussion boards, virtual chat, calendaring, file exchange, on-line assessment, and grading. Students also can use Blackboard to access their Bison Card accounts and to add to their allocations for on-campus printing.

Research Support Services: ITS provides research support services such as statistical consulting for faculty, staff, and students; professional services in support of the Center for High-Performance Computing; and consultation with researchers on the IT components of their grant proposals.

EduTech: NDSU cooperates with the state Information Technology Department and the Educational Technology Council to operate EduTech, which provides information technology services and related professional development for K-12. EduTech's mission is to provide North Dakota educators and students with opportunities that extend learning in the classroom and beyond, focusing on the use of technology to improve student achievement.

NDSU Libraries (www.ndsu.edu/library)
The NDSU Libraries play an essential role in the educational and research activities of the university.

The collections include more than 650,000 bound volumes, 35,000 print and electronic full text current serials, 90,000 maps, and a variety of audiovisual materials. As a Regional U.S. Government Publications Depository, NDSU and the University of North Dakota share deposited publications from the U.S. Government. More than 400,000 U.S. government documents are available in the NDSU Libraries. Archival and manuscript records, historical publications, photographs, and other documents concerning North Dakota and NDSU are housed in the North Dakota Institute for Regional Studies and University Archives.

The Libraries offer conference rooms, study rooms, and three computer clusters. The Main Library is open 90.5 hours per week during the academic year; departmental libraries are open 65 hours per week. Hours for holidays, summer sessions, and break periods are posted throughout the Libraries and announced in campus publications. Call 231-9456 or check the library Web site for current information regarding hours.

The Libraries' holdings may be accessed via the online catalog. In addition to NDSU collections, the online catalog interfaces with other online catalogs of academic, public, and special libraries in North Dakota, South Dakota, and Minnesota.

NDSU is a member of the Tri-College University and shares library resources with Minnesota State University Moorhead and Concordia College. The daily shuttle service that operates among the Tri-College libraries, medical and public libraries in Fargo-Moorhead is supplemented by a daily shuttle with the UND Libraries. NDSU faculty, students, and staff library cards also are valid at the MSUM and Concordia Libraries. Interlibrary Loan Service provides access to the collections of libraries throughout the region, the nation, and the world.

NDSU Libraries offer a full range of library education services including general tours and orientations, course-related instruction in specific subject areas, demonstrations of special services and information formats, plus several credit courses.

Institutional Research and Analysis (www.ndsu.edu/oira)
The Office of Institutional Research and Analysis directs activities that empirically describe and evaluate the educational, administrative, and support functions of NDSU. OIRA provides standard reports to serve academic and administrative functions of internal and external entities.

Statistical Consulting Service (http://its.ndsu.edu/instruction_and_research/statistical_consulting)
Consulting assistance is provided for students, faculty, and staff with statistical aspects of research including planning a study, organizing and analyzing data, and communicating the results.

NDSU Research and Technology Park (www.ndsuresearchpark.com)
The NDSU Research & Technology Park (RTP) was created to provide university researchers and private industry with a central location to combine their talents to develop new technologies. The RTP and the newly opened Technology Incubator are home to fast-paced, high-growth companies that promote economic development in North Dakota. Companies in the RTP and Technology Incubator either have the potential to compete globally or are already doing so effectively. To operate with the RTP, a company must be involved in the advancement and development of new technology, be willing to establish a working relationship with NDSU and work in one or more of the following technology fields: Material Sciences, Nanotechnology, Biosciences and Life Science Technology, Advanced Manufacturing and Sensors/Micro-Electronics and Information Technology.

Alumni Association (www.ndsualumni.com)
The NDSU Alumni Association strives to engage more than 70,000 alumni with the university by providing communication, leadership, and programming. The Alumni Association is a private organization directed by a 30-member board of directors. Alumni are critical to the success of the institution by providing guidance, volunteer time and talent, and financial support.

Centers and Institutes (www.ndsu.edu/research/centers_institutes.php)
Applied Plant Breeding Institute: The Applied Plant Breeding Institute provides a single site for reliable, high-quality targeted research, education, and technology transfer in applied plant breeding.

Beef Systems Center of Excellence: The Beef Systems Center of Excellence provides “gate to plate” research, teaching, and outreach programs. The “gate to plate” concept directly links consumer research to product development in the area of beef and beef products. The Center of Excellence has three objectives:
1. Enhance NDSU’s ability to provide cutting edge meat science research;
2. Provide training, educational, and outreach opportunities in slaughter, beef processing, food safety; and further processing; and
3. Create a model for development of a coordinated beef processing industry which could be implemented in other parts of the state, region, or country.

Bio-Imaging and Sensing Center: A multidisciplinary center in the College of Agriculture, Food Systems, and Natural Resources, it is located in NDSU’s Department of Agricultural and Biosystems Engineering and the Industrial and Agricultural Communication Center. This center conducts fundamental and applied research in advanced sensor and information technologies such as computer imaging, sensing, and decision support methods for applications in the agricultural and food industries. This center was established in 2000.

Bio Imaging and Sensing Center

Bison Center of the Northern Plains: The center is a virtual organization with contributing scientists in several disciplines and departments. It serves as an information clearinghouse, drawing on research from NDSU as well as other institutions. Bison research at NDSU focuses on ruminant nutrition, meats, and disease issues with economics and marketing addressed as well. Center faculty maintains an active relationship with bison researchers in other states and Canadian provinces, especially with the Alberta Bison Centre of Excellence. The Center serves bison producers and anyone interested in the species from all over the North American Continent.

Cell Biology Center: The CBC is located in Hultz Hall and is a state-of-the-art facility for research in cell biology. Since its inception in 1989, it has provided research support to numerous faculty, postdoctoral fellows, and graduate and undergraduate students from NDSU and throughout the Midwestern states.

Center for 4-H Youth Development: 4-H Youth Development creates supportive learning environments for youth and adults to reach their fullest potential as capable, competent, and caring citizens. The center provides formal and non-formal community-focused experiential learning; develops skills that benefit youth throughout life; fosters leadership and volunteerism in youth and adults; builds internal and external youth/
adult partnerships for programming and funding; strengthens families and communities; and uses research-based knowledge and the land-grant university system.

Center for Advanced Electronics Design and Manufacturing (CAEDM): CAEDM matches NDSU’s unique technology expertise with businesses striving to achieve results in fast-paced global markets. The vision of North Dakota’s Governor and Legislature resulted in the Economic Development Centers of Excellence Program being established in 2005. CAEDM’s mission includes spurring economic development in electronics, manufacturing and related disciplines.

Center for Agricultural Policy and Trade Studies: The center was established in 1998 as the Northern Plains Policy and Trade Research Center to analyze a wide range of agricultural trade and policy issues affecting the economic well-being of the northern Plains. The name was changed in 2000 to incorporate issues related to agricultural policy and farm income. Economic research and outreach activities include (a) analyzing national agricultural policies, multilateral trade treaties, regional trade agreements, and cross-border trade issues for northern grown crops and processed products, and (b) developing strategies to improve export opportunities for northern grown crops and processed products. Outlooks for the North Dakota farm economy, the U.S. and world wheat industries, and the U.S. and world sugar industries are published annually.

Center for Child Development: Created in 1955, the center is accredited by the National Academy of Early Childhood Programs. The center is a laboratory school for NDSU students to observe, do research, and to participate in a high-quality program and developmentally appropriate environment for children ages 6 weeks to 6 years. Childcare and education are available full days during the academic year for students, faculty, staff, and the community. Contact the Center for more details.

Center for Community Planning and Design: The Center for Community Planning and Design undertakes “visioning” projects for non-profit organizations and small communities who would otherwise not have access to professional design services. Landscape architecture and architecture students, under faculty guidance, gain practical experience by working on actual design issues while assisting clients to envision a future enhanced by the contributions of architecture and landscape architecture. Since this work is undertaken by students, working drawings or other plans from which a client could build are not provided. It is expected that clients take the student work to their own funding sources for the purpose of securing funds to retain a professional architect or landscape architect who will design and build the actual project.

Center for Community Vitality: Part of the NDSU Extension Service, the mission of the Center for Community Vitality is to help create vital North Dakota communities. Goals include: 1) To help individuals gain their desired standard of living and quality of life; and 2) To help North Dakota communities to be strategically ready to take advantage of opportunities.

Center for Heritage Renewal: The center was established in 2006 as part of the North Dakota Institute for Regional Studies. Its purpose is to conduct research in the area of historic preservation in the broadest sense of collecting and analyzing oral and written records, architectural features, and other tangible evidence of the heritage of Plains and Prairies Peoples.

Center for High Performance Computing (CHPC): Located in the NDSU Research & Technology Park, CHPC was established as a Center of Excellence by the N.D. State Board of Higher Education in June 2003. The objectives of the center are (1) to meet the high performance computing needs of the NDSU research community and its public/private sector partners, and (2) to provide the user community with strategic information-based services such as data to serve as an anchor tenant in North Dakota’s research corridor. The CHPC platforms include clustered computers from Silicon Graphics, Inc. and D&K Tech, a Fargo-based computer company, and utilize the Linux operating system and other open-source development tools.

Center for Nanoscale Science and Engineering (CNSE): CNSE is engaged in interdisciplinary research at the micro and nanoscale levels of science and engineering. Working with partners in government and the private sector, our goal is to develop practical materials, processes, and devices with potential for world impact. CNSE began in August 2001 with a Department of Defense contract to establish a Center for Excellence for micro and nanosensor systems, and to begin research on low-power, miniature battlefield sensors.

Center for Natural Resource and Agroecosystem Studies: The center was approved in 2008 as part of the School of Natural Resource Sciences. The mission of the center is to provide an avenue for collaborative research and products focused on the sustainability of regional natural resources, and to provide a link between researchers and land managers on practical application of sustainable agricultural practices. Regional scientists from universities, and state and federal governments, as well as private and public land managers may utilize the Center to study complex natural resource issues requiring a diverse expertise base to solve.

Center for Nutrition and Pregnancy (CNP): CNP was formally approved by the N.D. State Board of Higher Education in December 2002. The mission of the center is to provide coordinated research activities focused on the impact of nutrition during pregnancy on health of the mother, fetus, and offspring. Research during the last 60 years has demonstrated that maternal nutrition has a dramatic impact on birth weights and long-term health and productivity in humans and animals. The current investigators comprise an established team of nutritionists and physiologists who are internationally recognized for their work in this area. In addition, these scientists are located in outstanding research departments and institutions. For example, the Rowett Research Institute, in Aberdeen, Scotland, is one of the premiere human and animal nutrition research institutes in the world and boasts three Nobel laureates.

Center for Protease Research (CPR): Funded by a five-year, $8.25 million grant from the National Institutes of Health - National Center for Research Resources, CPR is a multidisciplinary research center coordinating the expertise of faculty from the departments of chemistry and pharmaceutical sciences. The center’s aim is to help combat diseases including arthritis, diabetes, and cancer. Research focuses on a class of enzymes called matrix metalloproteinases (MMPs), which play vital roles in biological functions. Too much or too little MMP activity may contribute to diseases.

Center for Science and Mathematics Education: The center was established in 1998 to develop and administer collaborative K-16 educational projects in science, mathematics, engineering, and technology. The center coordinates competitive events such as the N.D. Science Olympiad and the Science Fair. The center facilitates the NSF-funded GK-12 (GraUS) and N.D. Master Science Teaches (MSTeP) programs. Several research grants centered on science, mathematics, and engineering education are administered by the center, including those of the World Wide Web Instructional Committee (WWWC).

Center for Social Research: Established in 1976, the center facilitates such social-sciences research as conducting focus group studies and computerized telephone and mail surveys.

Center for Visual Neurosciences: The National Institutes of Health awarded NDSU researchers a five-year $8.9 million grant in 2004 to establish a Center for Biomedical Research Excellence (COBRE) for visual neuroscience at the university. Within the center, NDSU researchers examine various aspects of the neural mechanisms and functional significance of visual perception, visual attention, visual cognition, and action.

Center for Writers: The center provides free writing assistance to students, faculty, and staff in all departments and at all levels. Writing consultants work with writers during prewriting, writing, and rewriting stages of their work. The consultants also work to further writing across the curriculum and writing in the disciplines by working with instructors at all levels and in all disciplines to develop effective writing assignments and effective response strategies to writing.

Center for Rural Studies: Established in 2000, this joint center with the University of North Dakota, works to enhance the quality of life of rural residents of the Northern Plains through coordinated research and information dissemination efforts.

Center of Excellence for Surface Protection: NDSU’s Center of Excellence for Surface Protection provides access to world-class coatings and corrosion research expertise, building upon NDSU’s more than 100 years of research in these areas. The center does the following: creates, develops, and tests organic and inorganic soft and hard coatings and application methods; performs studies in corrosion control and corrosion detection; conducts specialty tests, measurements, and analysis for research partners and collaborators to assist them in meeting their needs; performs accelerated exposure tests; and provides technical consulting services for research partners and collaborators. The Center for Surface Protection is funded through a variety of federal, state, and private sources. Part of the center’s mission includes stimulating economic development through market-driven research for private sector partners and collaborators.

Computer Systems Institute: Created in 1983, the institute promotes and supports multi-disciplinary research and development activities in computer systems, and especially in computer systems with applicability to commerce, farming, and industry in North Dakota. Computer systems are complex aggregates of digital computer hardware and software, designed to carry out specific tasks or purposes. The institute serves as an organizational structure to seek research support, equipment, and projects aimed at the growth of computer systems design expertise in North Dakota. This includes the development of expertise at NDSU and nearby universities as well as collaboration with industry in research and development that promotes computer systems design expertise in the state.
Emily P. Reynolds Historic Costume Collection: The collection is a repository of material culture focusing on clothing, textiles, and related items. Items from all over North Dakota, the surrounding regions and the world are included in the collection, but the collection concentrates on items worn or used in North Dakota. The collection is available to researchers and to the general public by request.

Engineering Research Center (The Engineering and Architecture Experiment Station and Extension Service): Special research activities and projects of the college are coordinated through the Experiment Station. The professional services of faculty and the facilities of the college are available to both private and governmental agencies for research and development studies on engineering or architectural problems. Research projects of individual faculty members are sponsored and promoted by the station.

Family Therapy Center: The center serves individuals, couples, and families who seek understanding and resolution of problems associated with their relationships. Problems may include communication, relationship conflicts, child and adolescent problems, family violence, substance abuse, divorce, parent-child conflict, sexual abuse, depression, and anxiety. The FTC is operated as part of the graduate program in Couple and Family Therapy, which is accredited by the Commission on Accreditation for Marriage and Family Therapy Education. The center is located in the Alba Bales house. FTC therapists, staff, and faculty are Safe Zone Allies.

Germans from Russia Heritage Collection (GRHC): Located in the NDSU Libraries, GRHC was established in 1978. Their mission is to collect, document, preserve, exhibit, translate, publish, promote, and make accessible resources on the culture, history, folklore, textiles and clothing, and foodways of the Germans from Russia, particularly the Hassarabian Germans, Black Sea Germans, Crimean Germans, Dobrudjana Germans, Volga Germans, Volhynian Germans, and their descendants in North Dakota and the Northern Plains. In various ways, GRHC affirms the heritage of the Germans from Russia as an important part of the Northern Plains culture. GRHC has one of the most comprehensive collections world-wide, outreach programs, an active oral history program, and continuing education.

Germans from Russia Heritage Collection (GRHC):

Great Plains Institute of Food Safety (GPIFS): The GPIFS ensures the safety and security of our food supply using a tripartite approach to food safety with education and outreach, service, and research components. Faculty participants of GPIFS come from a wide variety of disciplines allowing us to apply multidisciplinary approaches to problems all along the food chain, i.e., from farm-to-fork. All participants are avid teachers and researchers, each dedicated to serving the public’s food safety needs. Our researchers use “state-of-the-art” approaches to provide for early detection of food safety problems, their prevention, or amelioration.

Group Decision Center: A mobile facility that hosts and facilitates group data collection using an electronic medium. Group information is collected through the means of an electronic discussion software tool. The center hosts various meeting styles, all participants to be both anonymous and simultaneous. Web-based surveys allow information to be gathered quickly from a large number and variety of participants. The center staff works with clients from the campus and business communities to develop effective meetings and surveys.

Institute for Business and Industry Development: IBID assists beginning inventors and entrepreneurs with information so they can understand the pathway to product commercialization whether they are in the product concept, design, or production stages. It assists in preliminary technical evaluation of design and manufacturing issues as well as marketing issues, and performs a preliminary search of patent and trademark literature. IBID links individuals with resources at NDSU or other research universities as well as business planning and marketing resources to support commercialization efforts.

Institute for Natural Resource and Economic Development (INRED): The grant-driven institute offers professional services in four major areas – economic feasibility analysis, economic and fiscal impact assessments, analyses of natural resources management, and investigation of population and labor force dynamics. In addition to institute personnel, unique expertise from both public and private sectors in the region, nation, and world are accessed as needed to meet research and training requests. Initially founded as the Northern Plains Natural Resources Institute in 1984, the name was changed in 1995.

Institute of Barley and Malt Sciences: The Institute of Barley and Malt Sciences provides reliable, high-quality, targeted research and education for U.S. barley producers and domestic and international malting and brewing industries at a single site.

International Water Institute: The International Water Institute was conceived by the International Flood Mitigation Initiative (IFMI) in 2000 and provides oversight for the Red River Center for Watershed Education and the Center for Flood Damage and Natural Resource. The institute began working with Tri-College University, a collaborative (501c3) effort between North Dakota State University, Concordia College and University of Minnesota Moorhead to develop an administrative framework that preserved the institute’s international mandate and basin-wide scope.

North Dakota Institute for Pharmaceutical Care: The institute is an outreach arm of the College of Pharmacy, Nursing, and Allied Sciences. Initiated in 1996 and reorganized in 2003, their purpose is to help pharmacists improve their practice and provide them with a ready source of health and drug information and assessment skills. The institute also provides information concerning an array of certificate training programs in pharmaceutical care and provides follow-up support to pharmacists who are implementing a program.

North Dakota Institute for Regional Studies: Founded in 1950, the institute coordinates activities of NDSU in regional scholarship. Their mission is to foster understanding of regional life through research on, teaching about, and service to those regions with particular import to NDSU. These regions include the Red River Valley, the state of North Dakota, the Plains of North America (including the Great Plains of the United States and the Prairies of Canada), and comparable regions of other continents. In keeping with the land-grant university tradition, both knowledge and application are pursued. Institute activities include four categories: collections, publications, outreach, and the Center for Social Research. Institute research collections are housed in the Institute Room in the Skills and Technology Center, 1305 19th Ave. N., Fargo, under the curatorship of institute staff. The publications programs are housed in the College of Arts, Humanities and Social Sciences. Outreach activities involve various units of the university and include radio and television production, public programs, and oral history.

North Dakota Agricultural Weather Network (NDAWN): NDAWN is comprised of 67 automatic weather stations throughout North Dakota and the Red River Valley. The network is designed to monitor and record local weather conditions and disseminate information through its Web site or in near real time over the phone. The data is timely, available, detailed, accurate, and released through a comprehensive array of applications, summaries, and interactive displays, free to all.

North Dakota Kids Count: Established in 1986, the center was transferred to NDSU in 2000. Its primary research mission is to track the status of the health and well being of children in North Dakota. It is part of a national network of Kids Count programs that exist in every state and is sponsored by the Annie E. Casey Foundation. The center serves as a clearinghouse for data reflecting children's education, social, economic, and physical well being.

North Dakota State Data Center: Established in 1991, it serves as the lead agency for a network of affiliate centers throughout North Dakota and works in cooperation with the U.S. Bureau of the Census to receive and distribute economic and demographic information. Services include responding to requests, conducting research, compiling information, and disseminating research findings to meet the demographic and economic needs of North Dakota.

North Dakota Transportation Technology Transfer Center: Established in 1984, the center is tasked under the Federal Highway Administration Local Technical Assistance Program and networked with 57 other centers nationwide. The center is dedicated to exchanging transportation related technology, innovations, and research with local government and transportation units in North Dakota. Technical assistance, information services, and training are provided through videotape and publication libraries, newsletters, interactive distance communications, and onsite extension services.

ND Veterinary Diagnostic Laboratory: The laboratory provides high quality diagnostic service to veterinarians, the animal industry, and the public health sector of North Dakota and the region.

North Dakota Water Resource Research Institute: The institute is one of 54 federally-sponsored entities known collectively as the National Institutes for Water Resources to conduct research, education, and information transfer on water resources. The primary goal is to coordinate research projects that address water problems of North Dakota and the region. The institute awards competitive graduate research fellowships.

North Dakota Agricultural Weather Network (NDAWN): The institute's international mandate and basin-wide scope.
Northern Crops Institute (NCI): The NCI is a regional institute including North Dakota, Minnesota, South Dakota, and Montana. The mission of NCI is to benefit farmers and the regional economy by providing educational and technical service programs that support the promotion and market development of northern-grown crops into domestic and export markets. Programs serve buyers and processors of Northern-grown crops, producer commodity organizations, agricultural groups and agencies, and others in agribusiness impacted by world trade.

Northern Plains Ethics Institute (NPEI): The NPEI provides a forum for democratic deliberations about the future of the Northern Plains. The institute includes think tanks that address the broad themes of education, security, business, healthcare, environment, and culture, and works to develop more as issues warrant. The underlying vision for the NPEI is that the health of our society must be the focus of citizens’ participation: this follows the dictum, “Education is first for responsible citizenship.” The institute, accordingly, sees its area of responsibility both inside NDSU and in the public arena of the Northern Plains.

Oilseed Development Center of Excellence: The mission of this research center is: 1) to facilitate the sustainable long-term development of oilseed agriculture in North Dakota and 2) to establish an organization to provide ongoing multi-disciplinary research and outreach that facilitates and encourages commercialization of agricultural technology in North Dakota.

Plant Diagnostic Laboratory: For decades, the NDSU Plant Diagnostic Lab has helped individuals and professionals in agriculture and horticulture identify plant problems. Since 2002, it has been a member of the Great Plains Diagnostic Network (a region of the National Plant Diagnostic Network, or NPDN). A goal of this network is to enhance our ability to detect and diagnose high-risk plant problems earlier. Every state with a land-grant university has a related lab like this one, and all are members of the NPDN.

Quentin N. Burdick Center for Cooperatives: Created in 1992, the center is endowed by cooperatives to provide education, research, and outreach to cooperatives, organizations, or other interested persons. Education includes teaching and preparing materials for university courses on cooperatives and conducting training programs for cooperatives. Research is conducted on general issues affecting cooperatives including specific, confidential research on marketing and feasibility studies. Outreach includes providing direct assistance to cooperatives and supporting professional co-op organizations.

Robert Perkins Engineering Computer Center: The center assists North Dakota industries with the use of a communication network of sophisticated industrial tools through Computer-Aided Design and Computer-Aided Manufacturing systems. All of the high-technology programs are currently directed toward the economic development of existing industries.

Skills and Technology Training Center: The STTC (Fargo) was established in 1997 to benefit the southeast workforce training region of North Dakota. It is a division of North Dakota State College of Science’s “College Outreach Division.” The STTC is a public/private organization focused on providing training opportunities for business and industry in Fargo-Moorhead and the surrounding area.

Small Business Institute: The institute provides customized, in-depth, confidential consulting to regional businesses in strategic planning, supply chain management, operations and productions, technology transfer, and marketing.

Upper Great Plains Transportation Institute: Created by the North Dakota Legislature in 1967, the institute focuses on improving transportation for people in small urban and rural settings. Its goal is to enhance economic efficiency, increase competitiveness, improve mobility, and promote safety. The institute participates in interdisciplinary graduate degree programs, including a Ph.D. program in transportation and logistics.

Value-added Processing Center: The center generates and disseminates information to help growth of the food and agricultural processing industry in North Dakota. Its objective is to add value to the agricultural materials produced in the state, thereby contributing to the development of North Dakota’s economy.

**Rights and Responsibilities**

**Student Behavior**

Every NDSU student has the responsibility to observe and to help maintain a code of personal behavior and social relationships that will positively contribute to the educational effectiveness of the university. To this end, students are expected to observe the university standards published in this Code, and those outlined in any other university policies, regulations, contracts, or license contracts published elsewhere. In addition, students are expected to observe the laws of the community, the state and the nation. These behavioral standards apply to all students who have been admitted to the university, to previously enrolled students for any act committed while they were enrolled students, to students otherwise associated with the university, and to all visitors as long as they are on campus. The complete document on university regulations and policies relevant to student life is entitled “Rights & Responsibilities of Community: A Code of Student Behavior” and is available from the Office of the Dean of Student Life, 250 Memorial Union, or online.

**Privacy of Student Records**

The disclosure of student educational records is governed by policies developed by NDSU in compliance with state and federal law, including the Family Educational Rights and Privacy Act of 1974 as amended (FERPA). There are essentially two types of student records, directory information and nondirectory information. Directory information may be released publicly except in cases where students have specifically requested that the information not be released. Nondirectory information, which includes the academic transcript, is considered confidential and will not be released, other than to authorized third parties or as allowed by law, without the written authorization of the individual. NDSU may forward academic records to other post-secondary institutions that have requested such records and in which the student intends to enroll.

University policies relative to student records are specified in the FERPA annual notice, which is available online in the “NDSU Policy Manual,” Section 600, and contained in the publication entitled “Rights & Responsibilities of Community: A Code of Student Behavior,” which may be obtained from the Office of the Dean of Student Life, 250 Memorial Union. Questions about FERPA or about restricting the release of directory information may be directed to the Office of Registration and Records, 110 Ceres.

**E-mail Policy**

Electronic mail (e-mail) is an official means by which the university may communicate with admitted and enrolled students. NDSU exercises the right to send e-mail communication to students and expects that e-mail communication is received and read by students in a timely manner. E-mail addresses are assigned by NDSU Information Technology Services. Official e-mail communication includes messages regarding university business sent from NDSU faculty, staff, or administration to a student or group of students. As with any other online service, students are required to comply with all institutional and University System policies and procedures, including NDUS 1901.2 Computer and Network Usage, and NDSU 158: Acceptable Use of Electronic Communications Devices, and relevant local, state, and federal law. It is a violation of policy to share usernames and passwords as potentially sensitive information may be transmitted via e-mail. Students have the responsibility to recognize that certain communication is time sensitive and to frequently monitor their e-mail for official campus communication. Students with disabilities who are unable to use e-mail as an official means of university communication may request an exemption to this policy in the form of an alternate format accommodation. Additional requirements may be imposed by other departments.

**Equal Opportunity Policy**

NDSU is fully committed to equal opportunity in employment decisions and educational programs and activities, in compliance with all applicable federal and state laws including appropriate affirmative action efforts, for all individuals without regard to race, color, national origin, religion, sex, disability, age, or Vietnam-era veteran status, sexual orientation, status with regard to marriage or public assistance, or participation in lawful activity off the employer’s premises during non-working hours which is not in direct conflict with the essential business related interests of the employer.

More specifically, the university abides by the requirements of Title VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973 as well as the implementing regulations of the U.S.

Inquiries concerning compliance may be directed to the NDSU Executive Director/Chief Diversity Officer, 202 Old Main, 231-7703, or to the Office for Civil Rights, Chicago Office, U.S. Department of Education, 111 N. Canal Street, Ste. 1053, Chicago, IL 60606-7204, 312-886-8434, 312-553-4888 (fax), 877-521-2172 (TDD), OCR.Chicago@ed.gov. The complete and current policy may be viewed online at www.ndsu.nodak.edu/policy/100.htm.

Anti-Harassment Policy (www.ndsu.edu/policy/163.htm)

NDSU is committed to providing a climate that fosters respect for students, staff, and faculty as well as others who participate in programs and activities at the university. As part of that commitment, NDSU prohibits harassment based on gender, race, color, religion, national origin, age, disability, sexual orientation, or protected activity (such as reporting alleged harassment or providing information related to a grievance). This policy is in compliance with federal civil rights laws and agency regulations and guidance implementing these laws. Please note that harassment in electronic forms is also prohibited under NDSU Policy 710 - Computer Facilities.

Anyone who feels she/he has been subjected to prohibited harassment is encouraged to report the situation before it becomes severe or pervasive. Individuals may make a report to the Executive Director/Chief Diversity Officer, the university’s General Counsel, the Office of Human Resources/Payroll, the Counseling and Disability Services Office, the Associate Director for Student Rights and Responsibilities, or an appropriate administrator. Reports may be addressed on an informal basis at the request of the individual alleging harassment. The person alleging harassment may also file a formal grievance in the Office for Equity and Diversity using the Equal Opportunity Grievance Procedures described in NDSU Policy 156. The university will not tolerate adverse actions/retaliation toward anyone who, in good faith, alleges harassment or who provides information related to a grievance. Such retaliation may be the basis for an additional grievance. The complete and current policy may be viewed online.

Sexual Harassment Policy (www.ndsu.edu/policy/162.htm)

As part of its commitment to equal opportunity, NDSU prohibits sexual harassment of its employees and students, including student-to-student and other peer sexual harassment. This policy is in compliance with federal regulations implementing Title VII of the Civil Rights Act of 1964 and Title IX of the Education Amendments of 1972. Please note that sexual harassment in electronic forms is also prohibited under NDSU Policy 710 - Computer Facilities.

Individuals concerned about violations of this policy should request assistance from the university’s Executive Director/Chief Diversity Officer, the university’s General Counsel, the Counseling Office, Disability Services Office, the Associate Director for Student Rights and Responsibilities, or an appropriate administrator. The complete and current policy may be viewed online.

Consensual Relationships Policy (www.ndsu.edu/policy/1621.htm)

Consensual relationships that are of concern to NDSU are those romantic or sexual relationships in which both parties appear to have consented, but where there is a definite power differential within the university between the two parties.

Consenting romantic and sexual relationships between instructors (meaning all who teach at the university – faculty members, other instructional personnel, and graduate or undergraduate students with teaching, advising, or tutorial responsibilities) and student (meaning anyone possessing the necessary qualifications to teach at the university) have the potential for extremely serious consequences and ought to be avoided. This list is not all-inclusive, but gives examples of the types of relationships covered by this policy.

Because of the possible difficulties associated with the power differential and because of potential conflicts of interest, NDSU discourages all such consensual relationships. However, if a romantic or sexual relationship exists or develops between individuals having a power differential within the university, the person with greater power shall report it to an appropriate supervisor. For example, an instructor shall report the matter immediately to the department chair; a teaching assistant shall report it to the professor in charge of the course; and an employee shall report it to his/her supervisor. In each case, the administrative supervisor shall make suitable arrangements for the objective evaluation of the student’s, employee’s, or prospective employee’s academic or job performance and for the protection of individual and university interests. The complete and current policy may be viewed online.

Sexual Assault Student Policy (www.ndsu.edu/policy/603.htm)

NDSU commits its resources to the following twofold process: 1) to provide crisis intervention and a judicial/disciplinary response for victims and alleged offenders, and 2) to educate and promote discussion on interpersonal abuse and violence.

Persons having knowledge about sexual assaults involving members of the NDSU campus community are urged to contact University Police at 231-8998 or at Thorson Maintenance Building. Contacts may also be made at the Office of the Dean of Student Life, 250 Memorial Union, 231-6537, or the Department of Residence Life, Bison Court West, 231-7557.

Sexual assault is viewed as any sexual behavior between two or more people to which one person does not or cannot consent. NDSU relies upon North Dakota state law concerning sexual imposition which is much broader than the traditional concept of rape. NDSU prohibits sexual acts or contacts with others which can involve compelling a victim to submit to sexual acts or contacts by force or threat of force, use of intoxicants to substantially impair the victim’s power to give consent, engaging in such acts when there is reasonable cause to believe the other person suffers from a mental state which renders him or her incapable of understanding the nature of the contact, or where the victim is a minor. A complete copy of the current policy, reporting procedures, and related information is available from the Office of the Dean of Student Life, 250 Memorial Union, or online.

Use of Alcohol and Other Drugs (www.ndsu.edu/policy/155.htm)

NDSU complies with and supports the North Dakota State Board of Higher Education policy governing alcohol use on campus, the Drug Free Workplace Act of 1988, Public Law 100-690 and the Drug-Free Schools and Communities Act Amendments of 1989, Public Law 101-226. The State Board of Higher Education prohibits the possession, sale, dispensation, use or consumption of alcoholic beverages upon land or in buildings owned by the Board or its institutions. Exceptions may include the lawful possession of alcohol in family student residences, on-campus professional staff residences, fraternities and sororities (in certain circumstances), the president’s residence, and other special exceptions as granted by the president or the president’s designee. For the complete State Board of Higher Education policy, see www.ndsu.edu/policies (number 918 “Alcoholic Beverages”). The university prohibits the unlawful or unauthorized use, possession, storage, manufacture, distribution, or sale of alcoholic beverages and any illicit drugs or drug paraphernalia in university buildings, any public campus area, in university housing units, in university vehicles, or at any university affiliated events held on or off-campus, which are sponsored by students, employees, and their respective campus organizations (including all fraternities and sororities). For NDSU employees, compliance with this policy is a term and condition of employment. For NDSU students and student organizations, compliance with this policy is a term and condition of continued enrollment/organizational registration. The complete and current policy may be viewed online.

Campus Security (www.ndsu.nodak.edu/ndsu/police_safety/policy/ndsu_personnel_safety.html)

NDSU complies with the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act. This law was renamed in 1998 and was formerly known as the Student Right-to-Know and Campus Security Act of 1990. Policies, prevention, services, and crime statistics are available at the Office of the Dean of Student Life, 250 Memorial Union; the University Police Department, Auxiliary Building; or online.

Problems/Complaints

The Vice President for Student Affairs Office has established a procedure for students to file complaints, concerns or issues. The purpose of the procedure is to provide an orderly collection of information, address students’ complaints in a timely manner by appropri- ate university personnel, and help students learn effective conflict resolution skills.

A form is available in the Vice President for Student Affairs Office, 100 Old Main, or the Dean of Student Life Office, 250 Memorial Union, to assist students in stating the problem and desired problem resolution. Students also may arrange a meeting with the Associate Director of Student Rights and Responsibilities, 250 Memorial Union, at any time during the process for advice and direction in resolving the problem.

ENROLLMENT INFORMATION

Admission (www.ndsu.edu/prospective_students)

Campus Visits

Anyone interested in attending NDSU as an undergraduate student should contact the Office of Admission, 124 Ceres Hall, for application procedures and information. Office of Admission staff welcome and encourage inquiries about NDSU student life.
Admission Policies

Admission policies and practices reflect the university's commitment to equal opportunity.

Admission of Freshmen

In compliance with State Board of Higher Education policy, applications are reviewed on the basis of high school core course requirements, ACT or SAT scores, and grades, with special emphasis placed on grades in the core courses.

Application Procedures

To be considered for freshman admission, submit the following:
1. A completed application for admission and a $35 nonrefundable application fee;
2. An official transcript of all high school credits sent by the high school, and official transcript(s) of any subsequent postsecondary coursework;
3. Scores from the American College Test (ACT) (NDSU's code number is 3202) or from the Scholastic Aptitude Test (SAT) (code number is 6474), if applicant is under 25 years of age.

Academic Eligibility

A prospective student must complete the following high school core curriculum unit requirements (one unit equals one full year of study):
1. Four (4) units of English
2. Three (3) units of mathematics (at the level of algebra I and above)
3. Three (3) units of laboratory science
4. Three (3) units of social studies

Admission decisions are based on the total high school record. Completion of the core curriculum requirements previously listed does not automatically guarantee admission to NDSU. In addition to fulfilling the core requirements, grade-point average in the core courses, and ACT or SAT scores are considered in evaluating an application. The general guidelines used in making admission decisions include a cumulative high school grade-point average of 2.5 (4.0 scale) in core courses and an ACT composite score of 21 or an SAT score of 970 or higher. Students who do not meet these guidelines will be considered if other supporting factors show potential for success.

Note: North Dakota State Board of Higher Education requires verification of measles, mumps, and rubella immunizations for all students born after December 31, 1956.

Admission of Transfer Students

Refer to the section on Academic Policies for information on evaluation of transfer credits. Students who have previously attended NDSU should refer to the section on readmission of returning students.

Application Procedures

Students interested in transferring to NDSU must present the following to be considered for admission:
1. Completed application for admission and a $35 nonrefundable application fee;
2. Official high school transcript, complete with graduation date, if fewer than 60 semester credits (90 quarter credits) of transferrable college work have been completed;
3. Official transcripts from all colleges previously attended. Transfer students are not at liberty to disregard any part of their previous college record. Failure to report all college and university work attempted may result in dismissal or loss of credit or both;
4. An ACT or SAT score is required unless applicant:
   a. Is 25 years of age or older on the first day of class;
   b. Has completed 24 semester (36 quarter) credits of college work;
   c. Has military service (Exemptions granted on a case-by-case basis.).
An admission decision will be based on a review of your total academic record. If you have earned fewer than 24 transferrable college credits at the time of application, your high school records will be taken into consideration, along with your GPA in college coursework.

If you have earned more than 24 transferrable college credits, a decision will be based on your cumulative GPA from all previously attended post-secondary institutions.

Our general recommendation is that all applicants present at least a 2.0 GPA in all college coursework to be considered for admission.

The Office of Registration and Records administers the NDSU policies governing the acceptance of credit from outside institutions. Before credits may be evaluated for specific NDSU course equivalence or application to a departmental program, transfer courses must be accepted for university credit. Transfer credits are evaluated as soon as possible after final and official transcripts from each institution have been received. Refer to the section on Academic Policies for evaluation of transfer credits.

Note: Students who have been suspended from another institution may not be considered for admission to NDSU until the suspension has been lifted by that institution or until one year has elapsed.

Supplemental Applications

In addition to completing the preceding procedures, several academic departments require a supplemental application for transfer students seeking admission to the professional-level programs.

Admission of Early-Entry Students

High school juniors and seniors wishing to take coursework at NDSU prior to high school graduation may enroll as an early-entry student. Submit all of the following:
1. Completed application for admission and a $35 nonrefundable application fee;
2. High school transcript;
3. Early-entry permission form signed by a parent or guardian and by a high school counselor or principal;
4. Students seeking early-entry status must show evidence of strong academic ability and adequate progress toward meeting the core curriculum requirements. Credit earned will be made official upon receipt of the final high school transcript;
5. College credit may apply toward high school graduation requirements. Students should consult their high school policy regarding this issue and must initiate the Dual Credit Enrollment Application with the high school counselor.

Note: A cumulative grade-point average of 3.5 is recommended; however, each application will be reviewed on an individual basis.

Admission of Non-Degree Seeking Students

Special student status is reserved for non-degree seeking students who have already obtained a high school diploma or GED and wish to enroll in a limited number of courses at NDSU. Special students are permitted to register for up to 15 credits without submitting official transcripts (unless college coursework was attempted within one year prior to application). Interested students should request and submit to the Office of Admission a Special Student Status Application and a $35 nonrefundable application fee. If students wish to take additional courses or become degree-seeking, appropriate high school and/or college transcripts must be submitted to be considered for admission.

Students currently enrolled at another college or university and planning to take limited coursework at NDSU with intention of transferring NDSU credits to their home institution should follow application procedures for special student status.

Admission by Examination (GED)

Persons 19 years of age or older may substitute satisfactory scores on the General Education Development (GED) tests in place of a high school diploma. North Dakota residents may take these tests by appointment at the NDSU Counseling Center or at high schools throughout the state. Others should consult with schools in their home state for details about testing centers.

Students who present an overall average score of 450 on the GED with no subject score lower than 410 will be considered for admission to the university. ACT/SAT scores are required if applicant is under 25 years of age.

Admission of International Students (www.ndsu.edu/International)

Admission of undergraduate international students is determined by a selective admission process that includes consideration of English language proficiency, academic achievement, and financial resources. For information specific to graduate students, refer to the Graduate School Web site or contact The Graduate School.

International Student Deadlines

Deadlines for international applications are May 1 for Fall Semester and October 1 for Spring Semester. For an application to be processed, it must be accompanied by a nonrefundable application fee of $35 U.S. submitted in the form of a check (postal or money order) drawn on a U.S. bank and payable to North Dakota State University.
Enrollment Information

English Language Proficiency
Scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) must be submitted by prospective international students at the time of application. The minimum required TOEFL score for unconditional acceptance is 525 (paper test); 193 (computer test); or 70 (Internet test). The minimum required IELTS score for unconditional acceptance is 5.5. Undergraduate students receiving TOEFL scores between 460-524 (paper test); 140-190 (computer test); or 48-69 (Internet test); or an IELTS score of 4.5-5.0 and graduate students with scores between 500-524 (paper test): 173-190 (computer test); or 61-69 (Internet test) may receive conditional acceptance with attendance at NDSU’s Intensive English Language Program required (see section on Intensive English Language Program). Arrangements to take the TOEFL or IELTS may be made by visiting www.toefl.org or www.ielts.org or by inquiring at the nearest U.S. Consulate or binational center. Applicants should have their scores sent directly from the testing agency to the Office of International Programs, North Dakota State University, PO Box 5582, Fargo, North Dakota 58105, U.S.A. Test results that are more than two years old will not be considered.

Academic Achievement
Applicants are required to furnish an original or certified copy of an official academic record from all secondary schools and all colleges, universities, and professional schools attended (see Certification of Credentials from Abroad). The academic record must show all marks or grades received in each subject for each school year and any certificates, diplomas, or degrees awarded, including all subjects passed and grades or marks earned on government or university examinations. If the academic record is not in English, a certified literal translation must be sent in addition to the official record.

Students applying directly from their home countries who have not completed any coursework in the U.S. should rank in the upper third of their class or have the equivalent to a B average in the U.S. Other factors, such as personal recommendations and test results, for example, scores on the Scholastic Aptitude Test (SAT), also will be considered, but are not required. Additional requirements for selective admission programs are outlined in the appropriate college section in this bulletin.

Financial Resources
Certification of adequate financial support is required from all international undergraduate applicants other than permanent residents of the U.S., parolees, refugees, U.S. trust territory applicants, or immigrants. Admission will not be granted until proof of funds for the duration of study has been submitted. A special North Dakota State University International Student Financial Certification Form must be completed for this purpose. Failure to complete this certification and submit supporting documents will delay admission decisions and the issuance of the appropriate immigration forms. Applicants must be prepared to pay tuition and fees, as well as costs for living expenses, for their entire stay at the university. A detailed summary of expenses is included in the international application packet. Each student should become familiar with his/her financial needs based on that summary.

Health Insurance
All international students are required to purchase the health insurance policy specified by the state of North Dakota. No other policy may be substituted. The fee for health insurance for one year must be paid upon arrival and at the beginning of each subsequent year. In addition, the state of North Dakota requires proof of immunity to measles, mumps, and rubella prior to registration for courses. Tuberculosis (TB) screening is required prior to registering for classes for students living in or who have arrived within the past five years from countries where TB is endemic.

Transfer of Funds
Before departing for the United States, students should become thoroughly familiar with their home government’s regulation for exchanging and forwarding money.

Transfer International Students
Undergraduate students transferring from U.S. colleges or universities should have a cumulative grade-point average of 2.5 or higher on a 4.0 scale, except for applicants to selective programs, such as engineering, which require higher minimum grade-point averages. Admission decisions are based on academic coursework, as well as on the capability of the university to accommodate additional international students. Applications from students already studying in the U.S. are considered if their file is complete by June 15 for Fall Semester and November 1 for Spring Semester. Any academic coursework accepted for transfer by the university is subject to departmental approval. Evaluation of transfer credits normally will not be completed until the applicant has arrived on campus and criteria needed to determine NDSU equivalency are identified. If credits are missing from the transcript, a professional evaluation may be required in order for transfer credit to be granted. Applicants seeking transfer credits for higher education work completed outside the United States should bring with them a detailed syllabus for each course. A student must be able to provide a full description of prior coursework to his/her academic advisor to facilitate the evaluation of transfer credits. All international students currently studying in the United States must submit the Transfer Information Form as part of the application. This form is to be completed by the applicant and the applicant’s present or most recent international student advisor.

Certification of Credentials from Abroad
The appropriate school authority that issued the original academic record should make a photocopy of the applicant’s papers and certify that it is a true copy by placing the institution’s stamp or seal and the official’s signature on the photocopy. Copies of transcripts issued by one institution but certified by another institution will not be accepted from abroad. Students presently attending a college or university in the United States may have the admissions officer at their current institution send certified copies of their foreign academic records to North Dakota State University if the records were originally certified by the appropriate institutions. University work completed at one institution but listed on the record of a second institution will not be considered without a separate record from the institution where the work was originally completed.

Intensive English Language Program
An Intensive English Language Program is offered year round and is open to international visitors and graduate and undergraduate applicants who plan to enroll at North Dakota State University. The course is designed for individuals whose scores on the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) do not meet minimum standards and who are required to participate as a condition of admission to the university or as a condition of being awarded a teaching assistantship. The full-time, intensive course is offered every summer for five weeks and fall and spring for 15 weeks. No college credit is given and students attend at their own expense. For more information, contact the Office of International Programs, PO Box 5582, Fargo, North Dakota 58105-5582 U.S.A., telephone: 231-7895, fax: 231-1014, e-mail: ndsu.international@ndsu.edu or visit the Web site.

Admission of Graduate Students (www.ndsu.edu/gradschool)
For admission requirements to graduate programs, refer to the bulletin section for the College of Graduate and Interdisciplinary Studies or call 231-7033.

Readmission of Returning Students
Returning students are those who have previously attended NDSU and are returning after a leave of absence of at least one full term, or following an academic suspension, exclusive of summer session. Returning undergraduate students should contact the Office of Registration and Records at least 30 days prior to their expected return so that records may be updated to permit further registration. Returning graduate students should contact the Graduate School for readmission information. Students who have enrolled in courses at other institutions since leaving NDSU must arrange for official transcripts to be sent to the Office of Registration and Records, PO Box 5196, Fargo, ND 58105. Reactivation/Petition for Readmission forms are available online at www.ndsu.edu/bisonconnection. Failure to list all colleges, universities, and schools attended while away from NDSU may result in denial of readmission, rescission of admission, dismissal, loss of credit(s), or other appropriate sanctions.

Selective and Limited Admission Programs
Admission to a number of programs is selective and/or limited. Admission to the university does not guarantee entrance to a specific major. Supplemental applications may be required for students seeking admission to the professional-level programs. Some programs require that minimum standards be met and maintained for continuous enrollment and advancement in the program. Contact the respective department for further admission criteria and application deadlines for the following programs:

Accountancy
Agricultural Communication
Architecture
Business Administration
Clinical Laboratory Science
Computer Engineering
Construction Engineering
Construction Management
Dietetics
Electrical Engineering
Environmental Design
Exercise Science
Finance
Health Communication
Approximate Undergraduate Costs to Attend NDSU, 2008-2009

<table>
<thead>
<tr>
<th>Program</th>
<th>When the fee will be assessed</th>
<th>2008-09 fee amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture &amp; Landscape</td>
<td>Students who have been accepted into the second-year design studio</td>
<td>33% of ND tuition rates ($72.38/credit or $868.56/semester)</td>
</tr>
<tr>
<td>Athletic Training</td>
<td>Students accepted into the program</td>
<td>$500/semester - master's $250/semester - undergrad</td>
</tr>
<tr>
<td>Coordinated Program in Dietetics (CPD)</td>
<td>Students who have completed 60 or more total credit hours</td>
<td>$600/semester</td>
</tr>
<tr>
<td>Didactic Program in Dietetics (DPD)</td>
<td>Students who have completed 60 or more total credit hours</td>
<td>$175/semester</td>
</tr>
<tr>
<td>Education</td>
<td>Students accepted into 400-level classes</td>
<td>$875 one-time fee</td>
</tr>
<tr>
<td>Engineering</td>
<td>All full-time and part-time students</td>
<td>$27.33/credit or $326/semester</td>
</tr>
<tr>
<td>Exercise Science</td>
<td>Students accepted into the second-year curriculum</td>
<td>$285/semester</td>
</tr>
<tr>
<td>Health Educ &amp; Physical Educ</td>
<td>Students accepted into the second-year curriculum</td>
<td>$285/semester</td>
</tr>
<tr>
<td>Interior Design</td>
<td>Students who have passed their sophomore review</td>
<td>$250/semester</td>
</tr>
<tr>
<td>Marriage &amp; Family Therapy (grad program)</td>
<td>Students accepted into the program</td>
<td>$250/semester</td>
</tr>
<tr>
<td>Nursing</td>
<td>Students accepted into the professional program after completion of the pre-nursing curriculum</td>
<td>$300/semester</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Students formally accepted into the professional Pharm.D. program</td>
<td>Equal to ND tuition rate $2,632/semester</td>
</tr>
<tr>
<td>Sport &amp; Recreation Studies</td>
<td>Students accepted into the second-year curriculum</td>
<td>$285/semester</td>
</tr>
</tbody>
</table>

Expenditures

- **ND resident**
  - Tuition (12 or more credits per semester) $2,632/semester, $5,264/year
  - Student fees $481/semester, $962/year
  - Room and Board $3,500/semester, $7,000/year
  - Books and supplies $350/semester, $700/year
  - Total $13,146/semester, $26,292/year

- **MN resident**
  - Tuition (12 or more credits per semester) $2,752/semester, $5,504/year
  - Student fees $481/semester, $962/year
  - Room and Board $3,500/semester, $7,000/year
  - Books and supplies $350/semester, $700/year
  - Total $13,386/semester, $26,772/year

- **Tuition Exchange States**
  - Tuition (12 or more credits per semester) $3,947/semester, $7,894/year
  - Student fees $481/semester, $962/year
  - Room and Board $3,500/semester, $7,000/year
  - Books and supplies $350/semester, $700/year
  - Total $15,777/semester, $31,554/year

- **Other non-residents**
  - Tuition (12 or more credits per semester) $7,026/semester, $14,053/year
  - Student fees $481/semester, $962/year
  - Room and Board $3,500/semester, $7,000/year
  - Books and supplies $350/semester, $700/year
  - Total $21,935/semester, $43,870/year

2. Students carrying fewer than 12 credits per semester will pay tuition and required fees on a prorated basis.
3. Room and Board cost shown is based on a double room and 20-meal plan. A student in a double room with the 15-meal plan would pay $2,634 fall semester and $5,268 per year.
4. In addition to the listed costs, students should plan approximated costs of $1,300 per semester and $2,600 per year for personal expenses and transportation.

**Tuition and Fees**

(www.ndsu.edu/bisonconnection/accounts)

Current tuition rates and required fees are available on the Bison Connection Web site. This Web site also contains additional items including payment information, withdrawal information, and important dates and deadlines.

**The following is a list of additional charges beyond tuition:**

**Distance and Continuing Education Tuition and Fees**

Degree credit courses offered through Distance and Continuing Education are billed on a per credit basis at the North Dakota resident tuition and fee rates. These courses are not covered under the tuition cap, are not eligible for NDSU tuition waivers, and may not be taken via Tri-College. National Guard members may be eligible for a 25% tuition waiver.

**Self-Support Tuition**

Courses labeled as Self-Support are not supported through state appropriated dollars and are only offered summer semester. These courses are not covered under the tuition cap, are not eligible for NDSU tuition waivers, and may not be taken via Tri-College.

**Student Fees**

Required student fees have been approved by the student body and are charged each term. The maximum charge for the fall and spring semesters is based on 12 credits and the maximum charge for the summer semester is based on 9 credits. The maximum 12-credit rate per session for the 2008-2009 school year is $481.06. The breakdown of student fees per credit consists of the following:

- Activity Fee $10.50
- Union Bond 3.85
- Career Services 1.08
- Technology Fee 6.88
- Health/Wellness Fee 10.17
- ConnectND 6.75
- ND Student Association .03
- Library Fee .83

Total per credit $40.09

**Residence Halls**

Base rate for a residence hall room is $1,461 for Fall 2008 and $1,195 for Spring 2009. A hall dues fee is assessed each year. A $50 application fee is required and will be applied against the room charge. Additional charges also may apply.

**Apartments**

Apartment rates may be found on the Residence Life Web site. A $200 application fee is required and will be applied against the initial rental payment.
Meal Plans
The following meal plans are available for the 2008-2009 school year:
- 20 Meal Plan $1,782/semester
- 15 Meal Plan $1,560/semester
- 10 Meal Plan $1,390/semester

Course and Class Fees
Courses or classes that have additional fees will have the amount listed in the Class Notes of the Class Sections Detail of the Schedule of Classes on Campus Connection.

Other Charges
Application Fee: The application fee of $35 is non-refundable and must accompany the admission application.

Course Audit: The course audit (not for credit) fee is 50% of the North Dakota tuition rate, and is covered under the tuition cap, if applicable.

Course Challenge: Course challenge fee is 50% of the North Dakota tuition rate. The fee is paid after approval of the petition to challenge, but before the special examination is administered. Course Challenges are not covered under the tuition cap.

Interactive Video Networking (IVN) Fee: The IVN fee is 20% of the North Dakota tuition rate. This fee is assessed to classes taken at non-Fargo locations through the use of IVN.

Matriculation Fee: The matriculation fee of $45 is a non-refundable fee for all new students to provide orientation programs, tutoring and retention-related activities.

Parking Permits: NDSU employees and students are assessed $110 per school year to park in university lots. For more information, contact the Parking Office at 231-5771.

Photo ID (Bison Card): All students are required to have an NDSU photo identification card. The purchase of new Bison Cards or replacement of lost cards is $20.

Special Examinations: NDSU serves as a national testing center. Fees vary for different placement and proficiency testing programs. For specific fee information, contact the Counseling Center and Disability Services at 231-7671.

Student Health Service Fees: Payment of student fees entitles a student to the basic services of the Student Health Services at the Wallman Wellness Center. Additional fees are charged for laboratory services, medications, and clinical/medical treatments.

Refund of Tuition and Fees
Students who register for classes are responsible for paying the tuition and fees unless they officially drop, cancel or withdraw by the appropriate refund deadline. Students who have registered for a term and fail to properly follow procedures to cancel or withdraw will be obligated to pay for any balance accumulated for that term. In most cases students are not automatically dropped or withdrawn just because they don’t attend classes. Refund calculations for class drops or withdrawals from the university are calculated in accordance with the North Dakota Board of Higher Education policy 830.2. Detailed information on refunds for drops and withdrawals is available on the Bison Connection Web site www.ndsu.edu/bisonconnection/cas.

Class Drops
A student who drops a class before the class is 9% complete is entitled to a 100% refund of tuition and fees. A refund will not be issued for classes dropped on or after 9% completion. The class length calculation is based on the start and end dates of the class as listed in Campus Connection, and includes all calendar days (including weekends and holidays), not just class days.

Withdrawals to Zero Credits
When a student wishes to discontinue enrollment from all classes and not receive credit for any class(es) within that semester, the student needs to complete the withdrawal process at Bison Connection, Memorial Union. The Withdrawing to Zero Credits form may be found at www.ndsu.edu/bisonconnection. Once a withdrawal is processed, the student cannot re-enroll for that semester. However, the student may still enroll in subsequent semesters.

Refunds resulting from a withdrawal are calculated on each individual class’ completion percentage. Each class could have a different refund percentage. Upon withdrawal from the semester, classes are refunded based on the following schedule:

<table>
<thead>
<tr>
<th>Class percent completed</th>
<th>Percent refunded</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000%-8.999%</td>
<td>100%</td>
</tr>
<tr>
<td>9.000%-34.999%</td>
<td>75%</td>
</tr>
<tr>
<td>35.000%-59.999%</td>
<td>50%</td>
</tr>
<tr>
<td>60.000%-100.000%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Residency and Tuition Reciprocity
The North Dakota Century Code, Section 15-10-19.1, governs determination of residency for tuition purposes.

Resident Guidelines
A North Dakota resident student, for tuition purposes, is defined as follows:
1. A person whose guardian, custodial parent, or parents are legal residents of this state and have resided in this state for 12 months, or a dependent child whose custodial parent moved into the state with the intent to establish legal residency for a period of years within the last 12 months immediately prior to the beginning of the academic term;
2. A person of age 18 or older who is a legal resident of this state and has resided in this state after reaching age 18 for 12 months immediately prior to the beginning of the academic term;
3. A person who graduated from a North Dakota high school;
4. A full-time active duty member of the armed forces or a member of a North Dakota National Guard unit;
5. A spouse or dependent of a full-time active duty member of the armed forces or a member of a North Dakota National Guard unit;
6. A spouse or dependent of a benefitted employee of any North Dakota University System institution;
7. A spouse or dependent of a resident for tuition purposes;
8. A person who was a legal resident of this state for at least three consecutive years within six years of the beginning of the academic term; or
9. A child, spouse, widow, or widower of a veteran who was killed in action or died from wounds or other service-connected causes, was totally disabled as a result of service-connected causes, died from service-connected disabilities, was a prisoner of war, or was declared missing in action.

Note: “Dependent” means only a person claimed as a dependent on the most recent federal tax return.

Minnesota Tuition Reciprocity
Effective September 1975, the states of Minnesota and North Dakota enacted a tuition reciprocity agreement. This means that legal residents of the State of Minnesota may qualify for reduced tuition at North Dakota State University.

Minnesota residents who enroll at NDSU within 12 months of their graduation from a high school in Minnesota need not apply for reciprocity.

All other Minnesota residents should apply for reciprocity at the following Web address: www.getreadyforcollege.org. Questions may be directed to:

Minnesota Office of Higher Education
1450 Energy Park Drive, Suite 350
St. Paul, MN 55108-5227
1-800-657-3866 or 1-651-642-0567

Once reciprocity has been granted by the State of Minnesota, students should print the confirmation letter from the Web site and submit it to the NDSU Office of Registration and Records, 110 Ceres. Tuition will be adjusted accordingly.

Reciprocity must be processed by the last day of the semester the student attends. Refunds will not be processed retroactively.

Note: Returning students who have previously filed for tuition reciprocity but have not enrolled in a course or earned credit at NDSU during the past academic year need to re-file for reciprocity through the state of Minnesota.

Adjusted Tuition for Tuition Exchange States (WICHE/WUE/MHEC/Contiguous)
Legal residents of states that participate in one of the following programs or who reside in a contiguous Canadian province are eligible for adjusted tuition at NDSU.

Western Interstate Commission for Higher Education (WICHE)/Western Undergraduate Exchange (WUE):

Midwest Higher Education Compact (MHEC):
- Kansas, Michigan, Missouri, Nebraska and Wisconsin
Refund percentages may be found at www.ndsu.edu/bisonconnection/cas.

Financial Aid
(www.ndsu.edu/bisonconnection/finaid)

Students attending NDSU for the first time must apply for admission to be considered for financial aid.

All aid applicants will be expected to submit the Free Application for Federal Student Assistance (FAFSA). To be considered for the maximum number of financial aid sources, the FAFSA must be processed on or before March 15. To ensure meeting this deadline, the FAFSA should be submitted online by March 1.

Students are encouraged to complete the FAFSA online at www.FAFSA.ed.gov. Official financial aid award notices are mailed to students in June.

Federal Pell Grants

All students who have not yet earned a baccalaureate degree are eligible to apply for grant assistance under this program. Grant amounts ranging from $400 to $4,310 per year are awarded to students with exceptional need for assistance.

Federal Supplemental Educational Opportunity Grants

These federal grants are awarded to undergraduate students with exceptional need for assistance (Pell Grant recipients must be given priority in the awarding of Supplemental Grants). Amounts range from $700 to $1,500 per year.

ACG/SMART Grants

These are need-based federal grants that require a student to be PELL eligible, a U.S. citizen, enrolled full time, and to maintain a cumulative 3.0 GPA at the time they earn their 24th credit – as well as during their third and fourth years as an undergraduate. ACG recipients must have also completed a rigorous high school program (determined by state and federal government). The SMART grant requires the student be enrolled in specific programs (designated by the Department of Education) during their third and fourth undergraduate years, as defined by the federal regulations associated with the program.

State Grants

North Dakota residents may be considered for an $800 State Grant by completing the FAFSA. Eligibility is based upon need for assistance. Early submission of the FAFSA will ensure priority consideration for the grant.

Loans

The university participates in the Federal Perkins, Nursing, and Stafford Student Loan Programs. The Minnesota Student Educational Loan Fund (SELF) and Parent Loans for Undergraduate Students (PLUS) programs are available to qualified applicants. There are several other alternative loan options available through various lenders.

Rates of interest are below those charged commercially, and borrowers may have up to 10 years after leaving school to repay these loans depending upon the total amount borrowed.

NDSU also offers short-term emergency loans of nominal amounts to qualified enrolled students. Contact Bison Connection.

Withdrawals and Cancellations

Prior to the start of a semester students can cancel their registration by contacting Bison Connection, Memorial Union. Upon cancellation of registration, all financial aid funds are forfeited. Withdrawals to zero credits on or after the start of a semester also are processed at Bison Connection, but institutional refunds are calculated based upon a declining percentage extending through the 60% point of the term. Specific dates and refund percentages may be found at www.ndsu.edu/bsionconnection/cas.

A recipient of Title IV grant or loan funds who withdraws prior to the 60% point of the term and has attended at least one class must have their aid eligibility recalculated to determine the amount of aid earned. The recalculation is based on the number of days in the term and the number of days completed by the student.

A student who does not officially withdraw to zero credits but ceases attendance in all classes prior to the 60% point of the term is considered to be an unofficial withdrawal. No refund of institutional charges is made on an unofficial withdrawal; however, a recalculation of Title IV aid earned is required. The student’s date of withdrawal will be either the last documented date of attendance or the 60% point of the term, whichever is later.

When the withdrawal date is determined, whether on an official or unofficial withdrawal, a Return of Title IV Funds Worksheet will be processed to calculate the institutional refund as well as the unearned Title IV financial aid funds. If aid has already been disbursed to the student, the unearned Title IV funds will be returned using the student’s institutional refund of institutional charges. If the amount of the institutional refund is not enough to reimburse all of the unearned Title IV funds, the student is responsible for paying the balance. If aid has not been disbursed to the student, a post-withdrawal disbursement will be offered to the student, as long as the student is eligible for Federal Title IV assistance. A copy of the Return of Title IV Funds Worksheet will be given to the student at the time of withdrawal. In the event of an unofficial withdrawal, a certified letter will be sent to the student that includes the Return of Title IV Funds Worksheet.

A complete copy of the policy and procedures for withdrawals to zero credits is available at www.ndsu.edu/bisonconnection/forms.

Academic Standards for Federal Financial Aid Eligibility

Students must meet standards of satisfactory academic progress to maintain their eligibility for Title IV financial assistance each year. These standards differ somewhat from the minimum standards set by the university. Changes in registration, such as dropping courses or withdrawing from all courses, may affect financial aid eligibility of applicants and recipients. For details or to obtain a copy of the “Standards of Satisfactory Academic Progress,” contact the NDSU Office of Student Financial Services or view the policy online at www.ndsu.edu/bisonconnection.edu/sfs.

Employment and Work Study

The federal Work-Study program provides jobs both on and off campus during the school year and summer for enrolled students with need for assistance. For non-work study employment, see the Career Center.

Scholarships

High school seniors and incoming transfer students with superior academic credentials are encouraged to contact the NDSU Office of Admission for scholarship information and application forms. Returning and upper-class students should contact their college or department regarding scholarship availability and application procedures. Students may also seek out scholarships offered through non-university sources. Please see NDSU scholarship information online at www.ndsu.edu/bisonconnection/sfs.

STUDENT PROGRAMS AND SERVICES

Diverse services and reinforcement programs are available at NDSU. Each is aimed at enhancing student life by assisting students to gain the maximum benefit from their experiences.

Career Center
(www.ndsu.edu/careercenter)

The Career Center is a comprehensive resource center to assist NDSU students and alumni with their job searches and to connect them with employers.

There are three distinct area of focus: career preparation, cooperative education, and part-time and summer work.

Career preparation: Students are assisted with the process of becoming successfully employed by utilizing the services and resources available to undergraduate and graduate students who are job searching.

Part-time and summer work: Students can utilize the electronic part-time job board to access on and off-campus job postings.

Cooperative Education: This internship-type program blends classroom education with hands-on experience through career-related, paid work experiences for academic credit. Cooperative Education offers specific benefits to students:

• Career-related work experience
• An opportunity to explore a career field
• Earn money
• Receive academic credit

Participation in the co-op program may substantially improve students’ employment opportunities after graduation by providing skill mastery to prospective employers.

The co-op program option is available in most academic departments. Freshmen should begin their career development process by meeting with Career Center staff. Generally, students are qualified to participate in the program during or after their sophomore year. Employment can be full or part-time and must consist of a minimum of 100 hours of work per semester to earn credit. Work experiences can occur during the school year or the summer.
Co-op assignments generate three credits on the student’s transcript depending on the number of hours worked during the semester. There is a cap of 12 co-op credits per student. Cooperative Education registration is offered through Continuing Education and credit is awarded directly by the Co-op Program. Students must make their credit arrangements prior to their Co-op assignment.

Other resources and services available at the Career Center include:
- Instructional Web site
- Professional job search advisors focusing on resume and cover letter development; interview techniques and mock interviews; job search strategies; professional image instruction; federal job and internship information
- Employer recruiting and on-campus interviewing
- Career fairs in the fall include On-campus Job Fair, Meet the Firms (Accounting), Engineering and Tech Expo, Tri-College and Internship Fair, and Tri-College Graduate School Day. Career events in the spring include Spring Career Fair, Design Expo, Summer Job Fair, and the North Dakota Education Career Fair.

Counseling Center (www.ndsu.edu/counseling)
The Counseling Center provides professionally trained counselors to assist students when they need academic, personal or career help. Students may experience problems that range from everyday concerns to those that are more serious; they will find counselors who can provide service and/or referral for a wide variety of concerns. Typical issues include career concerns, choice of major, difficulties with roommates or other relationships, depression, anxiety, eating disorders, alcohol and/or other drug abuse, and problems that relate with academic achievement. Individual and group counseling is offered without cost.

The Counseling Center is open for appointments from 8 a.m.-5 p.m. during the academic year and from 7:30 a.m.-4 p.m. during the summer. There is a walk-in service for those who need immediate assistance. Other students can schedule an appointment at their convenience. Limited psychiatric care is available for a nominal charge. Referrals for this service are made by counseling staff.

Testing service also is available through the Counseling Center. Standardized tests (e.g., GED, ACT, Miller Analogies, PCAT, CLEP) are available. Specific information is available from the Testing Administrator at 231-6317 or at the Web site listed above.

Counseling services are confidential, free and open to NDSU students. The staff follows HIPAA policies and procedures and the Counseling Center is accredited by the International Association of Counseling Services, Inc.

Disability Services (www.ndsu.edu/counseling/disability.shtml)Disability Services (DS) is the designated office for a student with a disability to self-disclose his/her disability and request accommodations. The office serves students with physical, psychological, and learning disabilities. Staff determines eligibility for accommodations and work collaboratively with faculty and staff to implement the accommodation. Accommodations are used to ensure access to the learning environment. Reasonable accommodations are based on the functional impact of the disability in a major life activity.

Students are able to open a DS file at any time during the academic year. To open a file, students are responsible to meet with DS staff and provide current documentation of their disability. Consultation meetings are encouraged.

The Disability Services department is open from 8 a.m. to 5 p.m. during the academic year and 7:30 a.m. to 4 p.m. during the summer. Students can schedule appointments at their convenience by calling 231-8463. Referrals are made for tutoring, assistive technology orientation, academic, career and personal counseling, disability testing, and other appropriate support.

Dining Services (http://dining.ndsu.nodak.edu)Dining rooms have warm atmosphere and are conducive to socializing. The staff is energetic, caring, and their sincere intent is to make living and dining pleasant and to provide students with a variety of food products and services.

Dining facilities for the majority of students residing on campus are interconnected to adjacent residence halls. Students living near the center of the campus will find food facilities easily accessible within the Memorial Union. The noon meal is the last meal served prior to the beginning of all holidays or recess periods.

Carryout meals will be prepared for students unable to eat at regular times due to class conflicts. A validated meal card or cash is required when entering dining areas offering board meal plans. To make residence hall dining more desirable, minimum standards of dress are required. Shoes and shirts must be worn at all times.

Have a guest? All meal plans include 10 guest passes each semester. Guests also may enter the dining center by using Dining Dollars, Bison Bucks or cash.

Three meal plans are available: 20 meals, 15 meals or 10 meals, with all you care to eat at every meal. Meal plan weeks begin with Monday breakfast and conclude with Sunday dinner. Programs entitle students to one meal per meal period. See Student Financial Information section for board rates.

To accommodate busy schedules, each meal plan includes $75 Dining Dollars. This flexible spending account can be used in any NDSU Dining Services location. Use Dining Dollars for between meals, missed meals, or late night dining.

Note: Meal Plans are nontransferable.

Meal Plan for Students Living Off Campus

The 15-Pack Commuter Plan:

- The 15-pack commuter plan is great for flexibility. Meals are purchased in 15 meal increments. Older than average, graduate, sorority and fraternity members, or students living off campus preferring not to cook every meal at home will enjoy this convenience. This plan is available at all dining locations.

Features of the 15-Pack Commuter Plan
- Flexibility: Meals may be used anytime during the academic year of purchase and do not have to be used within a given meal period or week.
- Guest Meals: Card holders may use any of their guest passes to cover the cost of a meal for a guest.
- Special Notes: Unused meals are not refundable.

Memorial Union (www.ndsu.edu/memorial_union)The Memorial Union serves as a center of social, recreational, educational, and cultural activity for the NDSU campus community. Lounges and meeting rooms provide places where students, staff, faculty, and guests come together to exchange ideas and information and interact informally, thereby adding to their educational experience in a way not available in the classroom. The Memorial Union program includes an art gallery, several permanent art collections, a full season of performing arts events, outdoor adventure trips, bowling and billiards, a series of non-credit short courses in special interest and skill building topics, a community service program, a leadership and recognition program, and a wide variety of events planned by the student program board, Campus Attractions.

Memorial Union staff members assist students with the development of their leadership and management skills through leadership training, workshops, and conferences, as well as involvement in student organizations, campus activities, community service projects, student government and university governance committees.

Services available in the Union include information services, bookstore, the Herd Shop, dining services, barbershop, poster and sign making, graphic services, video bulletin board, room and contact table rental, outdoor recreation equipment rental, ticket office, notary public, photocopying, check cashing, FAX service, and automatic teller banking services.

The Memorial Union was constructed and is operated with the use of non-appropriated funds. An advisory board comprised of students, faculty, staff, and alumni members serves in an advisory role in formation of policies and procedures. In addition to use by students, the Union is available for faculty and departmental meetings, and for professional conventions and conferences. Additional information regarding Memorial Union facilities, services, and policies is available at the Memorial Union administrative offices.

Residence Life (www.ndsu.edu/reslife)The Department of Residence Life supports students by providing a vibrant, healthy place to live and learn. NDSU student living facilities and dining services are designed to extend the student’s educational experience beyond the classroom.

Residence HallsThe residence halls are an integral part of the college experience. In this environment students have opportunities to enhance their academic, social, and personal growth. Also, students who live on campus have been found to be more likely to persist in their education and earn higher grade-point averages than their off-campus peers. For these reasons, all first-year students are required to live on campus. See www.ndsu.edu/reslife for more information. NDSU has 14 residence halls that accommodate approximately 3,000 students.

Residence hall programs. Through the leadership of full-time residence hall directors and resident assistants, students are encouraged to get involved and enjoy a variety of educational, cultural, social, and recreational activities. Opportunities available to students include: Residence Hall Association, Hall Government, Freshman Year Experience, Faculty in Residence, Academic Initiative Communities, and many others.
Apartments
Students who are 20-years-of-age or older or have completed two semesters of post-secondary education are eligible to live in University Village or Bison Court. These apartment communities have a blend of single, married, undergraduate, and graduate students from a variety of countries around the world. Apartment options include: studio, one-bedroom and two-bedroom floor plans. A unique license contract allows students, if they want roommates, to self-select them.

Housing Application
Students who want to apply for campus housing should contact the Department of Residence Life. Residence hall and apartment contracts may also be downloaded from www.ndsu.edu/reslife. Assignment priority is established according to the date that the completed contract and application fee are received. The demand for on-campus housing often exceeds available space, so students are encouraged to apply early. Special consideration may be given to the needs of students with a physical or health condition.

Contracts for residence hall accommodations are for the academic year. For current rates or further information, contact the Department of Residence Life, North Dakota State University, P.O. Box 5481, Fargo, ND 58105-5481.

Student Activities
(http://mu.ndsu.edu/student_activities_office)
Participation in student activities is encouraged at NDSU because of the contribution it makes to the total educational experience of the student. Research has shown that involved students balance their courses while enjoying a greater level of satisfaction during their college years. All student organizations and involvement opportunities are listed on the Memorial Union Web site or in the 120 Memorial Union.

The Student Activities Office is home to many popular involvement opportunities such as the Volunteer Network, Greek Life, the Gallery, and the ever-growing leadership development program series. It can help build your leadership skills, resume, and so much more.

Student Government and Organizations
Student participation in university affairs is coordinated by Student Government. The executive branch is represented by a president and vice president, a commissioner of student organizations, a commissioner of government relations, a commissioner of finance, a commissioner of public relations, a commissioner of academic and student affairs, and an administrative assistant. The Student Senate and the Student Court comprise the legislative and judicial branches. This government coordinates student-faculty committee appointments, and officially recognizes about 200 student organizations in various categories: academic, governing and advisory, Greek, honorary, intercultural, leisure learning, military, performing and visual arts, recreational/competitive, religious, service, special interest, and spirit. Student government also maintains a relationship with councils of independently governed groups (Residence Hall Association, Interfraternity Council, Panhellenic Council, and the Family Student Association). Student senators also serve on University Senate committees. Other students are appointed by the student body president to joint administrative committees. Official recognition is granted to student organizations upon university acceptance of a recommendation from the Student Senate. Student organizational campus activities are financed by a student activity fee, which is administered primarily through the Student Finance Commission. Additional information may be obtained through the Student Activities Office, 120 Memorial Union.

Fraternities and Sororities
(http://mu.ndsu.edu/greek_life)
Fraternities and sororities, often called Greeks because of the use of Greek letters in their organizational names, contribute to the educational process at NDSU. Greeks encourage participation by members in academic, community service, leadership, and social-oriented activities on campus and in the community. Fraternity and sorority membership provides opportunities for individuals to develop their leadership, communication, conflict resolution, organization, collaboration, and management skills that contribute to one's educational and career plans. In addition, Greek membership fosters an environment for developing life-long friendships. Some fraternities and sororities are geared toward individuals with specific academic interests to promote professional competency and achievement within their specific fields. Additional information about fraternities and sororities can be found in the Student Activities Office, 120 Memorial Union.

Fraternities
Alpha Gamma Rho (agriculture)
Alpha Tau Omega
Delta Upsilon
FarmHouse
Gamma Alpha Epsilon
Sigma Chi
Sigma Nu
Sigma Phi Delta (engineering and architecture)
Tau Kappa Epsilon
 Theta Chi
Sororities
Alpha Gamma Delta
Beta Sigma (agriculture interest)
Kappa Alpha Theta
Kappa Delta
Co-ed Professional
Kappa Psi (pharmacy)

Honor Societies
Several honor societies are well established at NDSU and encourage superior scholarship in various special fields:

Alpha Epsilon (agricultural engineering)
Beta Gamma Sigma (business)
Blue Key (student leadership and service)
Gamma Sigma Delta (agriculture)
Golden Key (student leadership, service, and scholarship)
Lambda Pi Eta (communication)
Libra (sophomore scholarship)
Mortar Board (student leadership and service)
National Residence Hall Honorary (leadership in residence halls)
Order of Omega (Greek leadership and service)
Phi Alpha Theta (history)
Phi Eta Sigma (freshman scholarship)
Phi Kappa Phi (all academic fields)
Phi Sigma (biology)
Phi Upsilon Omicron (human development and education)
Pi Kappa Delta (forensics)
Pi Sigma Alpha (political science)
Pi Tau Sigma (mechanical engineering)
Psi Chi (psychology)
Rho Chi (pharmacy)
Phi Lambda (leadership in social sororities)
Sigma Theta Tau (nursing)
Tau Beta Pi (engineering)
Tau Sigma Delta (architecture)
Tri-College Hugh O’Brien Leadership Club (public service and leadership)
Upsilon Pi Epsilon (computer science)

Athletics
(www.GoBison.com)
NDSU’s athletics program is a Division I member of the National Collegiate Athletic Association. The football program competes in the Football Championship Subdivision’s Gateway Football Conference, which is comprised of Illinois State University, Indiana State University, Missouri State University, North Dakota State University, University of Northern Iowa, South Dakota State University, Southern Illinois University, Western Illinois University, and Youngstown State University. The wrestling program competes in the Western Wrestling Conference, while all other sports compete in The Summit League, which includes Centenary College of Louisiana, Indiana University-Purdue University Fort Wayne, Indiana University-Purdue University Indianapolis, University of Missouri-Kansas City, North Dakota State University, Oakland University, Oral Roberts University, South Dakota State University, Southern Utah University and Western Illinois University.

In addition to football, varsity competition for men includes baseball, basketball, cross country, golf, indoor track and field, outdoor track and field and wrestling.

Opportunities for women’s varsity competition include basketball, cross country, golf, indoor track and field, outdoor track and field, soccer, softball and volleyball.

Excellence is a goal of the university and athletics is no exception. As a Division I athletic program, its vision, “Continuing the Championship Tradition of Bison Athletics” prevails as the cornerstone of its future.

NDSU Bookstore
(www.ndsubookstore.com)
The NDSU Bookstore, owned and operated by NDSU, is located at the south entrance of the Memorial Union. The NDSU Bookstore is the official source of all required textbooks, supplies, apparel, and gifts for students, faculty, staff, and the general public. NDSU’s convenience store, the Herd Shop, stocks such items as snacks, beverages, health and beauty aids and more. The computer department carries educationally priced hardware and software for students, faculty, and staff. In addition, the NDSU Bookstore sells stamps, phone cards, gift cards, and graduation attire.
1. A student must be enrolled in at least one degree credit course at NDSU before enrollment guidelines pertain to courses taken collaboratively. The student is earning a degree is considered the “home institution.” The institution(s) from 9 a.m. to 5 p.m. and Friday from 9 a.m. to 1:30 p.m. may expect to pay tuition and fees on a per credit basis at rates comparable to North Dakota resident tuition and fee rates. Courses offered through Distance and Continuing Education generally count toward credit totals for financial aid but do not count toward the NDSU tuition cap. In cases where delivery costs are higher, or for specialized programs, fees may be higher. Both non-degree credit and non-credit activity course fees vary widely. Distance and Continuing Education reserves the right to adjust course fees as needed without prior notice.

2. The collaborative process allows NDSU to combine credit from more than one NDUS institution for the purpose of financial aid (for courses added through the seventh business day from the start of the term).

3. The student pays provider campus tuition/fees for collaborative course(s). This additional amount is included in the student’s accounts receivable balance at NDSU.

4. Collaborative courses are not subject to the NDSU tuition cap.

5. The student cannot exceed a total of 20 credits between NDSU and the provider institution(s) without special permission from the Registrar at both (all) campuses.

6. The student must follow NDUS’s academic dates and deadlines for adding/dropping collaborative courses.

7. Drop/adds must be administered through the collaborative contact at NDSU, 110 Ceres Hall.

8. Courses will be posted as transfer credit once NDSU receives an official transcript from the provider institution. Note: grades earned in collaborative courses may be used in determining financial aid satisfactory progress.

9. Completion of the Collaborative Student Contract and Registration Form does not guarantee registration into the requested course(s). However, if the request(s) cannot be processed, you will be notified at the e-mail address or phone number you provide.

Distance and Continuing Education (www.ndsu.edu/DCE)
Distance and Continuing Education is an outreach unit of the university that makes the resources of the institution available in a variety of traditional and non-traditional ways, including distance learning educational opportunities. Courses, locations, and delivery systems are planned in response to requests and identified needs. Distance and Continuing Education activities fall into three main programming categories: degree credit, non-degree credit (professional development), and non-credit.

Degree Credit
Distance and Continuing Education offers regular credit courses on-campus, off-campus, and via distance formats, as a supplement to the work of academic departments. Students wishing to take degree credit courses through Distance and Continuing Education must be admitted to the university. Interested individuals must complete application procedures through the NDSU Office of Admission or The Graduate School at NDSU.

Non-Degree Credit
Distance and Continuing Education also offers credit courses on-campus, off-campus, and via distance formats that are not applicable for degree programs. These are typically referred to as professional development courses and are numbered 600. Students need not be admitted to the institution to enroll in non-degree credit courses.

Non-Credit
Distance and Continuing Education offers a wide array of workshops, conferences, and in-service activities, which may occur for an hour or a day or be intermittent and distributed over several months. These activities provide individuals or organizations with learning opportunities in specialized training, personal development, job skill enhancement, meeting Continuing Education Unit (CEU) requirements, and general interests. Students do not have to be admitted to NDSU to enroll in non-credit courses.

Distance and Technology-Enhanced Learning
Distance and Continuing Education uses a wide range of distance delivery systems for all types of activities including satellite, the North Dakota Interactive Video Network (ND IVN), the Web, Internet, video- and print-based correspondence, videoconferencing, and combinations thereof. These distance delivery technologies bridge geographic limitations and allow students to complete work on their own any time, any place.

Continuing Education Fees
Students enrolled in degree credit courses administered through Distance and Continuing Education may expect to pay tuition and fees on a per credit basis at rates comparable to North Dakota resident tuition and fee rates. Courses offered through Distance and Continuing Education generally count toward credit totals for financial aid but do not count toward the NDSU tuition cap. In cases where delivery costs are higher, or for specialized programs, fees may be higher. Both non-degree credit and non-credit activity course fees vary widely. Distance and Continuing Education reserves the right to adjust course fees as needed without prior notice.

For more information, contact Distance and Continuing Education, 1919 North University Drive, Fargo, phone 701-231-7015 or 1-800-726-1724, fax 701-231-7016, or online at www.ndsu.edu/dce.
**International Program Services**

(www.ndsu.edu/International)

As part of the Division of Academic Affairs, the Office of International Programs provides leadership and support services for all aspects of international education. Students and scholars from other countries are welcome at NDSU. The Office of International Programs provides services to assist international students and scholars prior to and after arrival at the university. These services include preparation for arrival, airport pickup, orientation, advising on personal matters, and assistance with immigration legal compliance. Additional information is provided to international students and scholars through newsletters and informational seminars. Students from the U.S. and other countries may receive assistance with planning experiences abroad in the Office of International Programs. Information is provided to students through group seminars and individual advising. International student ID cards, country and program brochures, and travel related information are available to all students. International activities also are coordinated through the Office of International Programs. The main event each year is International Week, which highlights the advantages of learning about world cultures through displays, lectures, film, International meal, and cultural shows. Students may participate in activities off campus, such as the Tri-College Community Welcome Picnic, Public Schools’ Speakers Programs, and a variety of local cultural events. Information on all matters pertaining to international students and scholars as well as prospective study abroad students is available online, in 116 Memorial Union, or by calling 231-7895. See Admission of International Students section for admission information.

**Global Studies**

The Office of International Programs (OIP) facilitates international educational opportunities for students, staff, and faculty. Exchange agreements are coordinated between NDSU and foreign universities offering opportunities for international study, teaching, or research for the campus community.

**Study Abroad**

(www.ndsu.edu/International)

Experience abroad can provide an invaluable education for students. Studying, working, interning, or traveling abroad offers many benefits, such as increasing cultural awareness, improving language skills, and developing in-depth knowledge in a particular field from an international perspective. International experience also offers career advantages because employers increasingly seek to hire individuals who have multinational and multicultural perspectives and experience.

NDSU currently has exchange programs with universities in Australia, Brazil, Chile, Cyprus, Denmark, England, France, Germany, Italy, Korea, Mexico, the Netherlands, Norway, Spain, and Sweden, and is continuing to develop exchange programs in additional countries. Students can choose from semester-long programs as well as academic-year and summer programs. In addition, short-term options exist, including study tours during Spring Break and summer. NDSU is also a member of the International Student Exchange Program (ISEP), which offers programs in more than 100 sites throughout the world, including Africa, Asia, Australia, Canada, Europe, and Latin America. Students pay NDSU tuition and fees while studying abroad on an NDSU exchange or ISEP exchange.

Students also may take advantage of numerous programs offered through affiliated study abroad providers, national organizations, consortia, and other universities. Students are typically able to retain their normal financial aid package and are responsible for the costs of airfare and travel, housing, and other living expenses abroad. Information about current study abroad opportunities is available online, in the Office of International Programs, 116 Memorial Union, by calling 231-7895, or by e-mail at ndsu.international@ndsu.edu.

**Multicultural Student Services**

(www.ndsu.edu/multicultural)

The Department of Multicultural Student Services assists students, faculty, and staff in creating a culturally diverse and sensitive campus at NDSU. MSS works with prospective and enrolled students by providing student support programs, cultural and personal growth experiences, and serving as an advocate for minority issues on campus. NDSU enrolls more than 550 students who identify as minorities, including African American, American Indian, Asian/Pacific Islander, and Hispanic/Latino.

**Native American Pharmacy Program**

(www.ndsu.edu/pharmacy/napp)

A special program at NDSU is designed to recruit, retain and support Native Americans who have an interest in entering the pharmacy field. Monthly meetings and support services are provided. Additional information is available by calling 231-7602.

**Orientation and Student Success**

(http://oss.ndsu.edu)

The Office of Orientation and Student Success works to help new and returning students experience success through academic and personal growth. Orientation and Student Success staff provide New Student Orientation programs for freshman and transfer students and their families. Staff members also coordinate academic tutoring (ACE) and peer advising/mentor programs in collaboration with academic colleges and offices throughout the university.

Orientation and Student Success also strives to educate students and parents about risks associated with alcohol use, communicate clear messages about the consequences of underage drinking, and provide on-campus late-night activities. In addition, staff conduct retention-related research, develop services focusing on at-risk students, and provide support for the Skills for Academic Success course.

**Project 65**

People aged 65 or over may audit one course per semester free of tuition and related fees, with the exception of a one-time $35 application fee.

Project 65 students are encouraged to purchase the textbooks for their courses. The transcript of a student auditing a course will show a grade of “Audit” for the course, which will not count as credit toward a degree. By definition, an auditor may attend class only as a listener. Students wishing to earn credit toward a degree must pay all tuition and fees and complete all assignments and tests.

Students should identify themselves as participants in the Project 65 program at the time of registration. For more information, contact the Office of Registration and Records, 110 Ceres (231-7981).

**Reserve Officers Training Corps (ROTC) Program**

**Army ROTC**

(www.ndsu.edu/armyrotc)

The Army Reserve Officers’ Training Corps program at NDSU is voluntary and open to both male and female students. Activities are conducted through the Department of Military Science.

The first two years of the regular four-year course of Army ROTC at NDSU are designated as the Basic Course; ROTC non-scholarship students participating in the Basic Course incur no military obligation or commitment. The last two years of Army ROTC are designated as the Advanced Course. Qualified students may apply for acceptance in the Advanced Course with a commission as Second Lieutenant in the United States Army, Army National Guard, or Army Reserve as the objective. The Army ROTC program also offers commissions in the Army National Guard or Reserves.

To be eligible for consideration and admission to the Advanced Course, a student must be (1) a citizen of the United States, (2) of good moral character, (3) have completed either the Basic Course or the six-week basic training period or have received credit in lieu thereof, (4) have successfully completed the prescribed physical examinations and (5) in general, able to complete all requirements for a commission. See the Military Science (Army ROTC) office in Benton Bunker Fieldhouse for additional details.

Students selected for admission to the Advanced Course are required to sign a written contract to fulfill certain conditions required by law and regulations. Military uniforms, Military Science textbooks, and military equipment are furnished without charge to all contracted ROTC students. Advanced Course students receive a tax-free government subsistence of approximately $4,000 each academic year they are enrolled in the Advanced ROTC program. Students are required to attend, and are paid for, a five-week summer training period.

ROTC two-, three-, and four-year scholarships may be awarded to students who meet established criteria. Each scholarship provides for tuition, fees, and $1,200 toward the purchase of textbooks and supplies in addition to the approximately $4,000 subsistence for each academic year that the scholarship is in effect.

For a description of Army and Air Force ROTC courses, see the departmental course listings under Military Science.

**Air Force ROTC**

(www.ndsu.edu/afrotc)

Air Force ROTC is an educational and training program designed to give men and women the opportunity to become Air Force officers while completing an undergraduate or graduate degree. The program prepares students to assume positions of increasing responsibility and importance in today’s modern Air Force.

The General Military Course (GMC) Program: GMC is the first half of the four-year program and is taken during the freshman and sophomore years. During this period, non-contracted students are able to try-out the program without any obligation. Students enrolled in the program will learn about the foundations of the Air Force and the historic development of air power.
The Professional Officers Course (POC) Program: POC is available to juniors and seniors who have been selected from GMC cadets or a limited number of juniors who have two years of college remaining and want to join the program. The POC covers leadership skills, and national defense policy to prepare cadets for active duty. Field Training. Field Training is military training conducted at select Air Force bases during the summer, usually between the sophomore and junior years. Training includes physical conditioning, marksmanship training, survival training, Air Force Special Orientation, leadership study, and more.

Qualifications: 1) Pass the Air Force Officer Qualification Test (AFOQT), 2) Be a U.S. Citizen, 3) Be a full-time student at a school offering AFROTC, 4) Be physically/medically qualified, 5) Complete all commissioning requirements

Benefits: AFROTC textbooks and uniforms are provided. Opportunities such as Air Force base visits, jet orientation flights, summer travel, and other experiences also are available.

Career Opportunities: The Air Force offers a wide range of challenging career opportunities such as pilot, navigator, space and missiles, nursing, engineering, scientific research, computers and communications, intelligence, and law enforcement.

Air Force Scholarships: Air Force ROTC has two general types of merit-based scholarship programs: High School and In-College. To qualify, students must meet all requirements. Scholarship winners receive a tax-free monthly stipend ranging from $300-$500, as well as a textbook allowance of $900 per year. College students may apply for In-College scholarships after their first semester in the program. Scholarships are for one, two, or three years and pay from $3,000 per year to full tuition.

For further information on the AFROTC program, see the department course listings under Aerospace Studies or contact Air Force ROTC at (701) 231-8186, or via email: ndsu.afrotc@ndsu.edu.

Summer Session
The 12-week summer session is designed to provide coursework within various time intervals. The standard four-week session begins in May; the standard eight-week session begins in June. There also are variations within these sessions, including a full 12-week term, to provide for maximum flexibility to summer students.

Each college determines its summer offerings, based upon previous experience, programmatic needs, and special requests. Special effort is made to offer courses approved for fulfilling general education requirements. The summer session course offerings schedule is available online at www.ndsu.edu/registration or from the Office of Registration and Records, 110 Ceres. For information on summer school, please call 231-8492 or 231-6133.

Fees and Housing
Fees are listed at www.ndsu.edu/bisonconnection/accounts. Information concerning summer housing may be secured by contacting the Department of Residence Life, P.O. Box 5481, Fargo, ND 58105, or 231-7557 (toll-free 1-800-572-8840).

Undergraduate Admission Requirements
The course offerings of the summer school are open to all qualified students. Students may enroll as degree candidates by meeting general university requirements as described elsewhere in this bulletin and submitting an application for admission to the Office of Admission. Students attending another institution but wishing to enroll for summer school at the university may apply for special status by submitting a Special Student Application for Admission, a $35 nonrefundable application fee, and an official transcript from their home institution (if coursework was attempted within one year prior to application).

Credit for Courses
While the time interval of the individual sessions is different than that of the normal semester, each course carries full credit because classes meet the same number of hours as in the standard semester.

Graduate Work
A range of opportunities is available for graduate work during the summer session as evidenced by the traditionally high enrollment of graduate students. A considerable number of graduate courses is offered, but generally the summer serves as an important term for students to work on their research requirements, especially if field work is involved. Work on disquisitions and individual study arrangements frequently are facilitated during summers. Courses scheduled to begin at different times and for varying periods provide a high level of flexibility. Thus, those who may have only a portion of a given summer available are likely to find courses that meet their scheduling limitations. In addition, workshops, internships, and other special programs are offered. Teachers generally find the summer school designed to offer attractive selections as components of a degree program, as well as courses directed toward improvement of professional skills. Persons interested in graduate programs are urged to contact The Graduate School for further information.

Tri-College University
Tri-College University (TCU) is a consortium of the three major Fargo-Moorhead institutions of higher education: NDSU, Concordia College, and Minnesota State University Moorhead. Students at the three schools may benefit from what each school offers individually and cooperatively through the consortium.

Through the Tri-College course exchange, students enrolled at one campus may take courses at the other two at no extra cost and without going through separate admission procedures. Tri-College expands discipline offerings and course availability for students beyond their home campus. Tuition is paid only to the home-base campus. Courses not eligible for Tri-College registration are those offered through NDSU’s Division of Distance and Continuing Education, summer self-support, off-campus or weekend courses offered through MSUM’s Continuing Education program, most workshops, most graduate courses, independent study courses at Concordia College, private music instruction at Concordia, and international travel programs.

Students enrolling in classes that require special fees (lab fees, lessons, supplies, etc.) beyond the home-campus fees assessed at the time of registration will be responsible for remittance of payment to the billing department or institution.

Course limits: Concordia students — and MSUM or NDSU students wanting to take a course at Concordia — may take only one course per term under the student course exchange, and then, only if they are full-time students and only if that course is not available on their home campus at any time during the academic year. Concordia does not participate in the TCU course exchange during the summer. NDSU students wishing to enroll in MSUM coursework are expected to maintain enrollment (at least one course) at NDSU each semester. Concordia and MSUM business courses taken via Tri-College may not be applied to professional programs (majors and minors) in the College of Business at NDSU.

Credits and Grades: Credits earned through TCU course exchange will appear on a student’s transcript and be applied toward graduation requirements and grade point averages as though they were taken at their home-campus.

Course substitutions: Students need to obtain advanced approval to substitute TCU courses for required courses in a major or minor.

Drop/add deadlines: Students follow their home-campus deadlines to drop or add a course, or to enroll as pass/fail, instead of at the TCU partner school where the course is offered or hosted.

Registration and payment procedures: Students register for TCU exchange courses at their home campus and pay their home campus tuition and fees. (NDSU students register in person in the Office of Registration and Records, 110 Ceres Hall.)

Tri-College Minors
The Tri-College partners recognize minors earned through the TCU course exchange. Students receive recognition on their graduation transcripts for minors completed on one of the other TCU campuses. This policy applies only to minors earned in programs not available on a student’s home-campus.

 Majors
Majors may be earned only at the school from which a student earns a degree. Most students enroll initially at the school from which they intend to graduate. However, the TCU course exchange agreement between MSUM and NDSU allows a student to begin their studies at one of the schools prior to transferring to the other school to complete their degree. Select programs have specially-designed articulation agreements intended to provide a seamless transfer process for TCU students. Tri-college students typically are restricted to pre-professional coursework in a professional program of study. Students should work with the chair of the department in which they intend to major to make sure their program includes all requirements for the major and for graduation. Students may apply for tuition reciprocity prior to transferring from their home state. In addition, a Tri-College graduate program exists in Educational Leadership.

Library Services
Students, faculty, and staff of the TCU institutions may use all of the libraries in the consortia. Circulating materials from TCU libraries are available free of charge for direct checkout or through interlibrary loan via daily shuttle service. A regional computer-based catalog shows availability of materials at the TCU
libraries as well as more than 100 other libraries. In addition, a cooperative video collection maintained at MSUM makes videos available for onsite viewing and checkout. For details, contact a TCU library.

Bus and Parking Services
A Tri-College bus schedule provides intercampus transportation to Concordia, MSUM, and NDSU every half hour. The bus is operated weekdays by the City of Fargo during the NDSU/MSUM academic year; it is not available during the summer. Bus schedules are available at the TCU office and at several locations on each campus.

A separate parking permit is not issued for Tri-College University parking. If vehicles have a current home-campus permit, they may be parked in the following lots on other campuses.

**Concordia:** TCU students, faculty, and staff can park in Parking Lot MH/C. Parking restrictions are strictly enforced.

**MSUM:** TCU students can park in Lots ED, P and K. TCU faculty and staff may park in Lots ED, P, K, and F.

**NDSU:** TCU students can park in T or R Lot. TCU faculty and staff permits are valid for T-I Lot.

All drivers are subject to traffic regulations of the respective institutions. Lot restrictions are eased after 5 p.m., but there is no overnight parking.

**TRIO Programs (www.ndsu.edu/trio)**
Child Care Access Means Parents In School, McNair Scholars Program, Student Support Services, Upward Bound, and Veterans Upward Bound are funded by the U.S. Department of Education and administered by the Division of Student Affairs and the Office of TRIO Programs, 319 Ceres Hall (231-8028).

**Child Care Access Means Parents In School**
Child Care Access Means Parents In School (CCAMPIS) assists income-eligible student parents with child care expenses, thereby providing student parents with financial support so they can stay in school and complete their degrees. Graduating parents will serve as a positive role model for their children and for future generations. Students attending at least six credits per semester and receiving a Pell grant are eligible to apply to CCAMPIS. Funding for CCAMPIS is provided through a $64,000 per year grant from the U.S. Department of Education.

**McNair Scholars Program**
The McNair Scholars Program (MSP) increases the number of professors and doctorally prepared graduates from traditionally underrepresented populations. The program provides eligible juniors and seniors with a stipend, counseling, academic enrichment, preparation for graduate school entrance examinations, and opportunities for research under the guidance of university professors. The principle purpose of the program is to increase the rate of graduate enrollment, completion of the doctorate, and attainment of professorial positions for low income, first generation, and underrepresented college students. Funding for the McNair Scholars Program is provided through a $242,207 per year grant from the U.S. Department of Education.

**Student Support Services**
The Student Support Services (SSS) project provides tutoring, small group instruction, and support services to university students who meet eligibility requirements and are in need of assistance. The instruction and tutoring services are offered on an individualized basis in mathematics, science, English, reading, assistive technology, computer literacy, and study skills as well as some specialized course areas. The purpose is to maximize students’ chances of success in their university coursework. Freshman and sophomore Pell grant recipients that have unmet need in their financial aid package may be eligible for additional grant aid while participating in Student Support Services. Funding for Student Support Services is provided through a $402,621 grant from the U.S. Department of Education.

**Upward Bound**
The Upward Bound (UB) project serves high school students who want to get a college degree. To qualify, students must be in the target area and be income eligible or a potential first generation college student. In the summer, students attend a six-week camp on the NDSU campus that includes instruction and tutoring in math, science, English, Spanish, computer technology, and study skills. During the academic year, students regularly visit campus for academic instruction, career and college preparation along with fun, cultural activities. The project also provides tutoring and other individualized academic assistance at their respective high schools. Graduating seniors, called “bridge students,” take an entry level college class at the NDSU campus before moving on to the college of their choice. Students receive cost free services as well as receiving a monthly stipend for participation. Funding for Upward Bound comes from a $234,624 grant from the U.S. Department of Education.

**Veterans Upward Bound**
The Veterans Upward Bound (VUB) project provides individualized education opportunities for veterans who want to obtain academic preparation before entering or during postsecondary education. Coursework in English, computer literacy, mathematics, science, and reading is designed to prepare veterans for successful participation in postsecondary education. The program also offers General Education Development (GED) test preparation for veterans lacking a high school diploma. In addition to academic coursework, the project provides advising and referral services. Veterans may be eligible to receive educational benefits while attending VUB. Funding for the program is provided through a $265,319 grant from the U.S. Department of Education.

**University Honors (Scholars) Program**
The University Honors Program is an interdisciplinary program designed for students of exceptional ability whose interests range well beyond their primary majors. The program consists of a series of interdisciplinary colloquia. These are limited to 20 students and, in the second year, are taught by teams of two or more faculty members. Graduation from the Honors Program requires 18 hours of honors courses and a senior project.

**First-Year (6 credits)**
- English 121 Honors Composition II
- HON 199 Honors Inquiry
- Literature and Ideas: an interdisciplinary investigation of conflicting values

**Second-Year (6 credits)**
- An interdisciplinary course each semester
- Offerings vary; exploration of topics such as the perspective of world literature on the human condition, problems of world hunger, the diverse ways of understanding nature, ethical issues in the sciences, the perspectives of the world press

**Third-Year (6 credits)**
- Fall semester: an interdisciplinary colloquium
- Spring semester: student/faculty led discussions on texts chosen by the student participants

**Fourth-Year (4 credits)**
- Senior Project
- Independent, faculty-guided reading and research leading to a completion of the Senior Honors Project

For admission to the program, contact: University Honors Program, College of Arts, Humanities and Social Sciences, Minard Hall.

**ACADEMIC INFORMATION AND REGULATIONS**

Degrees at both the undergraduate and graduate levels are offered at NDSU. For more information about the various programs of study leading toward baccalaureate degrees, consult the college sections of this bulletin. Graduate degree requirements and fields of study are summarized in the College of Graduate and Interdisciplinary Studies section of this bulletin. For more complete details, see The Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

**Undergraduate Areas of Study**
Coursework is available in the areas listed by major within each college according to the categories indicated. Consult the index for page numbers.

**Key:**
- M Undergraduate/Baccalaureate major
- T Teacher certification available
- Undergraduate minor
- Undergraduate Certificate program

**College of Agriculture, Food Systems, and Natural Resources**
- M,m Agribusiness
- M Agricultural Economics
- M,m Agricultural Systems Management
  - Agribusiness
  - Production Agriculture
  - Dealership Management
  - Production Agriculture
  - Animal Health Management
- M,m Animal Science
  - Production/Business
  - Science
Academic Information and Regulations

M,m Biotechnology
M,m Crop and Weed Sciences
  o Biotechnology
  o Production
  o Science
  o Weed Science
M,m Economics
M,m, c Equine Studies
M,m Food Safety
M Food Science
M,m General Agriculture
M,m Horticulture
  o Horticulture Biotechnology
  o Horticulture Science
  o Landscape Design
  o Production Business
  o Urban Forestry and Parks
m Large Animal Veterinary Technology
M,m Microbiology
  o Pre-Veterinary Medicine
M,m Natural Resources Management
  o Biotic Resources
  o Environmental Communication
  o Natural Resources Economics
  o Physical/Earth Resources Sciences
  o Pollution Science
  o Social Sciences
M,m Range Science
M,m Soil Science
M Sports and Urban Turfgrass Management
M Veterinary Technology
  Pre-Veterinary Medicine

College of Arts, Humanities and Social Sciences

M,m Agricultural Communication
M,m Anthropology
M,m Art
M,m Classical Languages
m Community Development
M,m Criminal Justice
M,m Emergency Management
M,m English
M,m French
m French Studies
m German Studies
m Gerontology
M,m Health Communication
M,m History
M,m Humanities
M,m Journalism, Broadcasting and Mass Communication Technologies
M,m Management Communication
M,m Music
M,m Philosophy/Humanities
M,m Political Science
  o Public Service
  o Pre-Law
M Public History
M,m Public Relations and Advertising
m Religious Studies
M Social Science
M,m Sociology
M,m Spanish
m Spanish Studies
M,m Theatre Arts
m Web Design
M,m Women's Studies

College of Business
M Accountancy (five-year)
M,m Accounting (four-year)
agribusiness (Corporate Track)
M,m Business Administration
M,c Finance
m Fraud Investigation
c Human Resource Management
m Logistics Management
M Management
M,m Management Information Systems
M,c Marketing

College of Engineering and Architecture
m Aerospace Studies—Air Force ROTC
M Agricultural and Biosystems Engineering
  Architecture (see Environmental Design)
M Civil Engineering
M Computer Engineering
M Construction Engineering
M Construction Management
M Electrical Engineering
  o Biomedical Engineering
  o Communication and Signal Processing
  o Control Engineering
  o Electromagnetics
  o Electronics and Microelectronics
  o Optical Engineering
  o Power Systems
M Environmental Design (leads to Master of Architecture)
M,m Industrial Engineering and Management
  o Health Care Management
  o Human Factors Engineering
  o Lean Enterprise
  o Manufacturing Systems Design
  o Operations Research
  o Production and Inventory Control
  o Project and Engineering Management
  o Reliability and Quality Assurance
M,m Landscape Architecture
  o Design and Communications
  o Land Reclamation
  o Landscape Construction and Technology
  o Natural Resources Management
  o Rural Community Development
M,m Manufacturing Engineering
  o Computer Integrated Manufacturing
  o Lean Enterprise
  o Production Engineering
  o Manufacturing Systems Design
  o Specialized Manufacturing Processes
M Mechanical Engineering
  o Coatings and Polymeric Materials
m Military Science—Army ROTC
M,m Natural Resources Management
  o See options under College of Agriculture, Food Systems, and Natural Resources

College of Human Development and Education

M,m Apparel and Textiles
  o Apparel Studies
  o Retail Merchandising
M,m Child Development and Family Science
  o Child Development
  o Family Science
m Coaching
M Dietetics
  o Coordinated Program in Dietetics
  o Didactic Program in Dietetics
M Exercise Science
m Gerontology
M,m Hospitality and Tourism Management
m Individual and Family Wellness
M,m Interior Design
M,m Physical Education
  o Community Sports (non-teaching)
M Sport and Recreation Studies
  o Recreation Management
  o Sport Management
M,m Women's Studies

Secondary Education:
M Agricultural Education
M Biological Sciences Education
M Chemistry Education
Academic Information and Regulations

Elementary Education is offered by Valley City State University as a dual degree/major with Child Development and Family Science.

College of Pharmacy, Nursing, and Allied Sciences

College of Science and Mathematics

College of University Studies

Interdisciplinary Undergraduate Programs

Majors and Degrees Available

Degree Programs

Majors and Degrees Available

Degree Programs

Majors and Degrees Available

Degree Programs

Majors and Degrees Available

Degree Programs

Majors and Degrees Available

Degree Programs

Majors and Degrees Available

Degree Programs

Majors and Degrees Available

Degree Programs
English Education B.A., B.S.
Entomology M.S., Ph.D.
Environmental and Conservation Science M.S., Ph.D.
Environmental Design B.S.
Environmental Engineering M.S.
Equine Studies B.S.

Family and Consumer Sciences Education B.S., M.Ed., M.S.
Finance B.S.
Food Safety B.S., M.S., Ph.D.
Food Science B.S.
French B.A., B.S.
French Education B.A., B.S.

Genomics and Bioinformatics M.S., Ph.D.
Geology B.A., B.S.

Health Communication B.A., B.S.
Health Education B.A., B.S.
Health, Nutrition and Exercise Science M.S.
History B.A., B.S., M.A., M.S., Ph.D.
History Education B.A., B.S.
Horticulture B.S., M.S.
Hospitality and Tourism Management B.A., B.S.
Human Development Ph.D.
Human Performance and Fitness B.A., B.S.
Humanities B.A., B.S.

Industrial Engineering and Management B.S., M.S.
Industrial and Manufacturing Engineering Ph.D.
Interior Design B.A., B.S.
International Agribusiness M.S.
International Studies* B.A., B.S.

Journalism, Broadcasting, and Advertising, B.A., B.S.

Landscape Architecture B.L.A.

Management B.S.
Management Communication B.A., B.S.
Management Information Systems B.S.
Manufacturing Engineering B.S., M.S.
Marketing B.S.
Mass Communication M.A., M.S.
Materials and Nanotechnology, Ph.D.
Mathematics B.A., B.S., M.S., Ph.D.
Mathematics Education B.A., B.S.
Mechanical Engineering B.S., M.S., Ph.D.
Merchandising M.S.
Microbiology B.S., M.S.
Molecular Pathogenesis Ph.D.
Music B.A., B.S., B.Mus., M.M., D.M.A.
Music Education-Instrumental B.A., B.S.
Music Education-Vocal B.A., B.S.

Natural Resources Management B.S., M.S., Ph.D.
Nursing B.S.N., M.S.
Nursing Practice D.N.P.

Pharmaceutical Sciences B.S., M.S., Ph.D.
Pharmacy Pharm.D.
Philosophy/Humanities B.A., B.S.
Physical Education B.A., B.S.
Physics B.A., B.S., M.S., Ph.D.
Physics Education B.A., B.S.
Plant Pathology M.S., Ph.D.
Plant Sciences M.S., Ph.D.
Political Science B.A., B.S.
Public History, B.A., B.S.
Public Relations and Advertising, B.A., B.S.
Psychology B.A., B.S., M.S., Ph.D.

Radiologic Sciences B.A., B.S.
Range Science B.S., M.S., Ph.D.
Recreation Management B.A., B.S.
Respiratory Care B.A., B.S.

Social Science B.A., B.S., M.S.
Social Science Education B.A., B.S.
Sociology B.A., B.S., M.S.
Software Engineering M.S., Ph.D.
Soil Science B.S., M.S., Ph.D.
Spanish B.A., B.S.
Spanish Education B.A., B.S.
Speech Communication M.A., M.S.
Sports and Urban Turfgrass Management B.S.
Statistics B.A., B.S., Ph.D.

Theatre Arts B.A., B.F.A., B.S.
Transportation and Logistics M.M.L., Ph.D.

University Studies B.U.S.

Veterinary Technology B.S.

Women’s Studies B.A., B.S.

Zooology B.A., B.S., M.S., Ph.D.

P
Pharmaceutical Sciences B.S., M.S., Ph.D.
Pharmacy Pharm.D.

S
Social Science B.A., B.S., M.S.
Social Science Education B.A., B.S.
Sociology B.A., B.S., M.S.

R
Radiologic Sciences B.A., B.S.
Range Science B.S., M.S., Ph.D.
Recreation Management B.A., B.S.
Respiratory Care B.A., B.S.

T
Theatre Arts B.A., B.F.A., B.S.
Transportation and Logistics M.M.L., Ph.D.

U
University Studies B.U.S.

V
Veterinary Technology B.S.

W
Women’s Studies B.A., B.S.

Z
Zooology B.A., B.S., M.S., Ph.D.

1 B.A. degree with this major only available through the College of Science and Mathematics.
2 Offered only when taken concurrently with another major.

General Education Program
The purpose of general education at NDSU is to ensure that students acquire knowledge, perspectives, and skills basic to a university education. The program is designed so that graduates will be able to adapt to and anticipate changes in their profession and in society. Graduates also will be able to integrate and use the knowledge and perspectives they have gained to live productive, intellectually rewarding and meaningful lives.

Intended Student Outcomes
The intended student outcomes resulting from general education include the following abilities:
1. Communicate effectively in a variety of contexts and formats.
2. Locate and use information for making appropriate personal and professional decisions.
General Education Program Assessment

General education assessment has three basic purposes:
1. To improve student learning and development by identifying the intended student outcomes for the program.
2. To provide feedback on the progress toward the intended student outcomes.
3. To use the feedback to modify aspects of the program to ensure that the outcomes are achieved and that student learning is improved.

Assessment activities are valued at NDSU and include the participation of students. Results will not be used to penalize students or faculty. Student performance on assessment of the general education program will not become part of the transcript.

General Education Administrative Policies

1. General education courses may be used to satisfy requirements for both general education requirements and the major, minor, and program emphases, where applicable.
2. Departments or colleges may preclude their students from double counting general education courses.
3. Department or college requirements for graduation may exceed the minimum general education requirements.
4. Except for courses that meet the cultural diversity or global perspectives requirements, no course can fulfill the requirements for more than one general education category.
5. General education requirements can be met through the College Level Examination Program (CLEP), DANTES, International Baccalaureate (IB), departmental examinations, the Advanced Placement program (AP) of the College Entrance Examination Board, or equivalents.
6. General education requirements can be met by successful completion of a course for which an approved general education course in the same department is a prerequisite or by successful completion of an advanced course in the same department with comparable course content.
7. No general education course may be taken for graduate credit.
8. Except for courses offered only on a pass/fail basis, no courses taken to meet the general education requirements may be taken for pass/fail grades.
9. The general education minimum requirements apply to all undergraduate degree programs as well as the professional degree program in pharmacy.
10. Transfer students meet NDSU’s general education “College Composition I and/or College Composition II” requirement in the lower-division Communication category if they have credit in any English course (in composition, composition and literature, or the equivalent) totaling at least 2.67 semester credits per course. Transfer students who have only partial or no general education category requirements by transfer-approved courses must complete the requirements in approved courses within the NDSU deficient categories.
   No category credit requirement may be deficient by more than a partial semester credit. However, in the communication category, if the transfer course(s) have been evaluated as equivalent to ENGL 110, 120, and COMM 110 and total no less than eight semester credits, the lower-division category requirement has been met. The total for all general education categories must be at least 39/40 semester credits for new students.
11. Students may receive placement credit for ENGL 110 based on composite ACT score and satisfactory performance in ENGL 120 or equivalent.
12. A student who has completed a general education program consisting of a minimum of 36 semester credits at a regionally accredited institution and who transfers to NDSU or who pursues a second baccalaureate degree at NDSU is considered to have completed his or her lower-division general education requirements at NDSU.
13. General education courses at other accredited institutions, which do not have equivalent courses or general education status at NDSU, may be accepted in transfer as part of the general education requirements at NDSU.

General Education Transfer

Students transferring general education credits within the North Dakota University System need to consult with advisors in their academic programs at NDSU for two reasons. First, degree requirements of individual programs and colleges at NDSU may exceed the university-wide general education requirements. Second, meeting the university-wide general education requirements by transfer credits may not necessarily prepare students for advanced, upper-division study in an academic major at NDSU.

North Dakota University System Transfer Agreement

The North Dakota University System (NDUS) General Education Requirements Transfer Agreement (GERTA) was established by the State Board of Higher Education to ease student transfers within the system. Although subject to revision by the board, the policies at the time of printing were the following:
1. If students have completed the lower-division general education course requirements (36 credits or more) at one NDUS institution and transfer to another NDUS institution, then the lower-division general education requirements will have been met.
2. If the general education requirements have not been completed before transferring, the general education courses from the indicated areas are applicable to an appropriate general education requirement of the institution to which they are transferred. In these cases, the number of credits required to complete the general education requirement in each area is determined by the policies of the institution to which the courses are transferred.

NDSU courses commonly accepted in transfer as general education courses at other ND University System institutions are designated in parentheses after the course title in the Course Descriptions section of this publication. For example, the designation (ND: Hum) indicates general approval of that course for ND University System transfer in the humanities category. (The general education category requirements across ND University System institutions are similar, but not identical.) Students transferring from non-ND University System institutions will have their general education requirements evaluated on a course-by-course basis when they enter NDSU.

Academic Degree Requirements

To receive a baccalaureate degree from NDSU, students must complete all of the requirements listed in this section as well as those specified for the particular degree program by a college within the university. Consult the appropriate section of this bulletin for sample curricula or contact the academic department for further information on degree requirements. Degree candidates must satisfactorily complete one of the degree curricula offered at NDSU. Because curricula are subject to change annually, students are responsible for determining curricular expectations according to the following guidelines:

1. Changes in intended degrees, as well as second majors and minors, must be declared to become official by providing notice to the Office of Registration and Records, 110 Ceres Hall. Curricular requirements are subject to change annually, and students are expected to follow the curriculum in place at the time the program of study was officially declared with the university.
2. Students may follow any published curricula declared with the university from the semester/year of entrance at NDSU or from the year of admission to a limited-enrollment program, whichever applies, to the year of graduation. Provided enrollment at NDSU has not been discontinued for more than one year.
3. Students who change their majors, minors, or type of degree are subject to the requirements in effect during the academic year in which the new curriculum was declared. Students may follow any published curricula from the year the new curriculum was declared to the year of graduation provided enrollment at NDSU has not been discontinued for more than one year.
4. Students who advance in limited-enrollment programs will have their academic program/plan status changed accordingly by the appropriate academic department.
5. Any student who discontinues enrollment at NDSU for more than one year is subject to meeting the curriculum requirements in effect at the time of re-entry. Each program of study presented by a candidate for the baccalaureate degree is audited for meeting the degree requirements by the Office of Registration and Records. Degree candidates are certified by the Office of Registration and Records according to total credits earned, institutional grade-point average, and other university requirements.

Baccalaureate Degrees

A degree is the title that the university confers on a graduate who has completed university requirements for graduation. NDSU confers the following degrees at the undergraduate level:

- Bachelor of Accountancy (B.Acc.)
- Bachelor of Arts (B.A.)
- Bachelor of Fine Arts (B.F.A.)
- Bachelor of Landscape Architecture (B.L.A.)
- Bachelor of Music (B.Mus.)
- Bachelor of Science (B.S.)
- Bachelor of Science in Agricultural and Biosystems Engineering (B.S.A.B.Eng.)
- Bachelor of Science in Civil Engineering (B.S.C.E.)
- Bachelor of Science in Computer Engineering (B.S.Cp.E.)
- Bachelor of Science in Construction Engineering (B.S.Con.E.)
- Bachelor of Science in Construction Management (B.S.Con.M.)
- Bachelor of Science in Electrical Engineering (B.S.E.E.)
- Bachelor of Science in Industrial Engineering and Management (B.S.I.E.Mgt.)
- Bachelor of Science in Manufacturing Engineering (B.S.Mfg.E.)
- Bachelor of Science in Mechanical Engineering (B.S.M.E.)
- Bachelor of Science in Nursing (B.S.N.)
- Bachelor of University Studies (B.U.S.)

In addition, NDSU awards graduate degrees at the following levels:

- Doctor of Education (Ed.D.)
- Education Specialist (Ed.S.)
- Master of Arts (M.A.)
- Master of Architecture (M.Arch.)
- Master of Business Administration (M.B.A.)
- Master of Education (M.Ed.)
- Master of Music (M.M.)
Second Degree
A second baccalaureate degree may be earned at NDSU with all of the following provisions:
1. All curriculum requirements are satisfactorily completed.
2. A 30-credit minimum is earned in residence beyond all of the credits and degree requirements for the first baccalaureate degree. All requirements for both degrees must be met, including the separate residency requirements at NDSU for each (36 for the first; 30 for the second). Any repeated courses do not count toward the 30 credits.
3. Each degree must be different. However, students may complete requirements for more than one major within a given degree, if available (see second/multiple majors).

Majors and Minors
Majors and minors are integral parts of baccalaureate degree curricula, particularly of those curricula that are largely elective.

Major: A major is a planned grouping of related courses that totals a minimum of 24 credits. Specific curriculum requirements for majors may be acquired from the appropriate departmental office or from Registration and Records.

Minor: A minor is a similar grouping of courses that totals a minimum of 12 credits. A minimum of eight credits must be earned in residence at NDSU. Students are responsible for following the requirements in place at the time a minor is officially declared with the university.

Second or Multiple Majors: A second (or multiple) major may be earned by completing the requirements of both (or all) majors offered under the same baccalaureate degree. At least 15 unique credits must exist between the both (or all) majors offered under the same baccalaureate degree, and official documentation issued.

Graduation Requirements
In fulfilling graduation requirements, two sets of requirements must be met: university-wide requirements, which include the general education and college- or department-level requirements, which include requirements for completing majors and minors. College- and department-level requirements for majors and minors are listed in the college sections of this bulletin under the appropriate college listing, and in curriculum guides available in Registration and Records and academic departments. University graduation requirements are as follows:

1. Academic major: Satisfactory completion of all requirements of the curriculum in which one is enrolled. Earn a minimum total of 122 credits in approved coursework. Requirements for some academic majors exceed this minimum.
2. General education requirements: Satisfactory completion of the general education requirements as specified.
3. Scholastic standing: A minimum institutional grade-point average of 2.00 based on work taken at NDSU for which grades have been assigned is required for graduation. When a course is taken and repeated at NDSU, only the last grade and credits earned will be used in computing the cumulative grade-point average; however, all attempts appear on the transcript. Some academic programs require more specific grade-point requirements.
4. Upper-level credit requirements: At least 37 of the credits presented for graduation must be in courses taken at the 300 and 400 level.
5. Residence requirements: Resident credits include credits registered and paid for at NDSU while attending classes offered on campus, in Tri-College, or via distance education. The last 30 credits must be earned in residence.
6. Transfer Students: A transfer student must earn a minimum of 60 semester credits from a four-year institution. Of these, at least 36 must be NDSU resident credits as defined above. Within these 36 resident credits, minimum requirements include 15 semester credits in courses numbered 300 or above (37 upper-level credits must still be earned in total) and 15 semester credits in the major field of study.
7. Financial obligations: Satisfy all financial obligations owed to the university.
8. Application for degree: All candidates for a baccalaureate or Pharmacy Doctorate degree must indicate their intent to graduate when registering for their last semester. The application forms are available in the Office of Registration and Records, or online at www.ndsu.edu/bisonconnection. Failure to apply by the published graduation application deadline of the planned semester of graduation may delay the awarding of the degree until the following semester. If a student fails to complete the required courses by the intended graduation term, the student must reapply for graduation in a following term.

Certificates
A certificate program is a specialized course of study requiring at least 16 credit hours at the undergraduate level or eight credit hours at the graduate level. Certificates may be earned while in pursuit of a degree or as standalone programs of study. Prospective students interested in certificate programs, but not seeking a degree, must be accepted to the university. Contact the Office of Admissions or the Graduate School for further information. Curricular requirements and verification forms are available in academic departments offering certificates. Completed forms must be signed by the appropriate department chair (and Graduate School, if applicable) and submitted to Registration and Records in order for the certificate to be posted to a student’s academic record and official documentation issued.

Exceptions to Academic Program Requirements
Academic policies and requirements are designed to ensure that programs at NDSU are consistently of high quality. All university requirements prescribed by the University Senate must be met. Students may request substitutions or waivers for college or departmental requirements when extenuating circumstances prevail.

Degree Audits
An official Degree Audit Request from the Office of Registration and Records is sent to students according to current number of credits earned. Students can expect to receive the Audit Request once they have completed a minimum of 75 total credits.

Graduation with Honor
Graduation with honor applies only to the baccalaureate and Pharm. D. degrees. Graduate courses are not included in the computation. Candidates who entered NDSU as freshmen and who have earned a minimum institutional grade-point average of 3.50 will graduate with honor. Candidates with transfer credits must meet the minimum institutional grade-point average of 3.50 for all credits earned at NDSU, as well as a cumulative grade-point average of 3.50 for all credits earned including those from transfer work. All grades and all attempts of repeated courses are included in grade-point average calculations for graduating with honor. Students who meet these academic criteria will graduate according to one of the following honor levels:

- Cum Laude – equal to or greater than 3.50 and less than 3.70
- Magna Cum Laude – equal to or greater than 3.70 and less than 3.90
- Summa Cum Laude – equal to or greater than 3.90

Degree Posting
Earned degrees are posted to academic records approximately three weeks following the close of the semester in which degree requirements were successfully completed, provided students declared their intent to graduate in that same term with the Office of Registration and Records.

Diplomas
Diplomas are mailed approximately six weeks following the close of the academic term in which graduation requirements have been completed. Neither diplomas nor official transcripts will be released for students who have outstanding debts owed to the university. Students are responsible for submitting any name and address corrections for diploma processing. A diploma replacement service is provided by the Office of Registration and Records for those who have lost or damaged their diploma. The cost is $25.

Commencement
Commencement exercises are held at the close of fall and spring semesters. Students who complete graduation requirements during the summer are eligible to participate in the May commencement exercises. To participate in the May commencement exercises, students must be registered in the remaining graduation requirements for the summer session of the same year. Individual colleges may set more stringent requirements.

A student may participate in commencement only once for a particular degree. The date of degree conferral will be printed on the diploma according to the academic calendar of the university.

Reservations for commencement must be made by the date specified by the Office of Registration and Records. Orders for caps, gowns, and hoods are made by the date specified by the NDSU Bookstore. Commencement information is available at www.ndsu.edu/Registrar/commencement.

Evaluation of Transfer Credit
The Office of Registration and Records administers the NDSU policies governing the acceptance of credit from outside institutions. These requirements apply to returning students who have attended other institutions, as well as new transfer students. Before credits may be evaluated for specific NDSU course equivalency or application to departmental programs, transfer courses must be accepted for university credit according to the following guidelines:

- College-level coursework from regionally accredited colleges or universities (or equivalent for international institutions) is eligible for acceptance in transfer.
2. Courses accepted in transfer will not replace any grades or credits earned at NDSU.
   If a course is completed at NDSU and an attempt is made to repeat that course elsewhere, the credit is considered duplication and is not eligible for transfer.
3. Credit for a remedial course is not accepted for transfer if the course is remedial by definition of the transferring institution or if it is equivalent to a remedial course at NDSU. It may, however, fulfill prerequisite requirements.
4. Technical or vocational coursework from regionally accredited institutions may be accepted as free elective credit only.
5. Credit will be evaluated not only as it appears on the transcript, but also on the basis by which the credit was initially awarded by the sending institution. Credit by examination or life experience is not accepted for transfer.
6. The Office of Registration and Records determines the applicability of transfer credit toward NDSU general education requirements according to institutional and North Dakota University System guidelines, where applicable.
7. College-level credits that do not have course equivalents at NDSU will be accepted as free electives and may count only toward total credits. The academic department may determine whether these transfer electives may satisfy specific curricular requirements through a course substitution process. (See also General Education Administrative Policies.)
8. NDSU requires a minimum of 37 credits toward a baccalaureate degree be earned at the junior or senior (300- and 400-level) level. Therefore, while a freshman- or sophomore-level (100- or 200-level) course transferred from another institution may satisfy a specific upper-level program requirement at NDSU, that course will not be counted toward the 37-credit upper-division degree requirement.
9. Transferable courses with D grades or above will be accepted by the university; however, colleges and departments may have higher standards to determine course applicability toward their respective majors and programs.
10. The name of transfer institutions and total credits accepted by NDSU will be indicated on the official NDSU transcript. Individual transfer courses are not detailed on the academic record, but will be provided in a Transfer Equivalency Worksheet after admission to the university.
11. Total transfer credits are converted to semester credits, if applicable.
12. Transfer grades are not recorded nor computed in the institutional cumulative GPA. They are used only for purposes of admission to the University and to certain programs, as well as for determining eligibility to graduate with honors.

Common Course Numbers
Institutions in the North Dakota University System have established common course numbers (CCN) for many courses to facilitate transfer within the system. Under the CCN agreement, transfer students who have successfully completed CCN courses will not be required to retake them at NDSU unless their degree program requires a higher grade. However, CCN courses will not fulfill residence requirements nor will 100- and 200-level courses fulfill upper-division requirements for graduation.

Credit by Examination
Students may demonstrate evidence of college-level achievement through the use of nationally standardized tests. Competency to write these examinations may have been gained through intensive preparation in high school, extensive reading in a particular field, or other types of formal or informal preparation. A student may not repeat by proficiency testing a course that has been previously taken or failed at NDSU or another accredited institution. Score reports must be sent directly to NDSU from the awarding agency/board. School reports and student-issued grade reports are not considered official for purposes of awarding credit by examination.

International Baccalaureate (IB)
NDSU recognizes the International Baccalaureate program, offered at many high schools in the United States and abroad, which allows students to take examinations for credit. The examinations are offered at the standard (SL) and higher (HL) levels. In accordance with North Dakota University System policy, students must receive a predetermined minimum score on higher-level (HL) examinations to qualify for possible awarding of credit and advanced placement, which is determined by the appropriate academic department on campus. Credit earned through IB may not be used to satisfy residence-credit requirements for graduation. A current listing of IB examinations that have been evaluated for credit and their NDSU equivalent courses is available at www.ndsu.edu/ndsu/admission/credit_by_exam.shtm#Subject.

<table>
<thead>
<tr>
<th>IB Examination</th>
<th>NDSU Course Equivalent</th>
<th>General Ed</th>
<th>Semester Credits</th>
<th>Minimum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>BIOL 150/150L &amp; 151/151L</td>
<td>S/L</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry</td>
<td>CHEM 121/121L &amp; 122/122L</td>
<td>S/L</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>English</td>
<td>ENGL 220</td>
<td>A</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>History (Africa)</td>
<td>Free Elective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History (Americas)</td>
<td>HIST 103 &amp; 104</td>
<td>A</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>History (Asia)</td>
<td>Free Elective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History (Europe)</td>
<td>HIST 102</td>
<td>A</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>History (Islamic)</td>
<td>Free Elective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History (Middle East)</td>
<td>Free Elective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>MATH 103 &amp; 105</td>
<td>6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>Free Elective</td>
<td></td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Psychology</td>
<td>PSYC 111</td>
<td>B</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

College Level Examination Program (CLEP)
CLEP is a national testing program sponsored by the College Entrance Examination Board (CEEB). NDSU accepts official score reports for the Subject Examinations only.

According to North Dakota University System policy, a minimum score of 50 is required to receive credit for CLEP subject examinations. If NDSU does not have an equivalent course, free elective credit may be awarded. A complete and current listing of CLEP subject examinations and their NDSU equivalent courses is available at www.ndsu.edu/ndsu/admission/credit_by_exam.shtm#Subject.

The following CLEP policies apply at NDSU:
1. The Subject Examination should be taken prior to enrollment in the equivalent or more advanced college-level course.
2. Scores from a Subject Examination may not be used to establish credit for a course previously taken and failed or for a course in which the student is currently enrolled.
3. Six months must elapse before a Subject Examination may be repeated.
4. Credit earned through CLEP is not residence credit and may not be used to satisfy residence-credit requirements for graduation.

CLEP Registration and Fees:
NDSU is a national testing center for students wishing to take CLEP examinations. CLEP Examinations are computerized and administered as needed. To register for a CLEP Examination, contact the NDSU Counseling Center, 212 Ceres, 231-7671. The current fee for each of the Subject Examinations is $90.

<table>
<thead>
<tr>
<th>CLEP Examination</th>
<th>NDSU Course Equivalent</th>
<th>General Ed</th>
<th>Semester Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman College Composition</td>
<td>ENGL 110</td>
<td>C</td>
<td>3</td>
</tr>
<tr>
<td>English Literature</td>
<td>ENGL 251 &amp; 252</td>
<td>A</td>
<td>6</td>
</tr>
<tr>
<td>American Literature</td>
<td>ENGL 261 &amp; 262</td>
<td>A</td>
<td>6</td>
</tr>
<tr>
<td>Analyzing &amp; Interpreting Literature</td>
<td>ENGL 271</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>French Language (Level I)</td>
<td>FREN 101</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>French Language (Level II)</td>
<td>FREN 101 &amp; 102</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>German Language (Level I)</td>
<td>GERM 101</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>German Language (Level II)</td>
<td>GERM 101 &amp; 102</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>Spanish Language (Level I)</td>
<td>SPAN 101</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>Spanish Language (Level II)</td>
<td>SPAN 101 &amp; 102</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>Score of 59 required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score of 63 required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prin of Microeconomics</td>
<td>SPAN 101 &amp; 102</td>
<td>A</td>
<td>8</td>
</tr>
<tr>
<td>Prin of Macroeconomics</td>
<td>ECON 201</td>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>Western Civilization I: Ancient Near East to 1648</td>
<td>HIST 101</td>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td>Western Civilization II: 1648 to Present</td>
<td>HIST 102</td>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td>U.S. History I: Early Colonization to 1877</td>
<td>HIST 103</td>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td>U.S. History II: 1865 to Present</td>
<td>HIST 104</td>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td>American Government</td>
<td>POLS 115</td>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to Psychology</td>
<td>PSYC 111</td>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>Intro to Educational Psychology</td>
<td>Free Elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Growth &amp; Development</td>
<td>PSYC 250</td>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>Introductory Sociology</td>
<td>SOC 110</td>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>Biology</td>
<td>BIOL 150/150L</td>
<td>S/L</td>
<td>4</td>
</tr>
</tbody>
</table>
Advanced Placement Examination

Students from high schools that participate in the Advanced Placement Program may earn credit through examinations provided by the College Entrance Examination Board (CEEB). The examinations are administered at the conclusion of a college-level course taught in participating high schools. The scores are forwarded, upon student request, to the college of choice.

In accordance with North Dakota University System policy, a minimum score of three is required to receive credit for the following Advanced Placement (AP) examinations. If NDsu does not have an equivalent course, free elective credit may be awarded. Credit earned through AP is not residence credit and may not be used to satisfy residence-credit requirements for graduation. A complete and current listing of AP examinations and their NDsu equivalent courses is available at www.ndsu.edu/ndsu/admission/credit_by_exam.shtml#Subject.

### AP Examination

<table>
<thead>
<tr>
<th>NDSU Course Equivalent</th>
<th>General Ed</th>
<th>Semester Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art History</td>
<td>ART 210 &amp; 211</td>
<td>A</td>
</tr>
<tr>
<td>Biology</td>
<td>BIOL 111/111L</td>
<td>S/L</td>
</tr>
<tr>
<td>Chemistry</td>
<td>CHEM 121/121L</td>
<td>S/L</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>CSCI 160</td>
<td>8</td>
</tr>
<tr>
<td>Computer Science AB</td>
<td>CSCI 160 &amp; 161</td>
<td>8</td>
</tr>
<tr>
<td>Microeconomics</td>
<td>ECN 201</td>
<td>B/G</td>
</tr>
<tr>
<td>Macroeconomics</td>
<td>ECN 202</td>
<td>B/G</td>
</tr>
<tr>
<td>Engl Lang &amp; Comp</td>
<td>ENGL 110</td>
<td>C</td>
</tr>
<tr>
<td>Engl Language Exam</td>
<td>ENGL 112</td>
<td>C</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>BIOL 124/124L</td>
<td>S/G/L</td>
</tr>
<tr>
<td>European History</td>
<td>HIST 101 &amp; 102</td>
<td>A</td>
</tr>
<tr>
<td>French Language</td>
<td>FREN 101 &amp; 102</td>
<td>A/G</td>
</tr>
<tr>
<td>French Literature</td>
<td>Free Elective</td>
<td>3</td>
</tr>
<tr>
<td>German Language</td>
<td>GERM 101 &amp; 102</td>
<td>A/G</td>
</tr>
<tr>
<td>Comparative Gov &amp; Politics</td>
<td>POLS 225</td>
<td>3</td>
</tr>
<tr>
<td>U.S. Gov &amp; Politics</td>
<td>POLS 115</td>
<td>B</td>
</tr>
<tr>
<td>Human Geography</td>
<td>GEOG 151</td>
<td>B/G</td>
</tr>
<tr>
<td>Latin Literature</td>
<td>CLAS 101</td>
<td>A</td>
</tr>
<tr>
<td>English Lit &amp; Comp</td>
<td>ENGL 220</td>
<td>A</td>
</tr>
<tr>
<td>Calculus AB</td>
<td>MATH 165</td>
<td>R</td>
</tr>
<tr>
<td>Calculus BC</td>
<td>MATH 165</td>
<td>R</td>
</tr>
<tr>
<td>Music Theory</td>
<td>Free Elective</td>
<td>6</td>
</tr>
<tr>
<td>Astronomy</td>
<td>PHYS 215/215L</td>
<td>S/L</td>
</tr>
<tr>
<td>Electrical &amp; Magnetism</td>
<td>PHYS 252/252L</td>
<td>S/L</td>
</tr>
<tr>
<td>Psychology</td>
<td>PSYC 111</td>
<td>B</td>
</tr>
<tr>
<td>Spanish Language</td>
<td>SPAN 101 &amp; 102</td>
<td>A/G</td>
</tr>
<tr>
<td>Spanish Literature</td>
<td>Free Elective</td>
<td>3</td>
</tr>
<tr>
<td>Statistics</td>
<td>Free Elective</td>
<td>3</td>
</tr>
<tr>
<td>Studio Art 2D-Design</td>
<td>ART 122</td>
<td>3</td>
</tr>
<tr>
<td>Studio Art 3D-Design</td>
<td>ART 124</td>
<td>A</td>
</tr>
<tr>
<td>Studio Art-Free Elective</td>
<td>ART 130</td>
<td>A</td>
</tr>
<tr>
<td>U.S. History</td>
<td>HIST 103 &amp; 104</td>
<td>A</td>
</tr>
<tr>
<td>World History</td>
<td>Free Elective</td>
<td>6</td>
</tr>
</tbody>
</table>

**DSST Examinations**

NDsu recognizes the DSST (Dantes) examination, which was originally designed for the military as a way to provide individuals an opportunity to obtain college level credit for what they have learned in nontraditional ways. Now available for civilian use, the DSST Test Control Officer (TCO) administers the exams on more than 560 military installations and official DSST test centers. The main users of the exams include adult education programs, U.S. Department of Defense, and two- and four-year colleges and universities. In accordance with North Dakota University System policy, students must receive a minimum score on the examinations to qualify for possible awarding of credit and advanced placement, which is determined by the appropriate academic department on campus. If NDsu does not have an equivalent course, free elective credit may be awarded. Credit earned through DSST may not be used to satisfy residence-credit requirements for graduation. A current listing of DSST examinations that have been evaluated for credit and their NDsu equivalent courses is available at www.ndsu.edu/ndsu/admission/credit_by_exam.shtml#Subject.

| Course Challenge |

A student who is currently registered may seek credit by challenging a course. A course challenge usually consists of a special comprehensive examination; however, additional types of performance may be required for some courses. A course challenge is only permitted for courses in which the student has not previously registered for credit. Further, credits earned by course challenge will not satisfy requirements toward a graduate degree.

Procedures for pursuing a course challenge include the following:

2. Obtain approval from the instructor of the course, chair of the department, and dean of the college. Clarify expectations of the challenge, e.g., examination only or examination plus other performance. Based on the nature of the course and content area, some courses may not be approved for challenge by the department.
3. Pay the course challenge fee at the Bison Connection after receiving approval for the challenge (50% of the regular credit tuition charge not subject to tuition cap).
4. Arrange a mutually convenient date and time for the challenge with the instructor or department.
5. Upon receipt of the signed Petition for Course Challenge form from the department, courses and credits successfully challenged are listed on the student’s academic transcript, but are not graded. Unsuccessful challenges are not recorded.

Academic Planning and Registration

Students are advised to prepare long-range plans according to curricular guidelines for the degree program selected. Attention to such details as semester credit loads and course sequences are recommended for optimum experiences.

Academic Year

NDSU operates on a semester system consisting of two 16-week fall and spring semesters, including final examination weeks. A 12-week summer session is offered, and includes standard 4-week and 8-week courses. Variable-length, short-term courses also are offered each semester, however, the total contact (class) hours are the same as the regular semesters.

Academic Credit

A credit is a unit used to compute the amount of work required for graduation. One semester credit is equivalent to one lecture period (50 minutes) in class per week for one semester. In the case of laboratories, a minimum of two 50-minute periods per week for one semester is equivalent to one credit. Most workshops require one and one-half hours per week for one semester for one credit. Credit for field experiences/internships may vary.

Academic Advising

The academic advising program at NDSU is designed to facilitate the student’s intellectual and personal growth, to assist students in using university resources, and to guide students in making informed choices regarding academic and career plans. Following admission to NDSU, each student is assigned an advisor from the college or department in which the student is majoring. If a major has not been declared, an assignment is made with an advisor in the College of University Studies. An advisor assists a student in selecting courses to ensure a well-balanced education and helps interpret university and college policies and requirements. However, students are fully responsible for their academic decisions including selecting courses, meeting course prerequisites, corequisites/prerequisites, and adhering to policies, procedures, and deadlines. An advising period, known as Advising Week, typically begins one week prior to registration each semester. Students should see their advisor prior to registration. Students with advisor holds are required to meet with their advisors to have the hold lifted. Advisor assignments and holds may be viewed on Campus Connection.

The Office of Registration and Records serves as the centralized support center for academic advising on campus. Each of the colleges on campus has a designated staff member in Registration and Records who serves as a liaison to support and facilitate academic advising activities.

Because of the diverse student population at NDSU, other advisory services are provided to meet special needs. Refer to the sections on Student Programs and Services and Special Instructional Support Programs for descriptions of additional services.

Registration

Registration is required of all who attend classes. Dates and deadlines for advising and registration are made available in the NDSU Academic Dates and Deadlines calendar posted online at www.ndsu.edu/bisonconnection. Students should see their advisor before they register (See Academic Advising).

Schedule of Classes: The most current and complete listing of classes is made available on Campus Connection prior to Advising Week. A course listing also is available at www.ndsu.edu/bisonconnection.

Online Registration: Enrolled students may register online via Campus Connection, NDSU's student information system. Registration instructions are posted online at www.ndsu.edu/bisonconnection.

On-site Registration: On-site registration is provided for new students and for those who are unable to or who choose not to register online.

For registration purposes, students are grouped into the following three general categories:

- Currently enrolled students: Currently enrolled students are assigned registration appointment times according to total credits earned. Registration appointments may be viewed on Campus Connection. Registration for summer session may be completed during the previous spring at the same time as registration for fall semester.
- Returning students: Returning students are those who have previously attended NDSU, but who have not been in attendance for at least one full regular semester (fall or spring). Returning students are assigned registration appointment times according to total credits earned after the Reactivation/Petition for Readmission is received and processed in the Office of Registration and Records. Registration appointment times may be viewed on Campus Connection.

New students: Detailed information regarding orientation and registration options is sent to all new students from the Office of Orientation and Student Success. Admitted transfer students may register on Campus Connection along with NDSU students, or may attend a transfer orientation and registration program. Registration appointment times are based on the total number of credits accepted in transfer to NDSU.

Dual Career/Level Registration

1. Graduate students who wish to enroll in graduate coursework must follow the procedure below that most closely matches their academic intent:
   a. If undergraduate coursework is a prerequisite or condition of admission to a graduate program of study, obtain approval from the Graduate School. This coursework will be charged at the undergraduate rate and will be recorded on an undergraduate record.
   b. If undergraduate coursework is to be applied to an undergraduate program in which the student plans to enroll concurrent with a graduate program of study, submit either an Undergraduate Application for Admission (if never enrolled as an undergraduate at NDSU) or a Reactivation Form (if previously enrolled as an undergraduate at NDSU). This coursework will appear on an undergraduate record and be charged at the undergraduate rate.
   c. If undergraduate coursework is to be applied to a graduate program of study (select programs only), obtain approval from the Graduate School. This coursework will appear on a graduate record and be charged at the graduate rate.

2. Undergraduate students who wish to enroll in graduate coursework must follow the procedure below that most closely matches their academic intent:
   a. If graduate coursework is to be applied to a graduate program of study, student must be admitted to the Graduate School. This coursework will appear on a graduate record and be charged at the graduate rate.
   b. If graduate coursework is to be applied to an undergraduate program of study (such as in substitution for a degree requirement), departmental permission is required. This coursework will appear on an undergraduate record and will be charged at the undergraduate rate.

Forms and instructions for ensuring that undergraduate and graduate coursework are applied to the appropriate academic career records are available at www.ndsu.edu/bisonconnection.

Changes in Registration

Registration deadlines for standard-length fall and spring semester courses are posted online. Deadlines for variable length and summer session courses are adjusted proportionately.

Adding Courses/Sections

Students may add courses to their schedules via Campus Connection until the published deadline to add online. After this deadline, an unauthorized “Class Permit” for each course to be added must be acquired from the department offering the course and submitted to the Office of Registration and Records or Bison Connection.

Dropping Courses/Sections

No-record drops: Students may drop a course from their schedule without it appearing on their academic record until the published No Record Drop deadline.

Record (W) drops: Students may continue to drop courses after the no-record drop period until the published Drop deadline. However, such drops will be recorded on student transcripts with 'W'. These indicators do not affect grade-point averages, but are counted in attempted credits for financial aid satisfactory academic progress.

Auditing Courses

An auditor may attend classes only as a listener, without participation in regular class exercises, and may be admitted to classes only with a class permit and official registration as an auditor. No credit is received for audited courses, and “AU” appears on the transcript. A student cannot fail an audit; however, an instructor may assign a “W” (withdrawn) for non-attendance.

A student may drop a regularly registered course and add it as an audit course by submitting a Class Permit by the published deadline. Once the audit registration is processed, the decision cannot be reversed. An audit fee is one-half of the regular tuition rate, and may be included in the tuition cap.

Instructor’s Drop Policy

Instructors have the option to administratively drop students who have not attended the first week (and is some cases, the first meeting) of a lecture or laboratory. However, this option seldom is exercised by departments or instructors. Students are responsible for all course registration activity and should drop courses that they do not intend to complete.
Failure to drop courses by posted deadlines may result in failing grades and debt owed the university, which might otherwise have been avoided. Administrative course drop requests by departments are submitted to and processed by the Office of Registration and Records.

Cancellation of Registration
Students who register and then decide not to attend NDSU before the semester start date must cancel their registration by submitting a Cancellation Form. Forms are available at www.ndsu.edu/bisonconnection. Cancellations are not accepted by telephone, and it is not possible to cancel registration or to drop an only or last course online.

Withdrawal to Zero Credits
Students who have registered and then wish to drop all courses after the semester start date must officially withdraw from the university. Failure to initiate the withdrawal process may result in "F" grades and financial obligations that otherwise might be avoided. Refer to the section on Financial Information for prorated refund deadlines for withdrawals. Procedures to withdraw from all courses include the following:
1. Read and complete the “Withdrawing to Zero Credits” form available at www.ndsu.edu/bisonconnection.
2. Contact the Counseling Center or Disability Services if assistance is needed in addressing academic, personal, financial, or other concerns.
3. Withdrawal forms are to be submitted to Bison Connection, Memorial Union.
4. Students are responsible for any unpaid bills at the time of withdrawal.
5. Withdrawal forms must be submitted by the published deadline of the semester. Withdrawals after this date will not be processed without evidence of a compelling reason or circumstances beyond the student's control. Courses already completed at the time of withdrawal from a term will be withdrawn as well.
6. Students should not attempt to drop all of their courses, their last course or their only course online. Unlike refunds for individual course drops, withdrawal refunds are prorated and are based on complete withdrawals and withdrawal dates.

Classification of Students
Undergraduate degree-seeking students are classified according to the total number of credits earned. Classification in a declared program or plan of study may vary from the classification used by the university in determining academic standing, financial aid award levels, etc.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Completed Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>0 - 26</td>
</tr>
<tr>
<td>Sophomore</td>
<td>27 - 59</td>
</tr>
<tr>
<td>Junior</td>
<td>60 - 89</td>
</tr>
<tr>
<td>Senior</td>
<td>90 or more</td>
</tr>
</tbody>
</table>

Credit limitations may be placed on students who have not been fully admitted to a degree program at NDSU:

Undergraduate non-degree/special student: One who is not seeking a degree or has not completed the formal application process for admission. A maximum of 15 credits may be completed while under special status.

Conditional graduate standing: One who holds a baccalaureate degree and shows potential for successful graduate study, but does not meet all requirements for admission or has not satisfactorily completed prerequisite coursework. A maximum of 12 credits may be completed while under conditional status. Students may, in consultation with their major advisor, request a change to full graduate standing after demonstration of specified capability in graduate studies.

Graduate non-degree standing: One who holds a baccalaureate degree from an institution of recognized standing may enroll as a non-degree student. This category is incorporated with a lecture, one-credit courses, and quizzes that account for less than 5% of the students' overall grade. If a professor chooses to give an exam during the last week of classes, he/she is expected to make some instructional use of the final examination time.

Class Attendance
Attendance in classes is expected. Only the course instructor can excuse a student from course responsibilities. (The term course includes class, laboratory, field trips, group exercises, or other activities.) If class attendance is a component of the course grade, the course instructor must clearly communicate this to the class in the syllabus.

The course instructor must inform students on the first day of class and in writing in the syllabus (1) of their policy regarding class absence and (2) policy, if any, for making up missed assignments. It is recognized that sometimes an assignment is impossible to make-up. Although the course instructor should exercise a fair and consistent standard for resolving questions of missed assignments, the type, extent, manner, and time frame of the make-up assignments shall be at the discretion of the instructor.

Students are responsible for informing course instructors of absences. If absences are known (e.g., university sanctioned activity), course instructors shall be informed with written notification as far in advance as possible (preferably two-week notice). Where advance notification is not possible (e.g., illness, family emergency, etc.), students should contact their course instructor as soon as possible about the absence. When a student misses class for any reason, the student is expected to make arrangements with the course instructor to follow the course instructor's policy in making up any missed assignments, if permitted (NDSU Policy, Section 333).

Student Records
Grades and Honor Points
The quality of student work is indicated by a letter grade. In computing scholastic averages, each letter grade is assigned a specific number of honor points for each credit earned. Student work is reported in terms of grade-point average for the term and institutional grade-point average for the composite of work at NDSU. Calculations are based on the following:

<table>
<thead>
<tr>
<th>Grade Descriptions</th>
<th>Honor Points for Each Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>B</td>
<td>Good 3.0</td>
</tr>
<tr>
<td>C</td>
<td>Average 2.0</td>
</tr>
<tr>
<td>D</td>
<td>Passing 1.0</td>
</tr>
<tr>
<td>P</td>
<td>Pass (D or better)</td>
</tr>
<tr>
<td>S</td>
<td>Satisfactory (C or better)</td>
</tr>
<tr>
<td>W</td>
<td>Withdrew</td>
</tr>
<tr>
<td>AU</td>
<td>Audit</td>
</tr>
<tr>
<td>Nonpassing Grades</td>
<td>Honor Points for Each Credit</td>
</tr>
<tr>
<td>F</td>
<td>Failure 0.0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
</tr>
<tr>
<td>U</td>
<td>Unsatisfactory</td>
</tr>
</tbody>
</table>

* Not calculated in grade-point average.
Grade-Point Average Calculation
Institutional cumulative grade-point average is calculated by dividing the total number of honor points earned at NDSU by the total number of credit hours in which honor points were recorded, including grades of F. NDSU GPA calculations do not include developmental coursework that does not count toward the graduation requirements nor does it include coursework grades accepted in transfer. Refer also to pass/fail grading and repeated courses.

Pass-Fail Grading
Pass-fail grading is available in any given course; however, the pass/fail option may not be used for courses taken to meet general education requirements, unless the course is only offered pass/fail. Students are advised to check degree-program restrictions regarding acceptance of pass/fail credits. Request forms may be acquired online at www.ndsu.edu/bisonconnection. Forms must be signed by the student's advisor. Pass/fail policies include the following:
1. Students are limited to a total of 16 credits under the pass/fail grading option. Courses that are offered only pass/fail, for all students who enroll are not included in the 16-credit limitation.
2. Approval for the pass/fail option must be filed in the Office of Registration and Records by the published pass/fail deadline of the semester. Variable length and summer courses have prorated deadlines according to actual course length.
3. Once a pass/fail request has been approved and filed, it may not be changed back to a regular grade.
4. A grade of P is without honor points and is not included in the grade-point computation; however, a grade of F is included in the grade-point computation.
5. If a course is taken for a regular grade, it cannot be repeated on a pass/fail basis.

Grades of Incomplete
Under extraordinary circumstances and at the discretion of the instructor, a student may be assigned a grade of Incomplete (I). The following policies apply to Incomplete grades:
1. The grade of Incomplete is assigned to indicate that satisfactory work has been completed up to within five weeks of the semester end, and that circumstances beyond the student's control prevented completion of the work. The time period is proportional for variable length courses and summer session.
2. The grade of Incomplete is not to be given in any instance where the student has a deficiency of more than five weeks (or equivalent) of work including final exam week.
3. Grades of Incomplete are initiated by student request. The student must contact the instructor, request an Incomplete grade, and, upon instructor approval, make arrangements to complete the work.
4. The grade of Incomplete (I) is an administrative grade that may only be entered by the Office of Registration and Records, except in courses designated as practicum, internship, individual study, field experience, or study abroad.
5. An Incomplete Grade Reporting Form detailing the work to be completed, expected completion date, and grading standard is to be signed and dated by both the instructor and the student. The form is to be submitted to the Office of Registration and Records by the grade submission deadline for the semester in which the course was taken. It is advisable that the instructor, student and advisor retain copies of this form for their records.
6. Grades of Incomplete, including those for most course types identified in #4, must be removed no later than the end of the seventh week of the next full semester (fall or spring). The time period is proportional for variable length courses and summer session.
7. Grades of Incomplete are removed when the student has completed all course requirements and the instructor of the course files a Grade Reporting Form with the Office of Registration and Records.
8. All grades of Incomplete that are not removed within the specified time are automatically changed to F grades by the Office of Registration and Records.
9. Instructors may specify completion deadlines for remaining work on the Incomplete Grade Reporting Form earlier than the standard deadlines.
10. Requests for extensions beyond the seventh week of the next full semester require approval by both the instructor and the chair of the department offering the course. The extended deadline must be indicated on the Incomplete Grade Reporting Form and may not exceed two Incomplete conversion/deadline cycles. If a grade is not submitted by the specified deadline, the Incomplete grade will convert to a grade of F.
11. Grades of Incomplete, which convert to grades of F, earned in the last semester of attendance by a student who leaves the university for two or more years may be changed to Withdrawn (W) upon re-enrollment. Requests for this privilege must be filed with the Office of Registration and Records during the first term of re-entry.
12. An Incomplete grade may be converted to a letter grade (or P/F, S/U) according to the above guidelines, but may not be expunged from the record.
13. Students may not register in courses in which they currently hold grades of Incomplete, except for courses that are repeatable for credit.
14. Students are not allowed to graduate with Incomplete grades on their academic records.
15. Upon graduation, unconverted Incomplete grades will convert to grades of F. If a course in which an Incomplete grade was assigned is required for graduation, the instructor may extend the deadline according to the above procedures and timelines, and graduation will be postponed.
16. Students who receive grades of Incomplete or converted grades of F may appeal disputed grades in accordance with NDSU Policy, Section 337: Grade Appeals Board.

Course Failures
The grade of F may not be removed by special examination or transfer credit. When a grade of F has been received in any given course, credit for that course may be earned only by re-enrollment in it at NDSU, or via Tri-Colleges, and completing it satisfactorily. As with all repeated courses, the original grade will remain on the academic record, but only the latest attempt will be computed in grade-point average calculations (see Repeated Courses).

Grade Changes and Grade Appeals
With the exception of Incomplete grades, a course grade is considered final unless an appropriate appeal is filed by the student. For the student who has reason to believe the grade issued is incorrect, the student must initiate a request for a change of a grade with the instructor within fifteen (15) instructional days of the first day of the semester immediately following the semester in which the grade was awarded. For Spring Semester courses, the request may be made within fifteen (15) instructional days of the start of Fall Semester, if the student is not enrolled for a Summer term.

A grade appeal is deemed formally initiated when the student presents the Grade Appeal Form to the instructor. If there is uncertainty the student must consult the department head, and the dean or a designated college committee, proceeding from one level to the next only after an unsatisfactory decision of the conflict at that level. In the event that the instructor is also the department head or dean, he or she need only be consulted in the capacity of advisor. In the event of an unsatisfactory decision within the college, the student may submit the formal written appeal to the Grade Appeals Board Chair. Such an appeal shall be made within fifteen (15) instructional days after conclusion of the college proceedings as stated above.

The full Grade Appeals policy (section 337), which includes hearing procedures, is available at www.ndsu.edu/policy/337.htm. Grade changes only may be considered for students who have not yet earned a degree for which the course in question was applied.

Repeated Courses
If students wish to take advantage of the repeated course opportunity to improve a grade, then that course must be repeated at NDSU, with one exception only. NDSU students may register for a Tri-College course to repeat a course previously taken at NDSU. If a course is completed at NDSU and an attempt is made to repeat that course elsewhere, the credit is considered duplicate and is not eligible for transfer.

When a course is repeated at NDSU, all attempts remain on the academic record but only the credits, grades, and related honor points for the most recent attempt will be used in calculating the cumulative grade-point average and counted toward credits for graduation. However, all credits attempted and grades received will be used in computing graduation with honors. Students forfeit the previous grade no matter what grade is earned when the course is repeated.

All repeated courses are noted on the transcript to indicate the course was repeated in a following term and excluded from cumulative totals. In courses that are repeatable for credit, students must notify the Office of Registration and Records if they re-enroll for purposes of grade improvement.

Courses taken for regular A-F grades may not be repeated for pass-fail grades.

The course-repeat option to improve one's academic record is available to students who have not graduated.

Academic Forgiveness
A former NDSU student who has not completed a baccalaureate degree and has not been in attendance at NDSU for six (6) or more years, but who is presently enrolled at NDSU may request to exclude from grade-point-average calculations all grades earned in selected full terms (quarters or semesters) completed at NDSU prior to the six-year interval.

The courses and grades for the terms selected will remain on the student's academic record, but grades will be excluded from grade-point average calculations. Excluded courses cannot be used to satisfy any academic requirements. A student may exercise this option only once by submitting a written request to the Office of Registration and Records.

Transcripts
Transcript may be requested online through Campus Connection (current students) or through www.getmytranscript.com (former students). Online ordering provides 24/7 access and additional tracking information. According to federal law, telephone requests and requests from others on behalf of the student cannot be honored. There is a charge for an official transcript. See www.ndsu.edu/registrar for detailed transcript fee information. 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 transcript only includes detailed work completed at NDSU. Requests for transcripts of work completed elsewhere must be made directly with the respective institution. Current students may obtain unofficial transcripts, free of charge, on Campus Connection.
Correction of Transcript Errors
Students may access their grades online at the end of each term approximately one week after the last day of final examinations. If a student becomes aware of an error in recording on the transcript, the student should first contact the instructor to verify the grade. If the error appears to be in term or cumulative calculations, students should contact the Office of Registration and Records. See also the section on Grade Appeals.

Scholastic Standards
Academic progress is measured by grades and credits earned. Students receive acknowledgment for high academic achievement and are given early warning when they become academically deficient.

Academic Honesty
The primary responsibility of the students, faculty, and administration is to create an atmosphere where the honesty of individuals will not be questioned.

Faculty members are responsible for providing guidelines concerning cheating and plagiarism at the beginning of each course, and should use precautionary measures and security in cases where cheating is likely to occur.

Students are responsible for submitting their own work. Students who cooperate on oral or written examinations or work without authorization share the responsibility for violation of academic principles, and are subject to disciplinary action even when one of the students is not enrolled in the course where the violation occurred. Students have the right to be informed when they are suspected of violating academic principles and have the right to a fair opportunity to refute them.

Faculty have the prerogative of determining the penalty regarding prohibited academic conduct in their classes. Faculty members may, among other sanctions, fail the student for the particular assignment, text, or course involved. Penalties may be varied with the gravity of the offense and the circumstances of the particular case.

In this situation, the student may not drop the course in question without the permission of the instructor. Faculty members will provide a written statement of the action to the department chair, dean, and Provost and Vice President for Academic Affairs. In the case of the graduate students, the graduate dean also will be notified.

For complete information regarding disciplinary sanctions, appeal procedures, and hearing guidelines, refer to www.ndsu.edu/policy/335.htm.

Dean's List
To be eligible for inclusion on the Dean’s List for any given semester, a student must have earned a minimum grade-point average of 3.50 during that term while completing at least 12 semester hours (nine hours during the summer) in graded coursework using grades that carry honor points. The student may not have any grades of Incomplete for the semester. The Dean’s List is only maintained for undergraduate students and professional (Pharm.D.) students.

Academic Probation and Suspension
To be eligible to register continuously without conditions, a student must maintain good academic standing. The following scholastic standards, relative to completed credits and institutional grade-point average, determine a student’s academic standing:

- Minimum GPA
- Completed Credits
  - 1.75 (freshman) 0 - 26
  - 1.90 (sophomore) 27 - 59
  - 2.00 (junior & senior) 60 or more

Records of all students are examined at the end of each grading period. Students failing to meet the scholastic standards are subject to review by the University Committee on Academic Standards. Academic standing relates to the following:

Grading Period
NDSU has three grading periods (terms) per academic year: fall semester, spring semester, and summer session.

Grade-Point Average (GPA)
Semester or term GPA refers to the grade-point average for any given grading period. Cumulative or institutional GPA refers to the composite grade-point average for all grading periods completed at NDSU.

Academic Warning
An academic warning is to alert a student that the semester GPA for the most recent term was below the minimum required for good standing for the student’s classification. An academic warning does not appear on the official academic transcript. An academic warning is issued for the following:

1. A freshman whose institutional GPA is less than 1.75 upon the completion of the first term of residence at NDSU.
2. A student who transferred in good standing whose institutional GPA is deficient upon completion of the first term of residence at NDSU.
3. A student who has been in residence two or more terms and has an acceptable institutional GPA, but whose semester GPA is deficient.

Academic Probation
An academic probation is a formal warning that a student's institutional GPA is below minimum standards for the student’s classification. Students placed on academic probation may enroll for no more than 16 credits for the following semester or 12 credits for the following summer session without permission of the college dean. An academic probation does not appear on the student's official academic academic transcript (fall 2005 and later). An advisor hold will be placed on the student's record, and may only be removed after the student has met with his/her advisor.

Academic probation is issued for the following:

1. A student who entered the grading period in good standing and has been in residence two or more terms, but whose institutional GPA is deficient for the student’s classification.
2. A student who entered the grading period on academic warning and whose institutional GPA is deficient for the student’s classification.

Continued Probation
Continued probation is a formal extension of the initial academic probation status and is issued when the institutional GPA is still below minimum, but adequate progress is made by attaining the minimum GPA for the term for student classification. Students placed on continued academic probation may enroll for no more than 16 credits for the following semester or 12 credits for the following summer session without permission of the college dean. Continued probation does not appear on the student’s official academic transcript (fall 2005 and later). An advisor hold will be placed on the student’s record, and may only be removed after the student has met with his/her advisor.

Continued probation may be issued for the following:

A student who entered the grading period on academic probation and whose institutional GPA is still deficient for the student’s classification, but the semester GPA is at or above the minimum. A continuance may be granted to a maximum of three (3) consecutive probationary terms.

Academic Suspension
Academic suspension is issued when the academically deficient student does not demonstrate an improvement in his or her institutional GPA. Registration for the following full semester or for summer courses that do not begin prior to the start of the standard eight week session will be canceled. A student may not be considered for readmission for two grading periods following an academic suspension (includes summer). An academic suspension appears on the student's official academic transcript. Academic suspension may be issued after two or more terms in residence for the following:

1. A student who entered the grading period on either probation or continued probation whose semester GPA and institutional GPA are both deficient for the student’s classification.
2. A student who entered the grading period for a third consecutive probationary term and whose institutional GPA is still deficient for the student’s classification.

Suspension Appeals
A student who has been suspended may appeal the suspension if there were extraordinary circumstances beyond their control. Appeals must be submitted in writing at the Office of Registration and Records no later than one week prior to the semester start date (or the first day of the standard 8-week summer courses) following the imposition of suspension. Supporting documentation is required.

Suspended Students
NDSU honors suspensions of other institutions. Further, students suspended from NDSU or any other institution may not transfer coursework into NDSU that was completed during the suspension period unless prior approval, through an appeal process, has been granted. Transfer and returning students who fail to report all previous college work are subject to dismissal or loss of credit or both. Courses previously completed at NDSU may only be repeated at NDSU, with the exception of Tri-College courses (see Repeated Courses section for more details).

Readmission
To be considered for readmission, suspended students must sit out for at least two grading periods (includes summer) and file a Reopening/Petition for Readmission form to the Office of Registration and Records at least 30 days prior to the beginning of the semester in which readmission is sought. If the petition is approved by the Committee on Academic Standards, the student may register, but will be readmitted on probation. Students who have been enrolled in courses at another institution since leaving NDSU must arrange for an official transcript to be sent to the Office of Registration and Records before readmission will be considered. However, courses/grades earned from another institution during the suspension period will not be considered for transfer unless prior approval is granted through an appeals process.
Academic programs in the College of Agriculture, Food Systems, and Natural Resources open doors to exciting and rewarding opportunities. Agriculture is the foundation upon which NDSU was established in the late 1800s. Today, the college builds on that tradition with teaching, research, and outreach that improve the lives of people throughout the region and the world.

Mission and Values
The college provides relevant and challenging academic programs that prepare students to capitalize on current and future opportunities. Programs are based on fundamental sciences and technologies applied to agricultural life and environmental disciplines as well as related social and economic fields.

NDSU agriculture is taking its place as one of the nation’s leaders. Our commitment to excellence has inspired new courses of study and has built ongoing partnerships with agricultural industries and government agencies.

Demand for graduates with expertise in the college’s many disciplines continues to grow rapidly. Career opportunities for men and women are expanding into new areas made possible by new technologies and a more comprehensive global perspective.

Food safety and security, biotechnology and genetics, sustainable production and land stewardship, bio-energy and bio-products, and human/animal health are emerging sustainable production and land stewardship, bio-energy and bio-products, and human/animal health are emerging.

Career opportunities for men and women are expanding into new areas made possible by new technologies and a more comprehensive global perspective.

Food safety and security, biotechnology and genetics, sustainable production and land stewardship, bio-energy and bio-products, and human/animal health are emerging.

Interdisciplinary Studies
The college contributes strongly to interdisciplinary studies in natural resources management, food safety, logistics management, and several graduate programs. See Interdisciplinary Programs section of this Bulletin for more information.

Agricultural Education
NDSU is designated by the State Board for Career and Technical Education as the recognized institution for preparing teachers of Agricultural Education. See College of Education, section of this Bulletin for more information.

Graduation Status
Degree programs are designed for completion in four years. Graduation status review is available to students each semester after 75 credits are earned.

Graduate and Professional Schools
The college’s academic programs are excellent preparation for continued formal education in graduate school programs and in professional programs such as law schools and medicine. For more information on graduate school opportunities at NDSU see: www.ndsu.edu/gradschool.

Minors
Approved minors and/or options are available in most academic areas to help students define their academic programs.

Affiliated Programs
A major in Agricultural and Biosystems Engineering is offered by the College of Engineering and Architecture. The College of Human Development and Education offers a major in agricultural education and the College of Arts, Humanities and Social Sciences offers both a major and minor in agricultural communication.

Interdisciplinary Studies
The college contributes strongly to interdisciplinary studies in natural resources management, food safety, logistics management, and several graduate programs. See Interdisciplinary Programs section of this Bulletin for more information.

Agricultural Education
NDSU is designated by the State Board for Career and Technical Education as the recognized institution for preparing teachers of Agricultural Education. See College of Human Development and Education, School of Education, section of this Bulletin for more information.

Graduation Status
Degree programs are designed for completion in four years. Graduation status review is available to students each semester after 75 credits are earned.

Graduate and Professional Schools
The college’s academic programs are excellent preparation for continued formal education in graduate school programs and in professional programs such as law schools and medicine. For more information on graduate school opportunities at NDSU see: www.ndsu.edu/gradschool.

Honor System
A student-elected honor system recognizes the ability of students to govern themselves. The honor system, in place since 1955, provides an enhanced learning environment. All students enrolled in agriculture courses are required to uphold the honor system. (www.ag.ndsu.edu/academic/honor.htm)

Scholarships
Students in the college who have selected one of the college’s majors are eligible for scholarships through their major department and the dean’s office. Scholarships are awarded to students who have demonstrated excellence in their courses. About one-third of students in the college receive scholarships. Students are encouraged to contact their major department or the college Web site for scholarship opportunities. (www.ag.ndsu.edu.academics/coaschol.htm)

Student Organizations
Nearly 30 agriculture-related clubs and organizations provide opportunities for students to develop leadership, teamwork, interpersonal and communication skills. (www.ag.ndsu.edu/academics/studentorgs.htm)

Field Experience, Internships, Cooperative Education
Students gain practical experience and credits by enrolling in a supervised field experience (internship) offered through individual departments. Another option, offered by the Career Center, provides undergraduate and graduate students with career-enhancing experiences and academic credits through the Cooperative Education program. The number of cooperative education credits allowed for graduation varies by program, but should not exceed six for any program in the college.
International Study

The college encourages students to gain international perspectives in their studies. Besides study abroad, students might consider adding the international studies major to their program in the college. Additional information is available from departmental offices or through the university’s Office of International Programs.

General Agriculture Major

The degree program in General Agriculture is designed to serve students who wish to pursue a college education in a broad area of agriculture or who want to tailor a program to meet their specific career objectives. Traditionally, students interested in careers focusing on agricultural production follow this program of study.

Students electing to graduate with a General Agriculture major must file a “plan of study” with the General Agriculture Coordinating Committee by the third week of the second semester of the junior year. This plan of study must include a “statement of goals” or why a tailored degree is desired and an outline of courses to be taken to meet their stated career goals. Identification of the capstone course and any internship that the student plans to take also is to be included in the plan of study.

Sample '08-'09 Curriculum

General Agriculture Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>AGRI 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1101, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 320, Business &amp; Prof Writing</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>CHEM 121, 121L, Gen Chem I</td>
<td>3, 1</td>
</tr>
<tr>
<td>PLSC 315, Genetics</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 114, Microcomputer Packages or CSCI 116, Business Use of Comput..</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discipline Area Courses</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI 150, Ag Orientation</td>
<td>1</td>
</tr>
<tr>
<td>MATH 103, College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Math/Science Electives</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture Electives</td>
<td>12</td>
</tr>
<tr>
<td>Free Electives (for degree completion)</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
</tr>
</tbody>
</table>

Curriculum Total                128

1. Students majoring in Agriculture, Food Systems, and Natural Resources. A minimum of eight credits must be taken at NDSU.

Sample '08-'09 Curriculum

General Agriculture Minor

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discipline Area Courses</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
</tr>
</tbody>
</table>

1. Refer to department or curriculum guide for course options.

Department of Agribusiness and Applied Economics

www.ndsu.edu/agecon

programs in agribusiness and agricultural economics apply economic principles to the use of private and public resources to provide a safe and affordable food supply, to maintain a sustainable agricultural and natural resource base, and to manage natural and environmental resources for current and future generations. Students in economics develop a solid foundation for analyzing how a society solves such problems as what goods and services to produce, how to organize production, and for whom goods and services are to be produced.

As the global population grows and the world’s economies become more interdependent, economic principles become increasingly important for problems facing the agribusiness industry. Students interested in careers in agribusiness have several options. Beginning in their sophomore year, students take courses in management, marketing, and finance, all concentrating on the unique aspects of food system economics. Specialization in upper division courses permits students to concentrate in areas of particular interest: management, finance, or marketing.

Students in Agricultural Economics may focus on management, finance, and marketing in agriculture and food systems. However, the Agricultural Economics program allows students greater flexibility in selecting courses best fitting their career objectives and personal interests. This major requires a broader background in the agricultural sciences, with courses from other departments in the College of Agriculture, Food Systems, and Natural Resources providing students the scientific basis for applying economic concepts to decision problems in food systems. The Agricultural Economics major is ideally suited for students with career objectives in production agriculture, in farm and natural resource policy analysis, or in industries providing service to agriculture.

Besides being invaluable for understanding contemporary political, economic, and social issues, students majoring in Economics are well prepared for careers in business, law, education, public administration, and research. The Economics major is in high demand, as employers recognize the need to understand global trends in order to contribute to private and public economic decisions. Economics courses cover a wide range of applications and theory in managerial economics, labor markets, economic development, micro- and macroeconomics, market structure, natural resources and environmental economics, and globalization and trade.

The department offers minors in Economics and in Agribusiness.

Curriculum Options

The Department of Agribusiness and Applied Economics offers three majors: (1) Agribusiness, (2) Agricultural Economics, and (3) Economics.

Agribusiness Major

Students choose one of three areas of specialization:

Management: This option provides students with a broad background, preparing them for general career alternatives in agribusiness.

Finance: This option prepares students for careers in agribusiness finance, agricultural lending, financial institution management, accounting, insurance, and investment.

Marketing: This option prepares students for careers in agricultural marketing, sales, or food product marketing.

In the Agribusiness program:

1. Students are exposed to a range of methods useful in agribusiness decision-making. Agribusiness graduates will master problem-solving skills to face challenges likely to be encountered in their professional careers.

2. Agribusiness students are required to participate in an internship during their studies. Employers continue to place high importance on work-related experience when they evaluate potential employees. Employers are assured that all NDSU Agribusiness graduates have gained this valuable work experience through the required internship.

3. Collaboration with the College of Business leads to the concurrent satisfaction of one of the minors offered by the College of Business. Students may select business courses for the minor that complement their agribusiness interests.

Sample '08-'09 Curriculum

Agribusiness Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>AGRI 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1101, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 110, Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>STAT 330, Intro Stats</td>
<td>3</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGEC 242, Intro to Agricultural Mgmt</td>
<td>4</td>
</tr>
<tr>
<td>AGEC 244, Agricultural Marketing</td>
<td>3</td>
</tr>
<tr>
<td>AGEC 246, Intro to Agricultural Finance I</td>
<td>4</td>
</tr>
<tr>
<td>AGEC 339, Quant Meth &amp; Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>ECON 341, Intermediate Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 343, Intermediate Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>AGEC 344, Agriculture Price Analysis</td>
<td>3</td>
</tr>
<tr>
<td>AGEC 346, Applied Risk Analysis</td>
<td>3</td>
</tr>
<tr>
<td>AGEC 445, Agribusiness Industrial Strategy</td>
<td>3</td>
</tr>
<tr>
<td>AGEC 491, Seminar (Capstone Course)</td>
<td>1</td>
</tr>
<tr>
<td>AGEC 496, Internship</td>
<td>2</td>
</tr>
<tr>
<td>ACCT 200, Elements of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 201, Elements of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>Science/Tech/Ag Electives</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
</tr>
</tbody>
</table>
Additional Requirements
AGRI 150, Ag Orientation ........................................ 1
COMM Electives .................................................. 3
MATH 146, Applied Calculus I ............................... 4
STAT 331, Regression Analysis or
ECON 410, Intro to Econometrics ......................... 2 or 3
Free Electives (for degree completion) ..................... 24-25
Total ............................................................... 34-36

Curriculum Total .................................................. 128

Sample '08-09 Curriculum

Agribusiness Minor
The Agribusiness minor is a two-track minor (Agribusiness and Corporate Agribusiness) that exposes students to applications of fundamental business concepts in an agricultural or food systems setting. The Agribusiness track is a 17 credit minor that primarily draws on courses in Agribusiness and Agricultural Economics and emphasizes Agribusiness applications throughout its curriculum. The Corporate Agribusiness track is a 21 credit minor that emphasizes principles and courses applicable to corporate business. The Corporate Agribusiness track is restricted to students whose major is in the College of Agriculture, Food Systems, and Natural Resources. The Agribusiness track is open to all NDSU majors. A minimum of eight credits must be taken at NDSU.

Sample '08-09 Curriculum

Agribusiness Minor: Agribusiness Track

Requirements
Credits
ECON 201, Prin of Microeconomics .......................... 3
AGEC 242, Intro to Agricultural Management ............. 4
AGEC 244, Agricultural Marketing ........................... 3
AGEC 246, Intro to Agricultural Finance I ................. 4
Ag/Applied Econ Electives ............................... 3-5

Total ............................................................... 17

Curriculum Total .................................................. 17

1 Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum

Agribusiness Minor: Corporate Agribusiness Track

Requirements
Credits
ECON 201, Prin of Microeconomics .......................... 3
ACCT 102, Fund of Accounting ............................... 3
BUSN 340, Prin of Finance .................................... 3
BUSN 250, Foundations of Mgmt. ......................... 3
BUSN 360, Foundations of Marketing ...................... 3
Ag/Applied Econ Electives ............................... 3-5
Mgmt./Marketing/Finance Electives .......................... 3

Total ............................................................... 21

Curriculum Total .................................................. 21

1 Refer to department or curriculum guide for course options.

Agricultural Economics Major
Core requirements in the Agricultural Economics major include introductory courses in agricultural management, finance, and marketing. Students may choose to take all of the advanced courses in the department, yet flexibility allows building a program based on a student’s individual career goals. A total of 10 courses must be taken in agribusiness or agricultural economics, plus four additional courses in micro- and macroeconomics.

Sample '08-09 Curriculum

Agricultural Economics Major

General Education Requirements
Credits
First Year Experience (F):
AGRI 189, Skills for Academic Success .................. 1
Communications (C):
COMM 110, Fund of Public Speaking .................... 3
ENGL 110I, 120, College Comp. I, II ........................ 3, 3
ENGL Upper Level Writing Course ........................ 3
Quantitative Reasoning (R):
STAT 330, Intro Stats ........................................ 3
Science & Technology (S) ..................................... 10
Humanities & Fine Arts (A) .................................. 6
Social & Behavioral Sciences (B) .......................... 6

Total ............................................................... 40

Major Requirements
Credits
AGEC 242, Intro to Agri Management ..................... 4
AGEC 244, Agricultural Marketing ........................ 3
AGEC 246, Intro to Agricultural Finance I ................. 4
AGEC 339, Quant Mth. & Decision Making .............. 3
AGEC 342, Farm & Agribusiness Mgmt II or
AGEC 344, Agricultural Price Analysis or
AGEC 346, Applied Risk Analysis .......................... 3
AGEC 375, Applied Agricultural Law or
AGEC 484, Agricultural Policy ............................. 3
ECON 341, Intermediate Microeconomics ............... 3
ECON 324, Money and Banking or
ECON 343, Intermediate Macroeconomics ............ 3
ACCT 102, Fundamentals of Accounting or
ACCT 200, Elements of Accounting I and
ACCT 201, Elements of Accounting II ................... 3 or 6
Agribusiness & Applied Econ Electives ........................ 9
Science/Tech, Agriculture Electives ........................ 9
Capstone Experience ............................................. 3

Total ............................................................... 50-53

Additional Requirements
Credits
AGRI 150, Ag Orientation ........................................ 1
COMM Electives .................................................. 3
MATH 146, Applied Calculus I ............................... 4
STAT 331, Regression Analysis or
ECON 410, Intro to Econometrics ......................... 2 or 3
Free Electives (for degree completion) ..................... 25-28

Total ............................................................... 35-39

Curriculum Total .................................................. 128

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for ENGL 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110
2 Refer to department or curriculum guide for course options.
3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech Gen Ed courses.

Economics Major
Economics is the social science that deals with problems of scarcity. Economics provides a systematic and logical framework for analyzing how a society solves such problems as what goods and services to produce, how to organize production, and for whom goods and services are to be produced. Knowledge of economics is necessary for understanding and dealing with such topics as inflation, unemployment, international trade and monetary systems, economic growth, government finance, and various forms of market regulation. Besides being important for understanding contemporary political, economic, and social issues, economics is invaluable in developing career skills for business, law, teaching, public administration, and research. Both verbal and mathematical training are involved in learning economics.

Degree Programs
Undergraduate students majoring in economics may choose either the Bachelor of Arts degree or the Bachelor of Science degree. During the freshman year, both programs require courses such as English, mathematics, and science. Introductory courses in economics include (a) microeconomics, which is the study of relative prices, the consequences of different market forms, and consumer behavior, (b) macroeconomics, which includes study of the general level of prices, employment, and output.

Areas of specialization may emphasize such fields as money and banking, international economics, labor, industrial organization, environmental and resource economics, or public finance.

Requirements for the Bachelor of Arts degree include two years of one foreign language. For the Bachelor of Science degree, students are required to select a minor of study from another discipline.

Career Choices
Economics majors are employed in virtually every area of the economy. In banks and financial institutions they forecast market activity, exchange rates, and interest rate movements. In industrial firms they forecast sales, evaluate changes in cost conditions, analyze changes in international economic conditions, and provide data needed for critical decisions.

Governments are among the largest employers of economists because agencies rely on the skills of these professionals to evaluate proposed projects and policies and review tax policies. Virtually no other academic major offers the diversity in employment opportunities and flexibility among careers, as does the study of economics.

A background in economics provides students with a set of versatile skills that will not become outdated with introduction of new technology.

Sample '08-09 Curriculum

Economics Major

General Education Requirements
Credits
First Year Experience (F):
AGRI 189, Skills for Academic Success .................. 1
Communications (C):
COMM 110, Fund of Public Speaking .................... 3
ENGL 110I, 120, College Comp. I, II ........................ 3, 3
ENGL Upper Level Writing Course ........................ 3
Quantitative Reasoning (R):
STAT 330, Intro Stats ........................................ 3
Science & Technology (S) ..................................... 10
Including: CSCI 114, Microcomputer Pkgs or
CSCI 116, Business Use of Computers
Humanities & Fine Arts (A) .................................. 6
Social & Behavioral Sciences (B) .......................... 6
(satisfied with major requirements)
Wellness (W) .................................................. 2
Cultural Diversity (D) ......................................... --
Global Perspective (G) ........................................ 40

ECON 201, Prin of Macroeconomics .................. 3

Total ......................................................... 60

Major Requirements

ECON 201, Prin of Microeconomics .................. 3

ECON 202, Prin of Macroeconomics .................. 3

ECON 341, Intermediate Microeconomics .......... 3

ECON 434, Intermediate Macroeconomics .......... 3

ECON 491, Seminar (Capstone Course) ............ 1

ECON Electives 1 ........................................... 15

Total ......................................................... 28

Related Requirements

MATH 146, Applied Calculus I .......................... 4

STAT 331, Regression Analysis ......................... 3

ECON 410, Intro to Econometrics ....................... 2 or 3

Additional Arts/Humanities Electives ................. 3

Additional Social & Behavioral Sci Electives ...... 6

Minor/Electives (for degree completion) .......... 44-45

Total ......................................................... 60

Curriculum Total ........................................ 128

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received).

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Sciences, and/or Science & Tech Gen Ed courses.

Economics Minor

The minor in Economics complements many other majors by helping the student develop an analytical approach to understanding human events from the perspective of this discipline.

Sample ’08-09 Curriculum

Economics Minor

Requirements

ECON 201, Prin of Microeconomics .................. 3

ECON 202, Prin of Macroeconomics .................. 3

ECON 341, Intermediate Microeconomics.......... 3

BUSN 451, Managerial Economics ................... 3 or 4

ECON 434, Intermediate Macroeconomics .......... 3

ECON Electives 1 ........................................... 5-6

Total ......................................................... 18

1 Refer to department or curriculum guide for course options.

Department of Agricultural and Biosystems Engineering

www.ageng.ndsu.nodak.edu

Agricultural Systems Management Major

The Agricultural Systems Management (ASM) program combines an understanding of the agricultural, biological, and physical sciences with economics, managerial, and technical skills. This understanding of science, systems management, and applications engineering can be applied to a career in the production and processing of food, feed, fiber, and fuel, and the marketing, sales, and distribution of agricultural products and services. Students focus on the application of engineering designs, the study of technology used in agriculture, and the integration of business management concepts in the agricultural, food, and closely related industries. Students complete courses in machinery principles, off-road power systems, precision agriculture, commodity handling and processing, natural resources management, electrical and electronic systems, and information and decision support technology.

Taking courses in accounting, economics, marketing, management, business law, sales, and finance develops a strong business background. Personal career objectives may be pursued through specialization in areas such as agribusiness and production agriculture. Students are encouraged to minor in agribusiness, business administration, communications, or another agricultural discipline.

Agricultural Systems Management graduates are often employed in positions that provide the link between the researcher, designer, engineer, manufacturer, and the consumer. Employers include: 1) companies and agencies that provide inputs, products, and services for agricultural production; 2) companies or agencies in the business of handling, storing, processing, and distributing agricultural products/commodities and processed food or non-food products; and 3) companies and agencies that supply physical and business services to rural and urban communities. This degree is ideal for those interested in careers in technical sales or management of an agriculture-related business involved in production, processing, or manufacturing. Graduates of the program are frequently self-employed as owners/operators of commercial farms, ranches, and businesses. They are often also employed as crop consultants or production specialists. The flexibility of the program allows students the opportunity to tailor the curriculum to complement their career goals.

Students interested in the innovation, design, testing, manufacturing, and development aspects of products, processes, or systems for agricultural production, food, and value-added processing of commodities, or sustainable management of environmental resources should consider the Agricultural and Biosystems Engineering curriculum in the College of Engineering and Architecture.

Sample ’08-09 Curriculum

Agriculture Systems Management Major

General Education Requirements

First Year Experience (F):

ABEN 189, Skills for Academic Success ........... 1

Communications (C):

COMM 110, Fund of Public Speaking ................. 3

ENGL 1101, 120, College Comp I, II ................ 3, 3

ENGL Upper Level Writing Course 2 ................. 3

Quantitative Reasoning (R):

STAT 330, Intro Stats .................................. 3

Science & Technology (S):

CHEM 121, Gen Chem I .................................. 3

CHEM 122, Gen Chem II ................................ 3

Phys 211, 211L, College Physics I, lab ............... 3, 3

Humanities & Fine Arts (A) ................................ 6

Social & Behavioral Sciences (B):

ECON 201, Prin of Microeconomics .................. 3

ECON 202, Prin of Macroeconomics ................. 3

Wellness (W) ................................................. 2

Cultural Diversity (D) 3 ................................. 2

Global Perspective (G) .................................. 40

ECON 201, Prin of Microeconomics ................. 3

Total ......................................................... 40

Major Requirements

ASM 115, Fund of ASM .................................. 3

ASM 125, Fabrication & Construction Tech .......... 3

ASM 222, Computer Applications in ASM .......... 3

ASM 264, Natural Resource Mgt Systems ........... 3

ASM 323, Post Harvest Technology ................... 3

ASM 354, Electricity & Electronic Apples .......... 3

ASM 373, 374, Tractors & Power Units, Lab ......... 3, 3

ASM 378, Machinery Principles & Mgt ............... 3

ASM 429, Hydraulic Power Prin & Appl ............. 3

ASM 454, Prin of Site Specific Agriculture ........... 3

ASM 475, Mgt of Agri Syst (Capstone) ............... 2

ASM 491, Seminar ....................................... 1

ASM 496, Field Experience (Expo) .................... 1

Total ......................................................... 35

Additional Requirements

ACCT 102, Fundamentals of Accounting .......... 3

ACCT 201, Elements of Accounting I .............. 3

ACCT 201, Elements of Accounting II ............... 3-6

AGRI 150, Ag Orientation ............................. 1

CSCI 114, Microcomputer Packaging ............... 3

CSCI 116, Busn Use of Computers .................... 3 or 4

MATH 103, College Algebra ............................ 3

MATH 105, Trigonometry or higher ................. 3

PSYC 111, Intro to Psychology ......................... 3

Agricultural Electives 2 ................................ 12

Specialization/Minor Electives 2 ....................... 16

Free Electives (for degree completion) ............... 5-9

Total ......................................................... 53

Curriculum Total ........................................ 128

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received).

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Sciences, and/or Science & Tech Gen Ed courses.

4 ACCT 200, Elements of Accounting (3cr) & ACCT 201 (3cr). Elements of Accr II are required for the Degree Management option.

Curriculum Options

Agriculture or Business Administration (16)

Students select courses in agribusiness, business, and related areas to achieve career goals in agricultural and related business areas.

A Dealer Management Specialization within the business option is available. This specialization is designed for students who want careers as equipment dealership managers or with equipment manufacturers. Technology, agribusiness, and communication are emphasized. Requirements include a minor in agribusiness, or business administration and two paid internships with equipment dealerships. Several industry scholarships are available to students enrolled in this specialization.

Production Agriculture (16)

Students select courses in agricultural sciences and supporting areas to achieve career goals in the technical and management aspects of production agriculture systems.

Agricultural/Industrial Equipment Option

North Dakota State University and North Dakota State College of Science (NDSCS) collaboratively offer the Ag/Industrial Equipment Option in the Agricultural Systems Management program. This collaboration gives students primary experience in physical science, engineering technology, and machinery systems with complementary hands-on training in mechanized systems laboratories at NDSCS. Students complete their education at NDSU in agricultural systems management and complement their program by selecting a business specialization or minor emphasizing courses in management, sales, marketing, finance, and personnel management. Completion of one or more cooperative education or internship placements in the equipment industry also is required.

Potential positions available for graduates in this option include: salesperson, service manager, parts and inventory control manager, sales manager, territory service manager, finance manager, general manager, regional marketing representative, manufacturer’s representative, district sales manager, and warranty manager.
### Sample '08-09 Curriculum

#### Agricultural/Industrial Equipment Option

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110, 120, College Composition I, II</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>MATH 103, College Algebra</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH 105, Trigonometry</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ECON 201, 202, Micro &amp; Macroeconomics</td>
<td>3, 3</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>TECH 121, Engine Fund</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>DTEC 122, Preventive Main/Power Trains</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>DTEC 101, Electrical Systems</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>DTEC 112, Intro to Diesel Engines</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CSCI 101, Computer Literacy</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
<td></td>
</tr>
</tbody>
</table>

1. The remaining curriculum is taken at NDSU in the Animal Science major.

#### Agricultural Systems Management Minor

A minor in Agricultural Systems Management is available to students from other majors by working with department faculty to select 16 credits in Agricultural Systems Management. A minimum of eight credits must be taken at NDSU.

#### Sample '08-09 Curriculum

##### Agricultural Systems Management Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASM 264, Natural Resource Mgt Systems</td>
<td>3</td>
</tr>
<tr>
<td>ASM 354, Electricity &amp; Electronic Appl</td>
<td>3</td>
</tr>
<tr>
<td>ASM 373, Tractors &amp; Power Units or</td>
<td></td>
</tr>
<tr>
<td>ASM 378, Machinery Principles &amp; Mgt</td>
<td>2</td>
</tr>
<tr>
<td>ASM Electives</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

1. Refer to department or curriculum guide for course options.

#### Department of Animal Science

[www.ag.ndsu.nodak.edu/ars/templates/indexes/programindex.htm](http://www.ag.ndsu.nodak.edu/ars/templates/indexes/programindex.htm)

### Animal Science Major

The Animal Science program offers students the ability to obtain an understanding of the “big picture” of animal agriculture including courses that emphasize animal anatomy and physiology, nutrition, livestock production systems, agricultural business and marketing, and factors influencing product quality in a friendly environment that encourages learning opportunities outside of the classroom. The Animal Science faculty and staff are dedicated to providing students with the background information, as well as up to date information regarding the latest techniques in animal production and business insight, animal handling and husbandry, and laboratory skills.

Besides taking the required courses necessary for the Animal Science major, students have the opportunity to complete coursework that helps meet their specific career goals. Internships are encouraged to obtain specific skills and develop contacts necessary for success after graduation.

Students graduating with a major in Animal Science are accepted in professional schools including veterinary school, and graduate programs specializing in nutrition, physiology, meat science, biotechnology, and microbiology. Graduates from the Animal Science program are highly competitive for careers in agribusiness, management for livestock production systems, livestock media and public relations, technical positions in many aspects of animal agriculture, as well as leaders in livestock production on farms and ranches.

### Curriculum Options

Two options, each designed to strengthen career preparation, are available:

#### Production/Business

This option is for students interested in careers associated with the production, agribusiness, and management of animals and the products they produce.

#### Science/Pre-Vet

This option is designed for students who are interested in specific careers that require advanced course work in the biological sciences to meet the requirements for veterinary school, graduate school programs, or advanced technical programs. It also is designed to prepare students for graduate study or to provide an animal-oriented degree while meeting the course requirements for veterinary schools.

### Transfer credits:

Transfer courses with grade C or better only will be accepted for Animal and Range Sciences courses in the major.

### Major:

All Animal Science majors must meet the following requirements.

#### Sample '08-09 Curriculum

##### Animal Science Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>- COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>- ENGL 110 I, 202, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>- ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>- STAT 330, Intro Stats</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>- CHEM 121, 121L, Gen Chemistry I, Lab</td>
<td>3, 3</td>
</tr>
<tr>
<td>- PLSC 110, World Food Crops</td>
<td>3</td>
</tr>
<tr>
<td>- PLSC 315, Genetics</td>
<td>3</td>
</tr>
<tr>
<td>- Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>- Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>- Including: ECON 201, Prin of Microeconomics</td>
<td>3, 3</td>
</tr>
<tr>
<td>- Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>- Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>- Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td>- ECON 201, Prin of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

#### Major Requirements

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>AGEC 242, Intro to Agricultural Mgmt</td>
<td>4</td>
</tr>
<tr>
<td>AGEC 244, Agricultural Marketing</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 114, Intro to Animal Science</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 123, Feeds &amp; Feeding</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 220, Livestock Production</td>
<td>4</td>
</tr>
<tr>
<td>ANSC 222, Meat Animal Evaluation</td>
<td>2</td>
</tr>
<tr>
<td>ANSC 320, Dairy Cattle Selection or</td>
<td>3</td>
</tr>
<tr>
<td>- ANSC 330, Meat Selection, Grading, Judging</td>
<td></td>
</tr>
<tr>
<td>- or ANSC 331, Livestock Selection</td>
<td>1-2</td>
</tr>
<tr>
<td>ANSC 323, Fund of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>RNG 336, Intro to Range Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 357, Animal Genetics</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 463, 463L, Phisio of Reprod, Lab</td>
<td>3, 1</td>
</tr>
<tr>
<td>ANSC 470, Applied Nutrition</td>
<td>4</td>
</tr>
<tr>
<td>ANSC 491, Seminar</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 150, Gen Biology I</td>
<td>3</td>
</tr>
<tr>
<td>MIRC 202, 202L, Intro to Microbiology, Lab</td>
<td>2, 1</td>
</tr>
<tr>
<td>CHEM 260, Elements of Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>MATH 103, College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>VETS 135, Anat &amp; Phys of Domestic Animals</td>
<td>3</td>
</tr>
<tr>
<td>ANSC Electives</td>
<td>4-5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>59</strong></td>
</tr>
</tbody>
</table>

### Option Choices:

#### Option 1: Production/Business

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICR 465, Fundamentals of Animal Disease</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Animal Production Electives</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Option 2: Science/Pre-Vet

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 240, Survey of Organic Chem</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Natural/Physical Science/Math Electives</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Animal Production Electives</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Curriculum Total

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 110 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2. Refer to department or curriculum guide for course options.


#### Sample '08-09 Curriculum

##### Animal Science Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC 114, Intro to Animal Science</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 123, Feeds &amp; Feeding</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 220, Livestock Production</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 222, Meat Animal Evaluation</td>
<td>2</td>
</tr>
<tr>
<td>ANSC/RNG Electives</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

1. Refer to department or curriculum guide for course options.

#### Equine Studies Major

The Equine Studies major is designed to prepare students for careers in the equine industry and related fields. Course work includes practical husbandry and equitation skills, scientific principles related to management of the equine, and study of the modern equine industry and business practices.

#### Sample '08-09 Curriculum

##### Equine Studies Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>- COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>- ENGL 110 I, 202, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>- ENGL 320, Business &amp; Profess Writing</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>- STAT 330, Intro Stats</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>- CHEM 121, 121L, Gen Chemistry I, Lab</td>
<td>3, 3</td>
</tr>
<tr>
<td>- MICR 202, 202L, Intro to Microbiol, Lab</td>
<td>2, 1</td>
</tr>
<tr>
<td>- BIOL 150, Gen Biology I</td>
<td>3</td>
</tr>
<tr>
<td>- Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>- Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>- Including: ECON 201, Prin of Microeconomics</td>
<td>3, 3</td>
</tr>
<tr>
<td>- Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>- Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>- Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td>- ECON 201, Prin of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>
Major Requirements

ANSC 123, Feeds & Feeding ........................................ 3
ANSC 260, Intro to Equine Studies ................................ 2
ANSC 260L, Equine Care & Mgmt Practicum .................. 1
ANSC 261, Basic Equitation & Horsemanship ................. 1
ANSC 357, Animal Genetics ......................................... 3
ANSC 360, Equine Nutrition ......................................... 3
ANSC 364, Equine Anatomy & Physiology .................... 3
ANSC 365, Equine Evaluation ...................................... 2
ANSC 480, Equine Industry & Prod Sys .......................... 3
ANSC 491, Seminar .................................................. 1
ANSC 494, Internship ............................................... 2
RNG 336, Intro to Range Mgmt .................................... 3
ANSC/ZOO 463, Phys of Reproduction ........................... 3
ANSC/ZOO 463L, Phys of Reproduction Lab ................. 1
ANSC Electives1 ...................................................... 5

Total ................................................................. 36

Related Requirements

AGEC 242, Intro to Agricultural Management .................. 4
AGEC 244, Agricultural Marketing ............................. 3
AGRI 150, Ag Orientation ......................................... 1
CHEM 260, Elements of Biochemistry .......................... 4
MATH 103, College Algebra ....................................... 3
MICR 465, Fund of Animal Disease .......................... 3
PLSC 110, World Food Crops .................................... 3
PLSC 315, Genetics ................................................ 3
VETS 131, Anet & Phys of Domestic Animals ......... 3
VETS Electives (to complete 128 credits) .................... 25

Total ................................................................. 52

Curriculum Total .................................................. 128

1 Refer to department or curriculum guide for course options.

Veterinary Technology Major

http://vettech.ndsu.nodak.edu

Veterinary Technology is an exciting and challenging major that offers a multitude of career opportunities in animal health care and related areas. The Veterinary Technology major leads to the B.S. degree. This major offers a well-rounded program of general and clinical studies. Graduates are prepared not only for traditional veterinary practice careers, but also for pursuit of emerging non-traditional careers through the choice of electives and minor areas of study.

The first pre-professional year of the Veterinary Technology program is open to all interested students and offers an opportunity to explore the veterinary technology field. Advancement into the professional program in the second year is limited to a maximum of 28 students who are selected on a competitive basis.

The American Veterinary Medical Association accredits the Veterinary Technology program.

Sample '08-'09 Curriculum

Veterinary Technology Major

General Education Requirements

First Year Experience (F):
- AGRI 189, Skills for Academic Success ...................... 1
- Communications (C):
  - COMM 110, Fund of Public Speaking .................... 3
- ENGL 110, 120, College Comp I, II .......................... 3,3
- ENGL 320, Business & Profess Writing .................... 3
- Quantitative Reasoning (R):
  - MATH 104, Finite Math or higher ....................... 3
- Science & Technology (S):
  - MICR 202, 202L, Intro to Microbio, Lab ............. 2,1
  - CSCI 114, Microcomputer Pkgs or
  - CSCI 116, Busn Use of Computers ...................... 3 or 4
- Humanities & Fine Arts (A):
  - Social & Behavioral Sciences (B) ....................... 6
  - Wellness (W) .............................................. 2
- Cultural Diversity (D) .....................................
  - Global Perspective (G) ...................................

Total ................................................................. 40

Major Requirements

VETS 115, Medical Terminology ................................ 1
VETS 125, Animal Restraint ...................................... 2
VETS 130, Companion Animal Breeds ......................... 1
VETS 135, Anet & Phys of Domestic Animals ............. 3
VETS 136, Anet & Phys Lab .................................... 1
VETS 150, Intro to the Vet Profession ......................... 1
VETS 440, Zoonzones .......................................... 3
VETS 255, Fund of Vet Radiography3 .........................
VETS 256, Vet Clinical Tech. & Instruments3 .......... 4
VETS 259, Small Animal Diseases3 .......................... 2
VETS 357, Vet Pharmacology ................................ 3
VETS 358, Vet Surg Nurs Tech3 .............................. 4
VETS 359, Vet Hosp Info & Procedures3 .................... 2
VETS 385, Vet Clin Pathology I ............................... 3
VETS 386, Vet Clin Pathology II ............................. 3
VETS 387, Vet Clin Pathology III ........................... 3
VETS 481, Ward Care/Clinic Care3 ......................... 4
VETS 483, Clinical Veterinary Practicum3 .................. 4
VETS 485, Vet Tech Extenship3 ............................. 6

Total ................................................................. 53

Related Requirements

ANSC 114, Intro to Animal Science ........................... 3
BIOL 150, 150L, Gen Biology I, Lab or
  - BIOL 151, 151L, Gen Biology II, Lab ................. 3,1
CHEM 121, 121L, Gen Chem I, Lab or
  - CHEM 117, 117L, Chem Concept/App. Lab ........... 3,1
MICR 465, Fund of Animal Disease .......................... 3

Total ................................................................. 14

Additional Requirements

Free Electives (for degree completion) ......................

Total ................................................................. 21

Curriculum Total .................................................. 128

1 Refer to department or curriculum guide for course options.

Large Animal Veterinary Technology Minor

The minor in Large Animal Veterinary Technology is reserved for Veterinary Technology majors only. Students may earn this minor by completing a minimum of 16 credits in the following courses. A minimum of eight credits must be taken at NDSU.

Sample '08-'09 Curriculum

Large Animal Veterinary Technology Minor

Requirements

ANSC 123, Feeds & Feeding ....................................... 3
ANSC 220, Livestock Production ................................ 3
ANSC 260, Intro to Equine Studies ............................ 2
VETS 482, Large Animal Techniques ......................... 3
ANSC Electives1 .................................................. 5

Curriculum Total .................................................. 16

1 Refer to department or curriculum guide for course options.

Interdisciplinary Program in Biotechnology

www.ag.ndsu.nodak.edu/plantsci

Biotechnology is an interdisciplinary field based on a combination of biology and technology. It includes the application of science and technology to the design of new plants, animals, and microorganisms that have improved characteristics. For further information, refer to the Interdisciplinary Programs section of this Bulletin for more information.

Department of Cereal and Food Sciences

www.ndsu.edu/cereal-science

Food Science Major

The Food Science program is offered through the Department of Cereal and Food Sciences in the College of Agriculture, Food Systems, and Natural Resources. It is designed to prepare students for a career in the food industry, the "world's largest industry," which is responsible for feeding the world.

The program is structured to develop an understanding of the nature, properties, and characteristics of foods through foundation courses in biochemistry, chemistry, microbiology, physics, and other sciences. Food science courses are built on this foundation. Applications include the study of food safety, processing, preservation, sanitation, storage, and marketing of foods. The analysis and microbiological and biochemical characterization of food products are also studied. Additional elective courses in economics and business administration are available to students intending to enter a management career.

Note: Transfer credits in food science from other institutions must have grades of C or better to be accepted for the food science program at NDSU. The Institute of Food Technologists (IFT) approves the curriculum in the food science program. Students majoring in food science, therefore, are eligible to compete for the prestigious IFT scholarships.
Sample ’08-09 Curriculum
Food Science Major

First Year Experience (F):
AGRI 189, Skills for Academic Success .............. 1

Communications (C):
COMM 110, Fund of Public Speaking .................. 3
ENGL 110*, 120, College Comp I, II .................. 3, 3
ENGL Upper Level Writing Course2 .................. 3

Quantitative Reasoning (R):
STAT 330, Intro Stats .................................. 3

Science & Technology (S):
BIOL 150, Gen Biology I .............................. 3
CHEM 121, 121L, Gen Chemistry I, Lab .............. 3, 1
CSCI 114, Microcomputer Applications or CSCI 116, Busn Use of Computers .............. 3 or 4

First Year Experience (F):
sampling, refer to the Interdisciplinary Programs section.

Students who complete English 120 with a C or higher will receive credit for
AGRI 189, Skills for Academic Success . . . . . . . . . . . . .1

Sample ’08-09 Curriculum
Range Science Major

Food Safety (SAFE) Major
A number of undergraduate and graduate programs of study are offered through the Great Plains Institute for Food Safety. Food safety is an area of concern for many Americans, the current target of tremendous interest, effort, and spending worldwide, and an area in which shortages of expertise are manifest. For further information, refer to the Interdisciplinary Programs section of this Bulletin.

Great Plains Institute of Food Safety
www.ndsu.edu/foodsafety

Entomology
www.ndsu.edu/entomology

Entomology, or the study of insects, provides a wide array of topics to study. The number of insect species outnumbers all other animal groups combined and affects humans, plants, animals, and the environment in a multitude of ways, some good, some bad. Many insect species attack our crops and our domestic animals, often vectoring diseases along with the physical damage they cause. Many species are beneficial in providing food (e.g. honey), pollination services, and many are biological control agents for noxious weeds and other insect pests. Areas of study within entomology range from the very basic (systematics and conservation ecology) to the very applied (insect pest management of regional crops). Professional career opportunities include positions within academia, private research companies, the government, and conservation organizations. The Entomology Department at NDSU does not offer a formal undergraduate degree, but several courses (General Entomology, Crop Entomology, Horticulture Entomology, and Introduction to Insect Ecology) are available to interested students. Graduate programs emphasize a core curriculum (Ecology, Morphology, Physiology, and Systematics), and agricultural courses (Biological Control, Host Plant Resistance, and Insect-Pest Management).

Sample ’08-09 Curriculum
Range Science Major

General Education Requirements  Credits
First Year Experience (F):
AGRI 189, Skills for Academic Success .............. 1

Communications (C):
COMM 110, Fund of Public Speaking .................. 3
ENGL 110*, 120, College Comp I, II .................. 3, 3
ENGL Upper Level Writing Course2 .................. 3

Quantitative Reasoning (R):
STAT 330, Intro Stats .................................. 3

Science & Technology (S):
CSCI 114, Microcomputer Applications or CSCI 116, Busn Use of Computers .............. 3 or 4

First Year Experience (F):
Cultural Diversity (D)3 ................................ --

Global Perspective (G) ................................ --

ECON 201, Prin of Microeconomics ................. 3

Total .......................................................... 40

Major Requirements Credits
AGRI 150, Agricultural Orientation .................... 1
ANSC 340, Meat Science & Technology ............... 3
CFS 210, Intro to Food Sci & Tech ..................... 2
CFS 370, Food Processing I ............................ 3
CFS 450, Cereal Technology ............................ 3
CFS/MICR 453, Food & Dairy Microbiology .......... 3
CFS 460, 461, Food Chemistry, Lab .................... 3, 1
CFS 464, Food Analysis .................................. 3
CFS 470, 471, Food Processing II, Lab .................. 3, 1
CFS 474, Sensory Science ............................... 2
CFS 480, Food Product Development ................... 3
SAFE/CFS/AGED 452, Food Laws & Regul ........... 3

Total .......................................................... 37

Related Requirements Credits
BIOC 460, Biochemistry .................................. 4
CHEM 122, 122L, General Chemistry II, Lab ........... 3, 1
CHEM 341, 341L, Organic Chemistry I, Lab ........... 3, 1
MATH 146, Applied Calculus I or MATH 165, Calculus I .................. 4
MICR 350, 350L, General Microbiol, Lab .......... 3, 1
PHYS 211, 211L, College Physics I, Lab ............... 3, 1

Total .......................................................... 24

Additional Requirements Credits
Free Electives (for degree completion) ................. 26-27

Total .......................................................... 26-27

Curriculum Total ............................................. 128

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with composite ACT scores of less than 21 are required to register for English 110

2 Refer to department or curriculum guide for course options

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.

Natural Resources Management
www.ag.ndsu.nodak.edu/nrm

With increasing human pressure and a growing need to balance competing demands, our world needs new and better ways to manage society’s impacts on the environment. Natural Resources Management (NRM) is dedicated to preparing students for challenging careers requiring the holistic ecological perspective and global sociological perspective necessary for examining and solving complex natural resource management problems. A major in Natural Resources Management is offered in collaboration with a number of academic departments and colleges on campus. For further information, refer to the Interdisciplinary Programs section.

Range Science
www.ag.ndsu.edu/range

Range Science is a unique program that blends science and management for the purpose of sustaining rangelands. Rangelands are important for the diverse array of products and services they provide. Rangelands are important for ranching, wildlife, water, and recreation to name a few. Rangelands cover over 40% of the earth’s land and include grasslands, prairies, savannas, shrublands, deserts, meadows, marshes, wetlands, alpine, arctic, and some types of forests. Rangelands are comprised mainly of native grasses, forbs, and shrubs which are extremely productive and rich in biodiversity.

Just as rangelands are diverse, so too are the careers available in rangeland management. Professional career options for rangeland managers are in private and public land management, scientists, educators, ranching, wildlife and fisheries, hydrology and economics. The majority of graduates in Range Science find employment with state and federal agencies as range conservationists with the USDA Forest Service, Natural Resources Conservation Service, Bureau of Land Management, U.S. Fish and Wildlife Service. Bureau of Indian Affairs, National Park Service, State Land Department, State Health Department, universities and others. Career tracks in agribusiness and non-profit organizations are also possible. Students in the Range Science program will take courses in Animal Science, biology, botany, chemistry, economics, natural resources management, plant sciences, soil science, statistics, zoology, as well as the requirements for general education.

Sample ’08-09 Curriculum
Range Science Major

General Education Requirements  Credits
First Year Experience (F):
AGRI 189, Skills for Academic Success .............. 1

Communications (C):
COMM 110, Fund of Public Speaking .................. 3
ENGL 110*, 120, College Comp I, II .................. 3, 3
ENGL Upper Level Writing Course2 .................. 3

Quantitative Reasoning (R):
STAT 330, Intro Stats .................................. 3

Science & Technology (S):
CSCI 114, Microcomputer Applications or CSCI 116, Busn Use of Computers .............. 3 or 4

First Year Experience (F):
Cultural Diversity (D)3 ................................ --

Global Perspective (G) ................................ --

ECON 201, Prin of Microeconomics ................. 3

Total .......................................................... 40

Major Requirements Credits
AGRI 150, Agricultural Orientation .................... 1
ANSC 114, Intro to Animal Science ..................... 3
ANSC 123, Feeds & Feeding or ANSC 220, Livestock Production .................. 3
BIOL 151, 151L, Gen Biology I, Lab .................... 3, 1
BOT 314, Systemic Botany .............................. 3
BOT 380, Plant Physiology .............................. 3
CHEM 260, Elements of Biochemistry ................. 4
MATH 103, College Algebra ................................ 3
PLSC 219, Intro Prairie & Comm Forestry or PLSC 320, Prin of Forage Production .......... 3
PLSC 323, Prin of Weed Science ....................... 3, 2
RNG 225, Natural Resource & Agro-Ecology ........ 3
RNG 336, Intro to Range Science ....................... 3
RNG 450, Range Plants .................................. 3

Total .......................................................... 128

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with composite ACT scores of less than 21 are required to register for English 110

2 Refer to department or curriculum guide for course options

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.
### Crop and Weed Sciences Major

Instruction in crop and weed sciences includes field and forage crop production and management, weed science, general and plant genetics, plant breeding, experimental design, and biotechnology. The study of botany and other plant sciences, entomology, plant pathology, and soil science is basic or related to crop and weed sciences. Students may obtain either a major or minor. The Crop and Weed Sciences major or minor is intended for general use in sales, research, and technical services (crop consultant) of agribusinesses involved in seed, chemical, and other plant production and management aspects; in natural resources conservation service; by those interested in production agriculture; or as a prerequisite for graduate study.

### Sample '08-09 Curriculum

#### Crop Science Minor

**Major Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI 150, Agr Orientation</td>
<td>1</td>
</tr>
<tr>
<td>SOIL 210, Intro Soil Science</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 151, Gen Biology I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1101, 120, College Comp I</td>
<td>3, 3</td>
</tr>
</tbody>
</table>

**Total** | 16

#### Sample '08-09 Curriculum

#### Soil Science

- **Department of Plant Sciences**
  
  www.ag.ndsu.nodak.edu/plantsci

- **Crop and Weed Sciences Major**
- **Soil Science Minor**
  
  Instruction in crop and weed sciences includes field and forage crop production and management, weed science, general and plant genetics, plant breeding, experimental design, and biotechnology. The study of botany and other plant sciences, entomology, plant pathology, and soil science is basic or related to crop and weed sciences. Students may obtain either a major or minor. The Crop and Weed Sciences major or minor is intended for general use in sales, research, and technical services (crop consultant) of agribusinesses involved in seed, chemical, and other plant production and management aspects; in natural resources conservation service; by those interested in production agriculture; or as a prerequisite for graduate study.

- **Sample '08-09 Curriculum**
  
  #### Soils Science Minor

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI 150, Ag Orientation</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 151, Gen Biology I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1101, 120, College Comp I</td>
<td>3, 3</td>
</tr>
</tbody>
</table>
  
  **Total** | 16

Note: A minimum of eight credits must be taken at NDSU.
Students must complete BIOC 460, BOT 380, 380L, CHEM 341, 341L, and MATH 146 must be taken under the general basic and applied sciences requirements, plus 12 credits of science electives from outside the agriculture field. Suggested electives are: BIOC 460, 461, BOT 314, 460, CHEM 342, MATH 147, PHYS 211, 212, or STAT 331.

### Weed Science
This option is intended for students interested in crop consulting, weed science, or integrated pest management. AGEC 375 or BUSN 431, BOT 380, PLSC 453, and PPTH 454 are required. ASM 378, BOT 314, PLSC 210, 211, and SOIL 322 are suggested electives.

### Special Opportunities
Agronomy Club: The Agronomy Club meets twice each month. Members join in campus and community activities, arrange speakers on agricultural topics, and participate in meetings and contests at the regional and national levels. The club also coordinates tours to local agribusinesses to gain a better perspective of career opportunities. Students with an interest in agriculture are encouraged to attend, regardless of chosen major.

### Crop and Weed Sciences Minor
Students may minor in Crop and Weed Sciences by selecting a total of 18 credits of study in crop and weed sciences or closely related fields, including PLSC 110, 225, two courses from 315 and 315L, 320, or 323, plus a minimum of five credits approved by the department. A minimum of 8 credits must be taken at NDSU, and at least six credits must be at the 300-400 level.

### Sample '08-09 Curriculum Crop & Weed Sciences Minor

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLSC 110, World Food Crops</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 225, Principles of Crop Production</td>
<td>3</td>
</tr>
<tr>
<td>PLSC Electives1</td>
<td>12</td>
</tr>
</tbody>
</table>

### Curriculum Total: 18 Credits

#### Additional Requirements (varies with option)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Electives for degree completion</td>
<td>4-19</td>
</tr>
</tbody>
</table>

### Curriculum Total: (All Options) 128 Credits

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENG 120 is received). Students who complete English 120 with a C- or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2. Refer to department or curriculum guide for course options.


### Horticulture Major

Instruction and study in horticulture is focused on fruits, vegetables, turfgrass, and woody and herbaceous landscape plants, including propagation, production, culture, marketing, processing, and utilization. Horticulture encompasses the design and planting for landscapes, parks, highways, and public facilities, including interiorscapes, in rural, suburban, and urban areas. It includes skills for management of nursery, garden center, greenhouse, seed, fruit, vegetable, turfgrass, biotechnology, and specialty crop enterprises, as well as floral design and flower shops.

The Horticulture major is a four-year curriculum leading to the B.S. degree. Students also may minor in Horticulture. Prospective students should consult with horticulture faculty regarding programs and options so their educational needs may be best fulfilled. Master of Science and Ph.D. degree programs are also available. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

### Sample '08-09 Curriculum Horticulture Major

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>STAT 330, Intro Stats</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>CHEM 121, 121L, Gen Chemistry I, Lab</td>
<td>3.1</td>
</tr>
<tr>
<td>CHEM 122, Gen Chemistry II</td>
<td>3.3</td>
</tr>
<tr>
<td>CSCI 114, Microcomputer Plgs or</td>
<td></td>
</tr>
<tr>
<td>CSCI 116, Busn Use of Computers</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>3</td>
</tr>
<tr>
<td>Including: ECON 201, Principles of Microecon</td>
<td></td>
</tr>
<tr>
<td>ECON 202, Principles of Macroecon</td>
<td></td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td>ECON 201, Principles of Microecon</td>
<td></td>
</tr>
</tbody>
</table>

### Curriculum Total: 40 Credits
### Options (choose one)

#### Option 1: Horticulture Biotechnology

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLSC 484</td>
<td>Plant Tissue, Cult &amp; Microprop</td>
<td>2</td>
</tr>
<tr>
<td>PLSC 368</td>
<td>Plant Propagation</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 323</td>
<td>Prin of Weed Science</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 120</td>
<td>Fund of Physics</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 350</td>
<td>Foundations of Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 315L</td>
<td>Genetics Lab</td>
<td>1</td>
</tr>
<tr>
<td>BUSN 323</td>
<td>Prin of Weed Science</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 360</td>
<td>Horticulture Food Crops</td>
<td>4</td>
</tr>
<tr>
<td>PLSC 468</td>
<td>Plant Propagation</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 484</td>
<td>Plant Tissue, Cult &amp; Microprop</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 485</td>
<td>Arboriculture Science</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 375</td>
<td>Turfgrass Management</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 365</td>
<td>Herb Land Plants</td>
<td>2</td>
</tr>
<tr>
<td>PLSC 412</td>
<td>Nursery Prod &amp; Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 355</td>
<td>Woody Landscape Plants</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 491</td>
<td>Hort Seminar</td>
<td>1</td>
</tr>
<tr>
<td>PLSC 455</td>
<td>Cropping Systems</td>
<td>3</td>
</tr>
<tr>
<td>PPTH 324</td>
<td>Intro to Plant Pathology</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 210</td>
<td>Intro to Soil Science</td>
<td>3</td>
</tr>
<tr>
<td>PLSC Electives*</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td><strong>51</strong></td>
</tr>
</tbody>
</table>

#### Option 2: Horticulture Science

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 372</td>
<td>Sports &amp; Urban Turfgrass</td>
<td>4</td>
</tr>
<tr>
<td>PLSC 360</td>
<td>Plant Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 360</td>
<td>Foundations of Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 355</td>
<td>Turfgrass Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 365</td>
<td>Herb Land Plants</td>
<td>2</td>
</tr>
<tr>
<td>BUSN 375</td>
<td>Turfgrass Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 465</td>
<td>Adv Landscape Plants</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 485</td>
<td>Arboriculture Science</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 486</td>
<td>Eco-Physiology of Hort Crops</td>
<td>2</td>
</tr>
<tr>
<td>PPTH 456</td>
<td>Forest &amp; Shade Tree Pathology</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 210</td>
<td>Intro to Soil Science</td>
<td>3</td>
</tr>
<tr>
<td>BUSN Electives*</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td><strong>78</strong></td>
</tr>
</tbody>
</table>

#### Option 3: Landscape Design

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT 380</td>
<td>Plant Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BOT 460</td>
<td>Plant Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 431</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Applied Calc I</td>
<td>4</td>
</tr>
<tr>
<td>BUSN 380</td>
<td>Fund of Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 315L</td>
<td>Genetics Lab</td>
<td>1</td>
</tr>
<tr>
<td>PLSC 323</td>
<td>Prin of Weed Science</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 360</td>
<td>Horticulture Food Crops</td>
<td>4</td>
</tr>
<tr>
<td>PLSC 368</td>
<td>Plant Propagation</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 384</td>
<td>Plant Tissue, Cult &amp; Microprop</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 486</td>
<td>Eco-Physiology of Hort Crops</td>
<td>2</td>
</tr>
<tr>
<td>MATH 103</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 315L</td>
<td>Genetics Lab</td>
<td>1</td>
</tr>
<tr>
<td>BUSN 323</td>
<td>Prin of Weed Science</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 365</td>
<td>Herb Land Plants</td>
<td>2</td>
</tr>
<tr>
<td>BUSN 375</td>
<td>Turfgrass Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 465</td>
<td>Adv Landscape Plants</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 485</td>
<td>Arboriculture Science</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 486</td>
<td>Eco-Physiology of Hort Crops</td>
<td>2</td>
</tr>
<tr>
<td>PPTH 456</td>
<td>Forest &amp; Shade Tree Pathology</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 210</td>
<td>Intro to Soil Science</td>
<td>3</td>
</tr>
<tr>
<td>BUSN Electives*</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td><strong>48</strong></td>
</tr>
</tbody>
</table>

### Additional Requirements (varies with option)

- **2** Refer to department or curriculum guide for course options.
- **3** May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.

#### Sample '08-09 Curriculum

### Horticulture Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLSC 210, 211</td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>PLSC Electives*</td>
<td><strong>14</strong></td>
</tr>
</tbody>
</table>

### Curriculum Total: **18**

1. Refer to department or curriculum guide for course options.

### Sample '08-09 Curriculum

#### Two-Year Pre-Forestry

### First Year

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI 150, Ag Orientation</td>
</tr>
<tr>
<td>AGRI 189 Skills for Academic Success</td>
</tr>
<tr>
<td>BIOL 150, 150L General Biology I/Lab or BIOL 151, 151L General Biology II/Lab</td>
</tr>
<tr>
<td>BOT 372, Struc &amp; Div of Plants &amp; Fungi</td>
</tr>
<tr>
<td>CHEM 121, 121L, Gen Chem I, Lab</td>
</tr>
<tr>
<td>CHEM 122, Gen Chem II</td>
</tr>
<tr>
<td>BIOL 322, Diversity &amp; Mgmt</td>
</tr>
<tr>
<td>ENGL 110, 120, College Composition I, II</td>
</tr>
<tr>
<td>MATH 103, 105, or above, College Alg, Trig</td>
</tr>
<tr>
<td>Wellness</td>
</tr>
</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>CSCI 114, Microcomputer Packages or CSCI 115, Use of Computers</td>
</tr>
<tr>
<td>ENGL 110, College Composition III</td>
</tr>
<tr>
<td>ENGL 110, 120, College Composition II, III</td>
</tr>
<tr>
<td>PHYS 101, General Chemistry</td>
</tr>
<tr>
<td>CHEM 121, 121L, Gen Chem I, Lab</td>
</tr>
<tr>
<td>CHEM 122, Gen Chem II</td>
</tr>
<tr>
<td>BIOL 150, 150L General Biology I/Lab or BIOL 151, 151L General Biology II/Lab</td>
</tr>
<tr>
<td>BOT 372, Struc &amp; Div of Plants &amp; Fungi</td>
</tr>
<tr>
<td>BUSN 350, Foundations of Mgmt</td>
</tr>
<tr>
<td>BUSN 355, Turfgrass Management</td>
</tr>
<tr>
<td>BUSN 365, Herb Land Plants</td>
</tr>
<tr>
<td>BUSN 375, Turfgrass Management</td>
</tr>
<tr>
<td>BUSN 465, Adv Landscape Plants</td>
</tr>
<tr>
<td>BUSN 485, Arboriculture Science</td>
</tr>
<tr>
<td>BUSN 486, Eco-Physiology of Hort Crops</td>
</tr>
<tr>
<td>POLS 360, Government Administration</td>
</tr>
<tr>
<td>PPTH 456, Forest &amp; Shade Tree Pathology</td>
</tr>
<tr>
<td>SOIL 210, Intro to Soil Science</td>
</tr>
<tr>
<td>BUSN Electives*</td>
</tr>
</tbody>
</table>
| Total: **44** |**
### Major Requirements | Credits
---|---
PLSC 210, 211, Horticulture Sci, Lab | 3,1
PLSC 315, 315L, Genetics, Lab | 3,1
PLSC 323, Prin of Weed Science | 3
PLSC 341, Land Bid & Contracting | 1
PLSC 375, Turfgrass Management | 3
PLSC 381, Sports Turf Operations | 3
PLSC 457, Turfgrass Sci, Ecol/Mgmt (cap) | 3
PLSC 468, Golf Course Irrigation I | 2
PLSC 469, Golf Course Irrigation II | 1
PLSC 491, Seminar | 1
PLSC 496, Field Experience | 2
**Total** | **27**

### Additional Requirements | Credits
---|---
SOIL 210, Intro to Soil Science | 3
Math 103, College Algebra | 3
**Total** | **35-37**

### Curriculum Total | Credits
---|---
128

### Related Requirements | Credits
---|---
AGRI 150, Ag Orientation | 1
ACCT 102, Fund of Accounting | 3
AGEC 242, Intro to Ag Mgmt or AGEC 244, Ag Mgmt | 4 or 3
BOT 380, Plant Physiology | 3
ENT 350, General Entomology | 5
MATH 103, College Algebra | 3
PPTH 324, Intro Plant Pathology | 3
SOIL 210, Intro to Soil Science | 3
SOIL 322, Soil Fert & Fertilizers | 3
PLSC Electives | 5
**Total** | **32-33**

### Additional Requirements | Credits
---|---
Free Electives (for degree completion) | 27-28
**Total** | **27-28**

### Curriculum Total | Credits
---|---
128

---

### Microbiology Major

This department offers instruction in microbiology, including courses in general microbiology, pathogenic microbiology, parasitology, virology, immunology, food microbiology, microbial physiology and bacterial genetics. The department also offers courses in epidemiology, animal disease, and food safety to enhance our students' understanding of applied microbiology and infectious disease.

### Microbiology Major

Microbiology is a fundamental biological science which offers a variety of challenges and opportunities. Microbiologists have made some of the most important scientific discoveries in this century. Since 1910, approximately one-third of the Nobel Prizes in medicine and physiology have been awarded to microbiologists. The discipline covers a wide spectrum of specialized interest areas that illustrate how microbes affect human and animal health, our environment, food safety, food technology, and the biotechnology industry. In recent years, the field of microbiology has had a major impact upon virtually all other scientific disciplines. For this reason, even students who choose to major in other fields may benefit from a minor in microbiology.

Students majoring in microbiology are well prepared to enter graduate school, veterinary school, and medical school, or to establish careers in food or pharmaceutical industries, hospitals, public health agencies, universities, research laboratories, and other biomedical industries. A 2.50 institutional grade point average and a minimum grade of C in core and elective microbiology courses are required to remain in the Microbiology major.

### Sample '08-09 Curriculum

#### Microbiology Minor

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>AGRI 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110*, 120, College Comp I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>MIRC 354, Scientific Writing</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>STAT 330, Intro Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>BIOL 150, 150L, Gen Biology I, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>CHEM 121, 121L, Gen Chemistry I, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>Phys 211, 211L, College Physics I, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

#### Major Requirements | Credits
---|---
MIRC 350, 350L, Gen. Microbiology I, Lab | 3,1
MIRC 460, 460L, Pathogenic Micro, Lab | 3,2
MIRC 470, Basic Immunology | 3
MIRC 471, Immunology & Serology Lab | 2
MIRC 475, Animal Virology | 3
MIRC 480, Bacterial Physiology | 3
MIRC 482, Bacterial Genetics & Phage | 3
MIRC 486, Capstone Experience | 3
MIRC Electives | 7
**Total** | **33**

#### Related Requirements | Credits
---|---
AGRI 150, Ag Orientation | 1
BIOC 460, Fund of Biochem & Molec Biol I | 4
BIOC 461, Fund of Biochem & Molec Biol II | 4
BIOC/BOT/ZOO Elective | 3
CHEM 122, 122L, Gen Chemistry II, Lab | 3,1
CHEM 341, 341L, Organic Chem I, Lab | 3,1
CHEM 342, Organic Chem II | 3
MATH 103, College Algebra & MATH 105, Trigonometry or MATH 146, Applied Calc I | 3,3 or 4
Phys 212, 212L, College Physics II, Lab | 3,1
PLSC 315, 315L, Genetics | 3,1
**Total** | **35-37**

#### Additional Requirements | Credits
---|---
Free Electives (for degree completion) | 16-18
**Total** | **16-18**

---

### Sample '08-09 Curriculum

#### Microbiology Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
</table>
| MIRC 350, 350L, Gen. Microbiology I, Lab | 3,1
| MIRC Elective* | 3 |
| MIRC 300–400 Level Electives* | 9-10 |

#### Curriculum Total | Credits
---|---
16-17

---

### Pre-Veterinary Medicine

NDSU offers excellent programs that prepare students for application to a college of veterinary medicine. All veterinary schools stress the importance of high scholastic standing and judge applicants on academic preparation, knowledge of the veterinary profession, experience and character.

Because the number of students admitted to veterinary schools is limited, prospective students should check the specific requirements of the college of their choice well in advance to make certain that preparatory work is appropriate.

Pre-veterinary medicine is not a specific major, and students are encouraged to pursue a major in their area of interest while at NDSU. In addition, students preparing for application to a veterinary school should consult with a pre-veterinary medicine advisor. The department is a member of the Association of American Veterinary Medical Colleges (AAVMC), which administers the Veterinary Medical College Application Service (VMCAS). Communication with pre-veterinary students is facilitated when students are enrolled in the College of Agriculture, Food Systems, and Natural Resources. Visit the VMS, Pre-Veterinary Medicine Web site for further information.

http://vetmicro.ndsu.edu/prevet.htm
The College of Arts, Humanities and Social Sciences embraces the teaching, research, creative activities and service objectives of NDSU’s land grant mission, and the needs of a diverse constituency. The college is committed to:

- Providing its students with the highest quality of preparation in an atmosphere that promotes intellectual rigor, critical inquiry, citizenship, and creative decision-making requisite for personal growth and professional success.
- Encouraging in its faculty exemplary scholarship of teaching, research, and service, leading to significant publications, creative work and performances.
- Invigorating the tradition of outreach through enriching performance, presentation, and cultural understanding.

In its vision to realize human potential and achievements, the College of Arts, Humanities and Social Sciences is guided by the qualities of creativity, ethical integrity, and mutual respect.

B.A. or B.S. Degree

Students seeking a broad educational background may choose to complete requirements for either a Bachelor of Arts or Bachelor of Science degree. Majors available for either degree include the following:

- Agricultural Communication
- Anthropology
- Art
- Classical Languages
- Criminal Justice
- Emergency Management
- English
- French
- Health Communication
- History
- Humanities
- Journalism, Broadcasting
- and Mass Communication Technology
- Management Communication
- Music
- Philosophy-Humanities
- Political Science
- Public History
- Public Relations and Advertising
- Social Science
- Sociology
- Spanish
- Theatre Arts

B.S. Degree with Special Professional Intent

Students planning a specific career with a baccalaureate background are encouraged to pursue the related curriculum leading to the Bachelor of Science degree. The following major is available for the B.S. with special professional intent:

**Political Science – Public Service Option**

B.F.A. and B.Mus. Degrees

Bachelor’s of Fine Arts in theatre arts and in visual arts and a Bachelor of Music are available and are outlined under the Division of Fine Arts.

Graduate Degrees

Master’s degrees are offered in emergency management, English, history, mass communication, music, political science, social science, sociology, and speech communication. Doctoral degrees are offered in communication, criminal justice, emergency management, history, and music. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Teacher Certification

Many of the majors available through the College of Arts, Humanities and Social Sciences lead to careers in teaching. Students who are interested in becoming professional educators should refer to the degree program offered through the School of Education. Teacher certification is available in the following areas: English, French, history, instrumental music*, social science, sociology, Spanish, and vocal music*.

To meet requirements of the No Child Left Behind Act of 2001, students interested in teacher education are encouraged to declare a double major in their discipline and in education (i.e. History and History Education). Such double majors may typically be earned by successful completion of a few additional credits. Students should contact their advisors or the Office of Registration and Records for details. Students are encouraged to declare their primary and secondary majors with the Office of Registration and Records, 110 Ceres Hall.

* K-12 certification available; all others are secondary only.

**Degree Requirements**

All degree candidates must apply for graduation through the Office of Registration and Records according to university procedures and deadlines.

A minimum of 122 credits of which at least 37 must be at the 300-400 level is required for the B.A. or B.S. degree.

Bachelor of Arts degree requirements include proficiency of one foreign language at the second-year college level. Bachelor of Science degree requirements include completion of an approved minor.

Students with two or more years of a foreign language in high school may earn advanced placement credit according to the guidelines listed in the Modern Languages section.

Students in the college may take courses under the pass/fail option for free elective credits only, with a limit of 16 hours.

All majors must complete the 40 credit university-wide general education requirements.

An additional 12 credits are required by the College of Arts, Humanities and Social Sciences as follows:

**Requirements**

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Arts (art, music, theatre arts)</td>
<td>3</td>
</tr>
<tr>
<td>Humanities (classical languages, English, French, German, humanities, history, philosophy, religion, Spanish)</td>
<td>3</td>
</tr>
<tr>
<td>Social Science (anthropology, communication, criminal justice, emergency management, political science, sociology)</td>
<td>3</td>
</tr>
<tr>
<td>Area outside the student’s major</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

All courses except internships may be used to fulfill these requirements.

**Field Experience Courses**

1. Field Experience/Internships (496) do not meet the requirements for general education.
2. Departments may adopt either pass/fail or letter grade options for Field Experience/Internships.
   a) Where Field Experience/Internship credits are a requirement of a program, these credits may be graded pass/fail to satisfy requirements for a major.
   b) Where Field Experience/Internship credits are not a requirement of a program, up to three credits may be graded pass/fail to satisfy requirements for a major.

**Cooperative Education**

Cooperative Education, a program of the Career Center, offers undergraduate and graduate students an opportunity to integrate classroom study with paid, career-related work experience for academic credit. Work may be full-or part time. Credit is awarded directly by the Cooperative Education program. A Cooperative Education experience may substantially improve students’ employment opportunities after graduation.
Right of Petition
Students seeking deviation from any academic rules and regulations administered by the college may appeal in writing to the Committee on Student Progress.

Pre-Professional Curricula
Requirements for admission to most professional academic programs may be met at NDSU. The specific courses taken in a pre-professional program depend primarily upon the admission requirements of the program to which a student wishes to apply.

Pre-Law
Although a baccalaureate degree is a requirement for admission to law school, most law schools do not prescribe a specific undergraduate program. Emphasis is placed on the development of scholarly skills and insights rather than the mastery of a prescribed subject. Thus, the pre-law student may elect the Bachelor of Arts or Bachelor of Science degree, selecting a major or minor of special personal interest. For advisement purposes, new applicants to NDSU who indicate Pre-Law enter as Political Science Majors. (See Department of Criminal Justice and Political Science). To attain the necessary breadth of knowledge for successful practice, the student should elect the basic courses in several fields of learning. At the same time the student should avoid an elective program of only single courses in many fields, opting instead for some depth of study in each elected field.

Interdisciplinary Programs
The College of Arts, Humanities and Social Sciences participates in three interdisciplinary programs on campus. For further information on any of these programs, refer to the Interdisciplinary Programs section of this Bulletin.

Fraud Investigation Minor
Students in this interdisciplinary minor will study the causes of fraud, as well as the detection, investigation, and prevention of fraud.

Gerontology Minor
This program provides students with an integrated understanding of the process of aging, aging services, and the aged in America.

Women’s Studies Major and Minor
The goal of Women’s Studies is to examine the contributions of women to all aspects of society, to explore the intersections of race, class, sexual orientation, age, and physical ability with gender both globally and nationally, to investigate the heritage, challenges and concerns of women, and to provide a newer and broader understanding of women in all fields.

Department of Communication
www.ndsu.edu/communication
The Department of Communication provides majors and minors in Agriculture Communication; Health Communication; Journalism, Broadcasting & Mass Communication Technologies; Management Communication; and Public Relations & Advertising at the undergraduate level.

Pre-Communication Preparation. Students interested in pursuing an undergraduate degree offered by the Department of Communication are enrolled as pre-professional students and must first complete all courses and requirements associated with the Pre-Communication preparation designation. Once all Pre-Communication preparation courses and requirements are met, the student completes and submits the Pre-Communication form, available on the department website, to the department’s academic assistant. After verification of accuracy, the student is accepted into the professional program and can continue pursuing a degree in the Department of Communication.

Students in all five majors will be required to pass with a B or higher the following courses: ENGL 120, COMM 110 OR 111, COMM 112, COMM 114, COMM 212, COMM 216, and SOC 110 OR POLS 110 OR PSYC 111 OR CJ 201 for a total of 21 credits. Pre-Communication Preparation courses may be retaken only once for program applicability. Students who have not completed the entire Pre-Communication preparation designation may not register for 300- and 400-level Communication classes.

Communication with Honors Program
Students with a 3.25 average or higher may enroll in COMM 111, 217, and 321 and a senior seminar within the major and receive Communication with Honors designation by the department.

Agricultural Communication Major
B.A. or B.S. in Agricultural Communication (36 credit hours)
A major or minor in Agricultural Communication combines the resources and expertise of two units, communication and agriculture, to produce trained communicators who can explain science, technologies, and complex agricultural issues to diverse audiences. Applicants for the major must have been accepted by NDSU as degree seeking.

The curricular structure of the Agricultural Communication program is listed below for students entering the program. Students will complete an applied capstone course after completing all other required coursework.

Sample '08-09 Curriculum
Agricultural Communication Major

General Education Requirements Credits
First Year Experience (F):
- UNIV 189, Skills for Academic Success 6
- Communications (C):
  - COMM 110, Fund of Public Speaking 3
  - ENGL 110, 120, College Composition I, II 6
  - ENGL Upper Level Writing Course 3
- Quantitative Reasoning (Q) 3
- Science & Technology (S) 10
- Humanities & Fine Arts (A) 6
- Social & Behavioral Sciences (B): COMM 112, Undst Media/Social Change 3
- COMM 114, Human Communication 3
- Wellness (W) 2
- Cultural Diversity (D) 3
- COMM 216, Intercultural Communication 3
- Global Perspective (G) 3
  Total: 40

College/Department Requirements Credits
- Humanities Elective 3
- Social Science Elective 3
- Fine Arts Elective 3
- AHSS Elective (outside of major area) 3
  Total: 12

Major Requirements Credits
- COMM 212, Interpersonal Communication 3
- COMM 216, Intercultural Communication 3
- SOC 110, Intro to Soc or POLS 110, Intro to Political Sci or PSYC 111, Intro to Psychology, or CJ 201, Intro to Criminal Justice 3
- COMM 320, Communication Analysis 3
- COMM 301, Rhetorical Traditions or COMM 321, Intro to Communication Theory 3
- COMM 489, Capstone in Communication 3
- Professional Specialization Electives 21
- Agriculture Electives (upper level) 6
  Total: 75

Additional Requirements Credits
- Free Electives (for degree completion) 25
  Total: 25

Curriculum Total (min) 122

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.
2. Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum
Health Communication Major
B.A. or B.S. in Health Communication (36 credit hours)
A major or minor in Health Communication is an “applied” degree aimed at providing both practitioners and future civic leaders with the knowledge they need to improve health services and public health. Applicants for the major must have been accepted by NDSU as degree seeking.

The curricular structure of the Health Communication program is listed below for students entering the program. Students will complete an applied capstone course after completing all other required coursework.

Sample '08-09 Curriculum
Health Communication Major

General Education Requirements Credits
First Year Experience (F):
- UNIV 189, Skills for Academic Success 6
- Communications (C):
  - COMM 110, Fund of Public Speaking 3
  - ENGL 110, 120, College Comp I, II 6
  - ENGL Upper Division Writing 3
- Quantitative Reasoning (Q) 3
- Science & Technology (S) 10
- Humanities & Fine Arts (A) 6
- Social & Behavioral Sciences (B): COMM 112, Undst Media/Social Change 3
  - COMM 114, Human Communication 3
- Wellness (W) 2
- Cultural Diversity (D) 3
- COMM 216, Intercultural Communication 3
- Global Perspective (G) 3
  Total: 40

College/Department Requirements Credits
- Humanities Elective 3
- Social Science Elective 3
- Fine Arts Elective 3
- AHSS Elective (outside of major area) 3
  Total: 12

Major Requirements Credits
- COMM 212, Interpersonal Communication 3
- COMM 216, Intercultural Communication 3
- SOC 110, Intro to Soc or POLS 110, Intro to Political Sci or PSYC 111, Intro to Psychology, or CJ 201, Intro to Criminal Justice 3
- COMM 320, Communication Analysis 3
- COMM 301, Rhetorical Traditions or COMM 321, Intro to Communication Theory 3
- COMM 489, Capstone in Communication 3
- Professional Specialization Electives 21
- Health Electives (upper level) 6
  Total: 75

Additional Requirements Credits
- Free Electives (for degree completion) 25
  Total: 25

Curriculum Total (min) 122

1. Refer to dept or curriculum guide for course options.
Major Requirements

COMM 212, Interpersonal Communication ........................................... 3
COMM 216, Interpersonal Communication ........................................... 3
SOC 110, Intro to Soc or POLS 110, Intro to Political Sci or PSYC 111, Intro to Psychology, or CJ 201, Intro to Criminal Justice .................... 3
COMM 320, Communication Analysis .................................................. 3
COMM 301, Rhetorical Traditions or COMM 321, Intro to Comm Theory ........................................... 3
COMM 489, Capstone in Communication .............................................. 3
PSYC 214, Social Interaction .............................................................. 3
COMM 380, Health Communication I .................................................... 3
Professional Specialization Electives 1 .................................................. 15
Applied Health Electives (300-400 level) .............................................. 9
Total ........................................................................................................ 48

Additional Requirements

Free Electives (for degree completion) ...................................................... 25

Total ........................................................................................................ 25

Curriculum Total (min.) ........................................................................... 122

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.


Sample ’08-09 Curriculum

Health Communication Minor

Requirements

COMM 112, Undst Media/Social Change .................................................. 3
COMM 114, Human Communication .................................................... 3
COMM 212, Interpersonal Communication ........................................... 3
COMM 216, Intercultural Communication ............................................. 3
COMM 380, Health Communication I .................................................... 3
Professional Specialization Electives 1 .................................................... 6

Total ........................................................................................................ 21

1 Refer to department or curriculum guide for course options.

Journalism, Broadcasting, and Mass Communication Technologies Major

B.A. or B.S. in Journalism, Broadcasting, and Mass Communication Technologies (36 credits)

A major or minor in Journalism, Broadcasting, and Mass Communication Technologies (BMCT) is designed to help students learn strategies for using mass communication media. Applicants for the major must have been accepted by NDSU as degree seeking.

The curriculum structure of the Journalism, Broadcasting, and Mass Communication Technologies program is listed below for students entering the program. The major consists of three tracks: Journalism, Broadcasting, and Web-based Communication. Each track has separate requirements and students must choose one track. Students will complete an applied capstone course after completing all other required coursework.

Sample ’08-09 Curriculum

Journalism, Broadcasting, and Mass Communication Technologies Major

General Education Requirements

First Year Experience (F):

UNIV 189, Skills for Academic Success ..................................................1
Communications (C):

COMM 110, Fund of Public Speaking .................................................. 3
ENGL 110 I, 120, College Comp I, II .................................................... 3,3
ENGL Upper Division Writing Course 2 .................................................. 3

Quantitative Reasoning (R) ................................................................... 3
Science & Technology (S) .................................................................... 10
Humanities & Fine Arts (A) ................................................................. 6
Social & Behavioral Sciences (B):

COMM 112, Undst Media/Social Change .................................................. 3
COMM 114, Human Communication .................................................... 3
Wellness (W) ........................................................................................ 2
Cultural Diversity (D) ........................................................................... 3
COMM 216, Intercultural Communication ............................................. 3
Global Perspective (G) 2 .....................................................................

Total ........................................................................................................ 40

College/Department Requirements

Humanities Elective .................................................................................. 3
Social Science Elective ............................................................................ 3
Fine Arts Elective .................................................................................... 3
AHSS Elective (outside of major area) ....................................................... 3

Total ........................................................................................................ 12

1 Refer to department for course options.

Sample ’08-09 Curriculum

Internet Web Design Minor

Requirements

COMM 260, Prin of Internet Web Design .................................................. 3
COMM 261, Intro to Web Development .................................................... 3
COMM 496, Internship/Capstone Experience ......................................... 3
Professional Specialization Electives 3 .................................................... 9

Total ........................................................................................................ 21

1 Refer to department or curriculum guide for course options.

Management Communication Major

B.A. or B.S. in Management Communication (36 credit)

A major or minor in Management Communication is designed to train students to be effective managers and leaders in corporate environments. Applicants for the major must have been accepted by NDSU as degree seeking.

The curriculum structure of the Management Communication program is listed below for students entering the program. Students will complete an applied capstone course after completing all other required coursework.

Sample ’08-09 Curriculum

Management Communication Major

General Education Requirements

First Year Experience (F):

UNIV 189, Skills for Academic Success ..................................................1
Communications (C):

COMM 110, Fund of Public Speaking .................................................. 3
ENGL 110 I, 120, College Comp I, II .................................................... 3,3
ENGL Upper Level Writing 2 ................................................................. 3
Quantitative Reasoning (R) ................................................................... 3
Science & Technology (S) .................................................................... 10
Humanities & Fine Arts (A) ................................................................. 6
Social & Behavioral Sciences (B):

COMM 112, Undst Media/Soc Change .................................................... 3
COMM 114, Human Communication .................................................... 3
Wellness (W) ........................................................................................ 2
Cultural Diversity (D) ........................................................................... 3
COMM 216, Intercultural Communication ............................................. 3
Global Perspective (G) 2 .....................................................................

Total ........................................................................................................ 40

College/Department Requirements

Humanities Elective .................................................................................. 3
Social Science Elective ............................................................................ 3
Fine Arts Elective .................................................................................... 3
AHSS Elective (outside of major area) ....................................................... 3

Total ........................................................................................................ 12

1 Refer to department or curriculum guide for course options.

Major Requirements

COMM 212, Interpersonal Communication ........................................... 3
COMM 216, Intercultural Communication ............................................. 3
SOC 110, Intro to Sociology or POLS 110, Intro to Political Science or PSYC 111, Intro to Psychology or CJ 201, Intro to Criminal Justice .................................................. 3

Total ........................................................................................................ 21

1 Refer to department or curriculum guide for course options.


3 Refer to department or curriculum guide for course options.
### Sample '08-09 Curriculum

**Public Relations and Advertising Major (with Tracks in Public Relations and Advertising)**

**B.A. or B.S. in Public Relations and Advertising (36 credits)**

A major/minor in public relations and advertising is designed to prepare students to enter these professional fields. Applicants for the major must have been accepted by NDSU as degree seeking.

The curricular structure of the Public Relations and Advertising program is listed below for students entering the program. Students will select one of two tracks: a Public Relations track will orient students to the principles and practices of public relations as both a practice and a field of study. The second track, Advertising, will introduce students to the principles and practices of advertising. Students will complete an applied capstone course after completing all other required coursework.

#### Sample '08-09 Curriculum

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 301, Rhetorical Traditions</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM 321, Intro to Comm Theory</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM 320, Communication Analysis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM 489, Communication Capstone</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM 383, Org Communication I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM 482, Org Communication II</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM Specialization Electives</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>COMM 300-400 Electives</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

#### Additional Requirements

| Free Electives (min)                                                        | 25      |       |
| **Total**                                                                   | 25      |       |

#### Curriculum Total (min) 122

1. Refer to department or curriculum guide for course options.

#### Public Relations and Advertising Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I</td>
<td>3, 3</td>
<td></td>
</tr>
<tr>
<td>ENGL Upper Level Writing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 112, Underst Media/Soc Change</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMM 114, Human Communication</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

#### College/Department Requirements Credits

| Humanities Elective                                                        | 3       |       |
| Social Science Elective                                                    | 3       |       |
| Fine Arts Elective                                                         | 3       |       |
| AHSS Elective (outside of major area)                                      | 3       |       |
| **Total**                                                                   | 12      |       |

#### Major Requirements Credits

| COMM 212, Interpersonal Communication                                     | 3       |       |
| COMM 216, Intercultural Communication                                     | 3       |       |
| COMM 318, Argumentation & Advocacy                                         | 3       |       |
| COMM 343, Communication Ethics                                             | 3       |       |
| COMM 346, Communication Capstone                                          | 3       |       |
| COMM 348, Communication Management                                         | 3       |       |
| COMM 216, Intercultural Communication                                     | 3       |       |
| **Total**                                                                   | 12      |       |

#### Curriculum Total

1. Refer to department or curriculum guide for course options.

### Experiential On-Campus Opportunities

The department oversees several on-campus communication-related opportunities for students: KDSU 91.9 FM is an affiliate of North Dakota Public Radio with internships available for qualified students; Thunder Radio is NDSU's student-run radio station; and the Spectrum is a student-run newspaper published twice weekly throughout the academic year where students may receive credit for salary. In addition, departmental academic organizations include Public Relations Student Society of America, Lambda Pi Eta, and Pi Kappa Delta. For more information, contact the Department of Communication.

### Department of Criminal Justice and Political Science

**www.ndsu.edu/ndsu/cjps**

The department offers degree programs (B.A. and B.S.) as well as minor programs of study in Criminal Justice and Political Science.

#### Criminal Justice Major

The criminal justice practitioner deals with the broad areas of law enforcement, courts, corrections, and social services. Professional positions may include federal law enforcement, municipal law enforcement, juvenile and adult probation, counseling and correctional work in institutions, victim advocacy programs, and halfway houses. Within these broad areas the practitioner enjoys exciting professional challenges and opportunities for serving society and helping people.

Examples of agencies that have employed NDSU graduates include: the FBI, Drug Enforcement Administration, local police departments, sheriff's departments, Border Patrol, juvenile courts, Bureau of Criminal Investigation, U.S. Secret Service, probation and parole departments, juvenile and adult correctional instructions, halfway houses, and crime and delinquency prevention programs.

The Criminal Justice curriculum is an interdisciplinary program drawing on the social sciences, behavioral sciences, humanities, computer sciences, and accounting. A total of $58-59 credits (depending on coursework) is required for a major in criminal justice. A basic background in the social sciences, behavioral sciences, and civics is helpful.

#### Sample '08-09 Curriculum

**Criminal Justice Major**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I</td>
<td>3, 3</td>
<td></td>
</tr>
<tr>
<td>ENGL Upper Level Writing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

#### College/Department Requirements Credits

| Humanities Elective                                                        | 3       |       |
| Social Science Elective                                                    | 3       |       |
| Fine Arts Elective                                                         | 3       |       |
| AHSS Elective (outside of major area)                                      | 3       |       |
| **Total**                                                                   | 12      |       |

### Sample '08-09 Curriculum

**Criminal Justice Major**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I</td>
<td>3, 3</td>
<td></td>
</tr>
<tr>
<td>ENGL Upper Level Writing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

#### College/Department Requirements Credits

| Humanities Elective                                                        | 3       |       |
| Social Science Elective                                                    | 3       |       |
| Fine Arts Elective                                                         | 3       |       |
| AHSS Elective (outside of major area)                                      | 3       |       |
| **Total**                                                                   | 12      |       |
Criminal Justice Minor
The minor in Criminal Justice provides an opportunity for students with majors in fields outside of the Criminal Justice program to gain valuable knowledge regarding criminological theory and the history, operation and effectiveness of various parts of the criminal and juvenile justice system.

Sample '08-'09 Curriculum

Criminal Justice Minor

Requirements
CJ 201, Intro to Criminal Justice ........................................ 3
CJ 230, Criminology & Criminal Law .................................. 3
CJ 460, Criminalization .................................................... 3
CJ 461, Corrections ............................................................ 3
CJ/POLS Electives1 ......................................................... 5-6

Total ........................................................................................................ 17-18

1 Refer to department or curriculum guide for course options.

Criminal Justice Club and Internships
Students may expand their knowledge of criminal justice and career opportunities through the meetings with professionals and field trips sponsored by this club. The department also offers internships and cooperative education opportunities. For specific contact the Department of Criminal Justice and Political Science.

Political Science Major

Political science is the study of politics, government, and public policy. This includes the investigation of political institutions, international relations, law, and political values. The purpose of classes in political science is to provide students with knowledge to assist them in understanding how government and politics affect their everyday lives. A political science major offers the student career opportunities in public service, business, and education. Also, many students interested in attending law school select political science as a major. As part of its offerings the department offers a special program of pre-law advisement.

A total of 40 credits are required for a major in Political Science. All students are required to complete Introduction to Political Science (110) or American Government (115), Applied Research Methods (325), Political Ideologies (240), International Politics (220) or Comparative Politics (225), and Senior Seminar (489). In addition, four 400-level classes must be taken; one from each of these areas: law, American Government, comparative politics, and international relations. Nine credits of electives are also to be selected in consultation with an advisor.

Sample '08-'09 Curriculum

Political Science Major

General Education Requirements
First Year Experience (F) ................................................ 1
UNIV 189, Skills for Academic Success .......................... 1
Communications (C):
COMM 110, Fund of Public Speaking ............................ 3
ENGL 110, 120, College Comp L II ............................... 3
ENGL Upper Level Writing Course2 ................................ 3
Quantitative Reasoning (R) .............................................. 3
Science & Technology (S) ................................................ 10
Humanities & Fine Arts (A) ............................................. 6
Social & Behavioral Sciences (B) ...................................... 6
Including: POLS 110, Intro to Political Science or
POLS 115, American Govt
Wellness (W) ............................................................... 2
Cultural Diversity (D) .................................................... 2
Global Perspective (G) .................................................. 2

Total ................................................................................................. 40

CJ/POLS Electives1 ......................................................... 5-6

College/Department Requirements

Humanities Elective ............................................................ 3
Social Science Elective ....................................................... 3
Fine Arts Elective ............................................................. 3
AHSS Elective (outside of major area) ............................... 3

Total ................................................................................................... 12

Major Requirements

POL 220, International Politics or
POL 225, Comparative Politics ........................................ 3
POL 240, Political Ideologies ............................................. 3
POL 325, Applied Research Methods .............................. 4
POL 489, Seminar ............................................................ 3

Total ................................................................................................... 13

Additional Requirements

(General Political Science) Photos
POL 240, Political Ideologies ................................. 3
POLS Electives2 ........................................................... 12
Total ............................................................................................. 12

1 Refer to department or curriculum guide for course options.

Pre-Law Emphasis

The department offers a special Pre-Law emphasis for those individuals who wish to pursue careers in law. It consists of a major in Political Science (40 hours) that includes a concentration of law related courses, as well as required classes in English and communication. Electives in business, communication, criminal justice and accounting are also part of the emphasis. For further information and specific course requirements contact any political science faculty.
### Public Service Option

The Public Service option allows students to concentrate their coursework in two distinct areas of study: government administration and political management. The government administration area is designed for students seeking careers in the administration of public, private/public, or non-profit organizations. The political management area is designed for students seeking careers in connection to political parties, campaign consultants, interest groups, and the political media. Each area requires a 15 credit internship. For further information on the specific requirements, contact the department.

### Department of English

http://english.ndsu.edu

The English Department intends that its students will form a strong foundation in the liberal arts major and the practical, pre-professional student. Success in the marketplace is tied to the ability to analyze, understand, and restate written material. Thus, in its offerings, the department serves the traditions of language and literature, while it responds to the needs of today's students.

The department further reflects such responses in its participation in the Humanities major, the Scholars Program, and the Women's Studies minor. Moreover, the department supports the Cooperative Education Program and welcomes efforts to create student internships.

The English Department offers a Bachelor of Arts degree in English and a Bachelor of Science degree in English. A Bachelor of Arts degree in English Education and a Bachelor of Science degree in English Education also are offered between the Department of English and the School of Education.

The B.A. and B.S. degrees in English require 42 credits in English courses beyond the first-year English composition sequence. The B.A. degree requires two years of a foreign language or the equivalent competency; whereas, the B.S. requires a minor outside English.

The B.A. and B.S. degrees in English Education require 36 credits in English courses beyond the first-year English composition sequence and 34 credits in Education courses. The B.A. requires an additional six credits in Arts, Humanities and Social Science (AHSS) courses and two years of a foreign language or the equivalent competency. A B.S. degree in English Education with an option in communication is available that leads to certification in both English and Speech. English teaching majors should contact the School of Education or the English Education advisor for additional requirements.

Transfer credits with grades of D are not accepted for English major requirements.

### Sample '08-09 Curriculum

#### English Education Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>ENGL 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 358, Writing in Hum/Soc Sci</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 209, Intro to Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 321, Intro to Poetry</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 120, World Lit Masterpieces</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 251 or 252, British Lit I or II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 261 or 262, American Lit I or II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 271, Literary Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 360, Grammatical Structure</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 380, Shakespeare</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 458, Adv Writing Workshop</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 500-400 Literature Electives</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 321, Intro to Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 322, Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 381, Early Experience</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 411, Instruc, Planning, Meth &amp; Assess</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 481, Class Prac/Meth of Teach I-Engl</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 482, Class Prac/Meth of Teach II-Engl</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 485, Student Teach Seminar</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
</tr>
</tbody>
</table>

### Additional Requirements

#### (General English Education)

<table>
<thead>
<tr>
<th>Electives (min)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 271, Literary Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 275, Intro to Writing Studies</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 467, Capstone</td>
<td>3</td>
</tr>
<tr>
<td>Literature Survey Electives</td>
<td>6</td>
</tr>
<tr>
<td>Cultural Diversity Electives</td>
<td>6</td>
</tr>
<tr>
<td>ENGL 300-400 Electives</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

### Sample '08-09 Curriculum

#### English Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>ENGL 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 358, Writing in Hum/Soc Sci</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 209, Intro to Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 222, Intro to Poetry</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 240, World Lit Masterpieces</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 251 or 252, British Lit I or II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 261 or 262, American Lit I or II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 271, Literary Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 360, Grammatical Structure</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 380, Shakespeare</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 458, Adv Writing Workshop</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 500-400 Literature Electives</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 321, Intro to Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 322, Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 381, Early Experience</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 411, Instruc, Planning, Meth &amp; Assess</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 481, Class Prac/Meth of Teach I-Engl</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 482, Class Prac/Meth of Teach II-Engl</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 485, Student Teach Seminar</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
</tr>
</tbody>
</table>

### Additional Requirements

#### (Communication Option)

<table>
<thead>
<tr>
<th>Electives (min)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 216, Intercultural Comm</td>
<td>3</td>
</tr>
<tr>
<td>COMM 301, Rhetorical Traditions</td>
<td>3</td>
</tr>
<tr>
<td>COMM 312, Oral Performance Studies</td>
<td>3</td>
</tr>
<tr>
<td>COMM 318, Argumentation &amp; Advocacy</td>
<td>3</td>
</tr>
<tr>
<td>COMM 451, Directing Forensics</td>
<td>2</td>
</tr>
<tr>
<td>EDUC 481, Class Prac/Meth, Teach I-Comm</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>

### Sample '08-09 Curriculum

#### English Minor: Liberal Arts

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 251, 252, British Lit I &amp; II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 261, 262, American Lit I &amp; II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 271, Literary Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 358, Writing in Humanities &amp; Soc Sci</td>
<td>3</td>
</tr>
<tr>
<td>ENGL Electives</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>

### Sample '08-09 Curriculum

#### English Minor: Writing

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 275, Intro to Writing Studies</td>
<td>3</td>
</tr>
<tr>
<td>ENGL Electives</td>
<td>15</td>
</tr>
<tr>
<td>Linguistics/Literature Electives</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>

### Division of Fine Arts

http://www.ndsu.edu/finearts

The Division of Fine Arts includes the Departments of Music, Theatre Arts and Visual Arts as well as their exhibition and performance spaces. We are dedicated to excellence as we educate our students, create, and interpret works of art, and disseminate that excellence throughout the greater university community and the region.
### Department of Visual Arts

Art students develop creative technique as well as a life-long commitment to visual understanding and expression. Careers that may result from an art degree include commercial art, graphic design, animation, illustration, art marketing, commercial photography, museum/gallery work, exhibition design, independent studio art, municipal art programs, art criticism, independent art instruction, art media research, arts organizations management, arts-funding agency work, or continued study in graduate school.

A comprehensive curriculum in visual arts is offered through a highly supportive studio program augmented by academic art courses. Emphasis is placed upon developing individual concept and content within a broad context of knowledge and skills. The faculty is composed of active studio artists and an art historian, all with extensive experience in both professional and academic settings. Well-equipped facilities are maintained for drawing, painting, printmaking, photography, digital media, sculpture and ceramics. Academic facilities both in the main library and in the James Falck Departmental Library house books, videos and publications.

All Art majors develop a strong foundation in design and drawing. Then, through experiences in diverse art media, they develop an area of concentration. Motivated and successful upper-class students are eligible to compete for scholarships and individual studio space. All art students are encouraged to supplement their education with outside art experiences such as summer internships and to participate in national and international art competitions and exhibitions.

### Art Major

The Department of Visual Arts offers three undergraduate degrees: The Bachelor of Fine Arts, the Bachelor of Arts, and the Bachelor of Science. The B.F.A. is a professional degree featuring a studio art concentration, while the B.A. and B.S. are liberal arts degrees. The B.A. requires an intermediate competency in a foreign language while the B.S. requires an approved minor outside art. Both the B.A. and B.S. require studio components.

### Sample ’08-09 Curriculum

#### B.A. or B.S. - Art Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110(^i), 120, College Comp I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course(^j)</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
</tr>
</tbody>
</table>

#### College/Department Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
</tr>
<tr>
<td>Social Science Elective</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### College/Department Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
</tr>
<tr>
<td>Social Science Elective</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Major Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 122, 2-D Design</td>
</tr>
<tr>
<td>ART 124, 3-D Design</td>
</tr>
<tr>
<td>ART 210, Drawing I</td>
</tr>
<tr>
<td>ART 170, Printmaking I</td>
</tr>
<tr>
<td>ART 211, Art History I</td>
</tr>
<tr>
<td>ART 212, 2-D Design</td>
</tr>
<tr>
<td>ART 213, 3-D Design</td>
</tr>
<tr>
<td>ART 214, Drawing I</td>
</tr>
<tr>
<td>ART 215, Ceramics I</td>
</tr>
<tr>
<td>ART 355, Figure Drawing</td>
</tr>
<tr>
<td>ART 452, Contemporary Art</td>
</tr>
<tr>
<td>ART 489, Baccalaureate Project</td>
</tr>
<tr>
<td><strong>Upper Division Studio Electives</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Additional Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Electives &amp;</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Curriculum Total (min)

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>Social Science Elective</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Sample ’08-09 Curriculum

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 122, 2-D Design</td>
</tr>
<tr>
<td>ART 124, 3-D Design</td>
</tr>
<tr>
<td>ART 210, Drawing I</td>
</tr>
<tr>
<td>ART 211, 2-D Design</td>
</tr>
<tr>
<td>ART 212, 2-D Design</td>
</tr>
<tr>
<td>ART 170, Printmaking I</td>
</tr>
<tr>
<td>ART 211, Art History I</td>
</tr>
<tr>
<td>ART 212, 2-D Design</td>
</tr>
<tr>
<td>ART 213, 3-D Design</td>
</tr>
<tr>
<td>ART 214, Drawing I</td>
</tr>
<tr>
<td>ART 215, Ceramics I</td>
</tr>
<tr>
<td>ART 355, Figure Drawing</td>
</tr>
<tr>
<td>ART 452, Contemporary Art</td>
</tr>
<tr>
<td>ART 489, Baccalaureate Project</td>
</tr>
<tr>
<td><strong>Upper Division Studio Electives</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Additional Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Electives &amp;</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Curriculum Total (min)

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>Social Science Elective</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Department of Music

NDSU Music prepares students for careers in teaching, performance and/or liberal studies. It also provides creative opportunities for all talented student musicians regardless of major, and seeks to foster an appreciation of music throughout the greater NDSU community.

NDSU music is accredited by the National Association of Schools of Music. Programs of study lead to the Bachelor of Music in Performance; the professional undergraduate teaching degree in Music Education; the Bachelor of Arts or Bachelor of Science in Music; the Master of Music in Performance, Conducting, or Music Education; and the Doctor of Musical Arts in Performance or Conducting.

### Majors/Minors

Admission to music major or minor programs is arranged through an audition and interview; for information, please contact the Division of Fine Arts office. All undergraduate music majors take private lessons, participate in ensembles, and take a broad range of courses appropriate to their areas of emphasis.

The Bachelor of Music degree is for talented vocalists and instrumentalists who wish a career as a professional performer or conductor, and who will likely continue their studies in graduate school. The undergraduate degree program in Music Education is offered through the Division of Fine Arts and the School of Education, and leads to certification to teach K-12 music in North Dakota’s public schools. Certification requirements for other states vary, but North Dakota licensure is congruent with that of many other states. Those experiences in a broad spectrum of music education courses – elementary, instrumental, and voice/choral – results in NDSU’s outstanding reputation for producing teachers with excellent and versatile credentials.

Music majors pursuing a Bachelor of Arts or Bachelor of Science degree (without public school teaching certification) are generally interested in a broad liberal arts education with a significant number of electives. Music majors and minors supplement their course work by attending recitals and concerts. Those in applied study perform for the jury examination at the end of each semester. Students enrolled in private applied study also participate in a related major ensemble; pianists sometimes play with chamber ensembles or accompany ensembles.
### Ensembles
NDSU Music sponsors a large variety of ensembles including the Gold Star Concert Band, Concert Choir, Wind Ensemble, Madrigal Singers, two large Jazz Ensembles, Jazz Combos, the Gold Star Marching Band, Brass Ensemble, University Chorus, NDSU Statesmen, Cantus,Variety Band, Bison Pep Bands, Opera Theatre, and chamber ensembles in typical instrumental and vocal combinations. NDSU students may also register for the University Symphony Orchestra through the Tri-College system. The Concert Choir, Gold Star Concert Band, Jazz Ensemble, Madrigal Singers and several other groups have touring programs, some of which are national or international in scope. Participation in these ensembles is open to all students, some by audition and some as recreational ensembles.

### Music Curricula
Requirements are grouped by degree. Please refer also to graduation requirements listed in the Academic Policies section of this publication. The information in this Bulletin may be superseded by information updated regularly and provided by the Division of Fine Arts.

#### The Bachelor of Music (B.Mus.)
The professional undergraduate degree in music, the B.Mus. is designed for students pursuing a career as a performing musician. Such students often continue advanced study in graduate school. All students audition for the appropriate area of performance with faculty members and demonstrate professional level skills or potential. In addition to college and university requirements, all students take courses in the core requirements section, and then select a specialized curriculum under instrumental, voice, or piano. Bachelor of Music students are required to pass all four levels of piano proficiency examinations prior to completion of the degree. Piano credit requirements listed below may be waived in whole or in part for Vocal and Instrumental majors upon successful completion of the piano proficiency examinations.

#### Sample '08-'09 Curriculum

**Bachelor of Music**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S): GERM 1015, 1025, First-year German I, II</td>
<td>4</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A): Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B): Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D): Cultural Diversity</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G): Global Perspective</td>
<td>2</td>
</tr>
<tr>
<td>**Total:</td>
<td>40</td>
</tr>
</tbody>
</table>

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>12</td>
</tr>
</tbody>
</table>

**Major Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 103, Intro to Music History</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 130, 131, Theory &amp; Analysis I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>MUSC 132, 133, Ear Training/Sight Sing I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>MUSC 180, Performance Attendance (5 sem)</td>
<td>0</td>
</tr>
<tr>
<td>MUSC 230, 231, Theory &amp; Analysis III, IV</td>
<td>3.3</td>
</tr>
<tr>
<td>MUSC 232, 233, Ear Training/Sight Sing III, IV</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 250, Basic Conducting</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 341, Contemporary Harmonic Tech</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 340, 341, Music History I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>MUSC 411, Form &amp; Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Applied Study (various course numbers)</td>
<td>2</td>
</tr>
<tr>
<td>Pedagogy (through applied study registration)</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 380, 480, Recitals</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>57</td>
</tr>
</tbody>
</table>

**Track 1: Instrumental**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 141, Symphonic Literature</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 331, Instrumental Arranging</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 344, Wind Band Literature</td>
<td>2</td>
</tr>
<tr>
<td>Applied Piano (class or individual study)</td>
<td>4</td>
</tr>
<tr>
<td>Jazz studies (from MUSC 311, 364, 358)</td>
<td>4</td>
</tr>
<tr>
<td>Major Ensembles (from MUSC 111, 302, 303, 304, 311)</td>
<td>8</td>
</tr>
<tr>
<td>Minor Ensembles (from MUSC 312-316)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>26</td>
</tr>
</tbody>
</table>

**Track 2: Vocal**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 349, 350, Vocal Pedagogy I, II</td>
<td>2.2</td>
</tr>
<tr>
<td>MUSC 174, 175, Pronunciation for Singers I, II</td>
<td>1.1</td>
</tr>
<tr>
<td>MUSC 442, Opera Literature</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 346, Survey of Vocal Literature</td>
<td>2</td>
</tr>
<tr>
<td>Applied Piano (class or individual study)</td>
<td>4</td>
</tr>
<tr>
<td>Major Ensembles (from MUSC 115, 306)</td>
<td>8</td>
</tr>
<tr>
<td>Minor Ensembles (from MUSC 116, 117, 317-319)</td>
<td>2</td>
</tr>
<tr>
<td>FREN 101, 102, First-year French I, II</td>
<td>4.4</td>
</tr>
<tr>
<td>GERM 101, 102, First-year German I, II</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>40</td>
</tr>
</tbody>
</table>

**Track 3: Piano**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Pedagogy (thru applied study reg)</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 443, Keyboard Literature</td>
<td>2</td>
</tr>
<tr>
<td>Additional literature (from MUSC 344, 346, 441, 442)</td>
<td>2</td>
</tr>
<tr>
<td>Jazz studies (from MUSC 311, 358, 364)</td>
<td>4</td>
</tr>
<tr>
<td>Major Ensembles (from MUSC 111, 303, 306, 311)</td>
<td>4</td>
</tr>
<tr>
<td>Minor Ensembles (from MUSC 311-316)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>18</td>
</tr>
</tbody>
</table>

**Curriculum Total (min) - All Tracks:** 122

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 unless transfer credit for ENGL 120 is received.
2. Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P).
3. Students with a composite ACT score of less than 21 are required to register for English 110.

#### Sample ’08-09 Curriculum

**Music Education**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>(satisfied with major requirements)</td>
<td></td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>40</td>
</tr>
</tbody>
</table>

**Professional Education Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 321, Intro to Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 322, Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 381, Early Experience</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 481, Cncl Prac Meth, Tech I-I Mus lnstr</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 482, Cncl Prac Meth, Tech II-Mus Voc</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 483, Cncl Prac Meth, Teach III-Elem</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 485, Student Teaching Seminar</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 486, Cncl Mtg for Diverse Learners</td>
<td>2</td>
</tr>
<tr>
<td>EDUC 487, Student Teaching Elem/Secondary</td>
<td>9</td>
</tr>
<tr>
<td>EDUC 488, Applied Student Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 489, Native Amer/Multicultlnstr Pract</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>35</td>
</tr>
</tbody>
</table>

**Emphasis 1: Vocal**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 174, 175, Pronunciation for Sing I, II</td>
<td>1.1</td>
</tr>
<tr>
<td>MUSC 332, Survey of Choral Literature</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 350, Vocal Methods &amp; Pedagogy II</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 358, Jazz Methods</td>
<td>2</td>
</tr>
<tr>
<td>Applied Voice</td>
<td>2</td>
</tr>
<tr>
<td>Major Choral Ensemble</td>
<td>2</td>
</tr>
<tr>
<td>Major Instrumental Ensemble</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>24</td>
</tr>
</tbody>
</table>

**Emphasis 2: Instrumental**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 331, Instrumental Arranging</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 344, Wind Band Literature</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 354, Woodwind Methods II</td>
<td>2</td>
</tr>
</tbody>
</table>
Sample '08-09 Curriculum

Music Major

General Education Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F)</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>ENGL 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Applied Major Instrument</td>
<td>7</td>
</tr>
<tr>
<td>Major Choral Ensemble</td>
<td>2</td>
</tr>
<tr>
<td>Major Instrumental Ensemble</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1101, 120, College Comp I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
</tr>
</tbody>
</table>

Music Minors

Three minors are offered – one for the general student, one specifically designed for the education major, and one for students interested in musical theatre.

Sample '08-09 Curriculum

General Music Minor

Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 103, Introduction to Music History</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 130, 131, Theory &amp; Analysis I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>MUSC 132, 133, Ear Training/Sight Singing I, II</td>
<td>1,1</td>
</tr>
<tr>
<td>Major Ensemble (2 semesters)</td>
<td>1,1</td>
</tr>
<tr>
<td>Music Electives</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
</tr>
</tbody>
</table>

Sample '08-09 Curriculum

Music Minor for Education Majors

Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 103, Introduction to Music History</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 130, 131, Theory &amp; Analysis I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>MUSC 132, 133, Ear Training/Sight Singing I, II</td>
<td>1,1</td>
</tr>
<tr>
<td>Major Ensemble (2 semesters)</td>
<td>1,1</td>
</tr>
<tr>
<td>EDUC 483, Clrm Prac/Meth of Tch-Elem</td>
<td>2-3</td>
</tr>
<tr>
<td>MUSC 349, Vocal Methods &amp; Pedagogy I</td>
<td></td>
</tr>
<tr>
<td>MUSC 353, Woodwind Methods I</td>
<td></td>
</tr>
<tr>
<td>MUSC 355, Brass Methods I</td>
<td></td>
</tr>
<tr>
<td>MUSC 359, Percussion Methods</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>21-22</td>
</tr>
</tbody>
</table>

Department of Theatre Arts

Programs of study in theatre arts lead to the Bachelor of Science, Bachelor of Arts, and Bachelor of Fine Arts degrees. The requirements for all degree tracks prepare students to be versatile life-long theatre artists through a rigorous, broad-based curriculum in theatre practice, theory, and history. Additional opportunities for specialized study are provided in the areas of acting, musical theatre, design/technology. Through the course work students are given the opportunity to prepare audition material and/or portfolios necessary to enter professional theatre regionally and nationally.

Little Country Theatre (LCT), the producing arm of Theatre Arts, has been an important part of campus life at NDSU since 1914 and is the oldest theatre in the state. LCT produces four plays each year – plays that challenge and enrich the mind, talent, and imagination. Productions are chosen in such a way to expose the students to a variety of styles and genres through a four-year rotation of play styles. Students gain practical experiences through LCT which reflect the best of professional practices and current technology. In addition to academic course work, every theatre major is required to participate in some way in at least one LCT production per semester. Participation in LCT is open to all NDSU students regardless of major.

The Department of Theatre Arts is accredited by the National Association of Theatre Schools (NAST). It is also an active participant in the Kennedy Center American College Theatre Festival (KCACTF). The department also hosts a student chapter of the United States Institute for Theatre Technology (USITT).

The Bachelor of Arts (B.A.) and the Bachelor of Science (B.S.) with a major in Theatre Arts are general baccalaureate degrees providing a liberal arts background with major emphasis in theatre. Two years of a foreign language are required for the B.A. degree, while an approved minor area is required for the B.S. degree. The Bachelor of Fine Arts (B.F.A.) with a major in Theatre Arts is a professionally-oriented program and can be entered only by faculty approval, usually at the end of the sophomore year. This degree program provides in-depth study of a theatre specialization and related fine arts fields.

A minor in Theatre Arts is available with a general studies emphasis or with an emphasis either in general theatrical design and technical theatre, scenic design and technology, costume design and technology, musical theatre, or in performance (acting and directing).

A student who wishes to teach theatre in high school should select a teaching major approved by the School of Education and supplement that major with a major or minor in Theatre Arts. Courses for theatre arts majors and minors are grouped into tracks and emphasis areas. In addition to college and university requirements, (see graduation requirements listed in the Academic Policies section), the following courses are required:

Sample '08-09 Curriculum

Bachelor of Arts or Bachelor of Science

Theatre Arts Major

General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 101, Fundamentals of Music</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 103, Introduction to Music History</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 130, 131, Theory &amp; Analysis I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>MUSC 132, 133, Ear Training/Sight Singing I, II</td>
<td>1,1</td>
</tr>
<tr>
<td>MUSC 160, Piano Class</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 162, Voice Class</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 167, Applied Voice (2 semesters)</td>
<td>2</td>
</tr>
<tr>
<td>MUSC 301, Musical Theatre Troupe</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 301, Musical Theatre Troupe</td>
<td>1</td>
</tr>
<tr>
<td>MUSC 228, Development of Musical Theatre</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>18-23</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSC 103, Intro to Music History</td>
<td>3</td>
</tr>
<tr>
<td>MUSC 130, 131, Theory &amp; Analysis I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>MUSC 132, 133, Ear Training/Sight Singing I, II</td>
<td>1,1</td>
</tr>
<tr>
<td>MUSC 180, Performance Attendance</td>
<td>0</td>
</tr>
<tr>
<td>MUSC 230, 231, Theory &amp; Analysis III, IV</td>
<td>3,3</td>
</tr>
<tr>
<td>MUSC 232, 233, Ear Training/Sight Singing III, IV</td>
<td>1,1</td>
</tr>
<tr>
<td>MUSC 340, 341, Music History I, II</td>
<td></td>
</tr>
<tr>
<td>Applied Music</td>
<td>6</td>
</tr>
<tr>
<td>Major Ensembles</td>
<td>6</td>
</tr>
<tr>
<td>Music Electives or Emphasis Courses</td>
<td>18-22</td>
</tr>
<tr>
<td>Electives (to get at least 2 credits)</td>
<td>55</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 180, Dramatic Lit &amp; Style</td>
<td>3</td>
</tr>
<tr>
<td>THEA 265, Script Analysis</td>
<td>3</td>
</tr>
<tr>
<td>THEA 273, Stagecraft</td>
<td>3</td>
</tr>
<tr>
<td>THEA 274, Intro to Stage Design</td>
<td>3</td>
</tr>
<tr>
<td>THEA 275, Theatrical Makeup Design</td>
<td>3</td>
</tr>
<tr>
<td>THEA 280, World Theatre</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

Major/Related Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 161, Acting I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 180, Dramatic Lit &amp; Style</td>
<td>3</td>
</tr>
<tr>
<td>THEA 265, Script Analysis</td>
<td>3</td>
</tr>
<tr>
<td>THEA 273, Stagecraft</td>
<td>3</td>
</tr>
<tr>
<td>THEA 274, Intro to Stage Design</td>
<td>3</td>
</tr>
<tr>
<td>THEA 275, Theatrical Makeup Design</td>
<td>3</td>
</tr>
<tr>
<td>THEA 280, World Theatre</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
</tr>
</tbody>
</table>
### Sample '08-'09 Curriculum

#### Theatre Arts Major: Performance Track & Design and Technical Theatre Track

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A):</td>
<td>3</td>
</tr>
<tr>
<td>ART 111, Intro to Art History</td>
<td></td>
</tr>
<tr>
<td>MUSC 100, Music Appreciation</td>
<td>3</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>THEA 280, World Theatre</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td>ART 111, Intro to Art History</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>College/Department Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective.</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective.</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts Elective.</td>
<td>3</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEA 161, Acting I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 180, Dramatic Lit &amp; Style</td>
<td>3</td>
</tr>
<tr>
<td>THEA 265, Script Analysis</td>
<td>3</td>
</tr>
<tr>
<td>THEA 273, Stagescraft</td>
<td>3</td>
</tr>
<tr>
<td>THEA 274, Intro to Stage Design</td>
<td>3</td>
</tr>
<tr>
<td>THEA 275, Theatrical Makeup Design</td>
<td>3</td>
</tr>
<tr>
<td>THEA 280, World Theatre</td>
<td>3</td>
</tr>
<tr>
<td>THEA 372, Stage Management</td>
<td>3</td>
</tr>
<tr>
<td>THEA 450, Capstone Experience</td>
<td>3</td>
</tr>
<tr>
<td>THEA 480, History &amp; Lit of Theatre I</td>
<td>3</td>
</tr>
<tr>
<td>THEA 481, History &amp; Lit of Theatre II</td>
<td>3</td>
</tr>
<tr>
<td>THEA 201-204, Theatre Practicum</td>
<td>6</td>
</tr>
<tr>
<td>THEA 101, Department Participation</td>
<td>0</td>
</tr>
<tr>
<td>ENGL 380, Shakespeare</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

#### Theatre Arts Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theatre Appreciation (two of the following):</td>
<td>6</td>
</tr>
<tr>
<td>THEA 110, Intro to Theatre Arts</td>
<td>3</td>
</tr>
<tr>
<td>THEA 180, Dramatic Lit &amp; Style</td>
<td>3</td>
</tr>
<tr>
<td>THEA 280, World Theatre</td>
<td>3</td>
</tr>
<tr>
<td>THEA 201-204, Theatre Practicum</td>
<td>2</td>
</tr>
<tr>
<td>THEA Electives 1</td>
<td></td>
</tr>
</tbody>
</table>

#### Musical Theatre

Contact the Division of Fine Arts for detailed curricula.

#### Department of History, Philosophy, and Religious Studies

**www.ndsu.edu/history**

By engaging in the fascinating study of how people in the past understood their worlds, graduates from the Department of History, Philosophy, and Religious Studies will be prepared to comprehend and think critically about the present by understanding how it has been shaped by the past. In their studies they will learn how to evaluate the strengths and weaknesses of alternative explanations for historical events, how to interpret primary and secondary materials to form valid conclusions, how to analyze components of historical events, and how to synthesize and apply their knowledge in an original research project.

The Department of History, Philosophy, and Religious Studies offers both a B.A. and a B.S. degree in History. The B.A. degree requires the completion of two years of a foreign language at the college level and is recommended for students desiring a rich level arts education or planning for graduate school or law school. The B.S. degree does not have a foreign language requirement but, instead, requires an appropriate minor. Students transferring to NDSU must complete at least 50 percent of their history credits at North Dakota State University. A History Education program of study also is offered between the Department of History, Philosophy, and Religious Studies and the School of Education.

Both the B.A. and the B.S. degree require 39 credits in history distributed as follows:

**B.A. or B.S. in History**

- 100-200 level courses (9-15 credits)
- **300-400 level courses (at least 24 credit total)** including the following:
  - HIST 390, Historical Research and Writing (3 credits)
  - HIST 489, Senior Seminar (3 credits)

**Distribution requirement (6+6+3 distributed among the following categories):**

- US History, 300-400 level
- European History, 300-400 level
- Widening Horizons, 300-400 level
- **300-400 level sequence (6 credits) in one distribution category**
- History electives at the 300-400 level (3-9 credits)

Lists of approved courses for the distribution and sequence requirements are on the department Web site.

#### Sample '08-'09 Curriculum

<table>
<thead>
<tr>
<th>History Major</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>College/Department Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective.</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective.</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts Elective.</td>
<td>3</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major/Related Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 100-200 Level Electives</td>
<td>9</td>
</tr>
<tr>
<td>HIST 390, Historical Research &amp; Writing</td>
<td>3</td>
</tr>
<tr>
<td>HIST 489, Senior Seminar (Capstone)</td>
<td>3</td>
</tr>
<tr>
<td>HIST 300-400 Level Electives</td>
<td>15</td>
</tr>
<tr>
<td>Additional HIST Electives</td>
<td></td>
</tr>
<tr>
<td>Electives (to get to 122 credits)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
</tr>
</tbody>
</table>

| Curriculum Total (min) | **122** |
Sample '08-'09 Curriculum

History Education Major

General Education Requirements

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>HIST 100-200 Level Electives(^1)</td>
</tr>
<tr>
<td>9</td>
<td>HIST 390, Historical Research &amp; Writing</td>
</tr>
<tr>
<td>3</td>
<td>HIST 489, Senior Seminar (Capstone)</td>
</tr>
<tr>
<td>9</td>
<td>HIST 300-400 Level Electives(^2)</td>
</tr>
<tr>
<td>15</td>
<td>HIST Distribution Electives(^3)</td>
</tr>
<tr>
<td>12</td>
<td>Major/Minor/Electives (min.)</td>
</tr>
<tr>
<td>71</td>
<td>Total</td>
</tr>
</tbody>
</table>

Professional Education Requirements

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>EDUC 321, Intro to Teaching</td>
</tr>
<tr>
<td>3</td>
<td>EDUC 322, Educational Psychology</td>
</tr>
<tr>
<td>1</td>
<td>EDUC 381, Early Experience</td>
</tr>
<tr>
<td>3</td>
<td>EDUC 451, Instruc, Planning, Meth &amp; Assess</td>
</tr>
<tr>
<td>3</td>
<td>EDUC 481, Clmr Prac/Meth of Teach I-Soc Sci</td>
</tr>
<tr>
<td>3</td>
<td>EDUC 485, Student Teach Seminar</td>
</tr>
<tr>
<td>2</td>
<td>EDUC 486, Clmr Mgt of Diverse Learners</td>
</tr>
<tr>
<td>2</td>
<td>EDUC 487, Student Teach Elem/Secondary</td>
</tr>
<tr>
<td>3</td>
<td>EDUC 488, Applied Student Teaching</td>
</tr>
<tr>
<td>3</td>
<td>EDUC 489, Nat American/Multicult Inst Prac</td>
</tr>
<tr>
<td>30</td>
<td>Total</td>
</tr>
</tbody>
</table>

Curriculum Total (min.)  \(122\)

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade. (P). Students with a composite ACT score of less than 21 are required to register for English 110</td>
</tr>
<tr>
<td>2</td>
<td>Refer to department or curriculum guide for course options</td>
</tr>
<tr>
<td>3</td>
<td>May double count with select Humanities &amp; Fine Arts, Social &amp; Behavioral Science and/or Science &amp; Tech Gen Ed courses.</td>
</tr>
</tbody>
</table>

B.A. or B.S. in History and History Education

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communications (C):</td>
</tr>
<tr>
<td>3</td>
<td>COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>3</td>
<td>ENGL 110(^1), 120, College Comp I, II</td>
</tr>
<tr>
<td>3</td>
<td>ENGL 358, Writing in Hum/Sci Soc</td>
</tr>
<tr>
<td>3</td>
<td>Quantitative Reasoning (R)</td>
</tr>
<tr>
<td>6</td>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>6</td>
<td>Wellness (W)</td>
</tr>
<tr>
<td>1</td>
<td>Cultural Diversity (D)(^1)</td>
</tr>
<tr>
<td>1</td>
<td>Global Perspective (G)(^2)</td>
</tr>
<tr>
<td>40</td>
<td>Total</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Humanities Elective</td>
</tr>
<tr>
<td>3</td>
<td>Social Science Elective</td>
</tr>
<tr>
<td>3</td>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>3</td>
<td>AHSS Elective (outside of major area)</td>
</tr>
<tr>
<td>72</td>
<td>Total</td>
</tr>
</tbody>
</table>

History Minor

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Students who minor in History are required to complete 9 credits of 100-200 level courses and 9 credits of 300-400 level courses</td>
</tr>
</tbody>
</table>

Humanities/Philosophy

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Humanities and/or Philosophy</td>
</tr>
<tr>
<td>6</td>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>2</td>
<td>Wellness (W)</td>
</tr>
<tr>
<td>10</td>
<td>Cultural Diversity (D)(^1)</td>
</tr>
<tr>
<td>6</td>
<td>Global Perspective (G)(^2)</td>
</tr>
<tr>
<td>36</td>
<td>Total</td>
</tr>
</tbody>
</table>

Sample '08-'09 Curriculum

Public History Major

General Education Requirements

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>ENGL 110, Skills for Academic Success</td>
</tr>
<tr>
<td>3</td>
<td>Communications (C):</td>
</tr>
<tr>
<td>9</td>
<td>ENGL 110(^1), 120, College Comp I, II</td>
</tr>
<tr>
<td>9</td>
<td>ENGL Upper Level Writing Course(^3)</td>
</tr>
<tr>
<td>10</td>
<td>Quantitative Reasoning (R)</td>
</tr>
<tr>
<td>6</td>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>2</td>
<td>Wellness (W)</td>
</tr>
<tr>
<td>2</td>
<td>Cultural Diversity (D)(^1)</td>
</tr>
<tr>
<td>2</td>
<td>Global Perspective (G)(^2)</td>
</tr>
<tr>
<td>40</td>
<td>Total</td>
</tr>
</tbody>
</table>

History majors can prepare themselves for careers in secondary education by completing a double major with either a B.A. or B.S. in History with a second major in History Education. Students selecting the B.A. option will need two years of a foreign language. The department advises students to choose History as their primary major. History Education majors are required to complete a course in North Dakota history and three credits of history other than European or United States. They must also complete one 200-level or above course in anthropology, geography, political science, psychology, or sociology.

The double major in History and History Education requires 39 credits in history distributed as follows:

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Students with a composite ACT score of less than 21 are required to register for English 110</td>
</tr>
<tr>
<td>2</td>
<td>Refer to department or curriculum guide for course options</td>
</tr>
<tr>
<td>3</td>
<td>May double count with select Humanities &amp; Fine Arts, Social &amp; Behavioral Science and/or Science &amp; Tech Gen Ed courses.</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Humanities Elective</td>
</tr>
<tr>
<td>3</td>
<td>Social Science Elective</td>
</tr>
<tr>
<td>3</td>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>3</td>
<td>AHSS Elective (outside of major area)</td>
</tr>
<tr>
<td>72</td>
<td>Total</td>
</tr>
</tbody>
</table>

Humanities Major

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Humanities and/or Philosophy</td>
</tr>
<tr>
<td>6</td>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>2</td>
<td>Wellness (W)</td>
</tr>
<tr>
<td>10</td>
<td>Cultural Diversity (D)(^1)</td>
</tr>
<tr>
<td>6</td>
<td>Global Perspective (G)(^2)</td>
</tr>
<tr>
<td>36</td>
<td>Total</td>
</tr>
</tbody>
</table>

Sample '08-'09 Curriculum

Humanities Major

General Education Requirements

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>ENGL 110, Skills for Academic Success</td>
</tr>
<tr>
<td>3</td>
<td>Communications (C):</td>
</tr>
<tr>
<td>9</td>
<td>ENGL 110(^1), 120, College Comp I, II</td>
</tr>
<tr>
<td>9</td>
<td>ENGL Upper Level Writing Course(^3)</td>
</tr>
<tr>
<td>10</td>
<td>Quantitative Reasoning (R)</td>
</tr>
<tr>
<td>6</td>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>2</td>
<td>Wellness (W)</td>
</tr>
<tr>
<td>2</td>
<td>Cultural Diversity (D)(^1)</td>
</tr>
<tr>
<td>2</td>
<td>Global Perspective (G)(^2)</td>
</tr>
<tr>
<td>40</td>
<td>Total</td>
</tr>
</tbody>
</table>

History majors can prepare themselves for careers in secondary education by completing a double major with either a B.A. or B.S. in History with a second major in History Education. Students selecting the B.A. option will need two years of a foreign language. The department advises students to choose History as their primary major. History Education majors are required to complete a course in North Dakota history and three credits of history other than European or United States. They must also complete one 200-level or above course in anthropology, geography, political science, psychology, or sociology.

The double major in History and History Education requires 39 credits in history distributed as follows:

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Students with a composite ACT score of less than 21 are required to register for English 110</td>
</tr>
<tr>
<td>2</td>
<td>Refer to department or curriculum guide for course options</td>
</tr>
<tr>
<td>3</td>
<td>May double count with select Humanities &amp; Fine Arts, Social &amp; Behavioral Science and/or Science &amp; Tech Gen Ed courses.</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Humanities Elective</td>
</tr>
<tr>
<td>3</td>
<td>Social Science Elective</td>
</tr>
<tr>
<td>3</td>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>3</td>
<td>AHSS Elective (outside of major area)</td>
</tr>
<tr>
<td>72</td>
<td>Total</td>
</tr>
</tbody>
</table>

Humanities Major

<table>
<thead>
<tr>
<th>Credits</th>
<th>Major/Related Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Humanities and/or Philosophy</td>
</tr>
<tr>
<td>6</td>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>2</td>
<td>Wellness (W)</td>
</tr>
<tr>
<td>10</td>
<td>Cultural Diversity (D)(^1)</td>
</tr>
<tr>
<td>6</td>
<td>Global Perspective (G)(^2)</td>
</tr>
<tr>
<td>36</td>
<td>Total</td>
</tr>
</tbody>
</table>
College/Department Requirements

Humanities Elective ........................................ 3
Social Science Elective ..................................... 3
Fine Arts Elective ........................................... 3
AHSS Elective (outside of major area) ...................... 3
Total .......................................................... 12

Major/Related Requirements

ENGL 240, World Literature Masterpieces .................. 3
ENGL 335, Multicultural Writers or
HUM 385, Comparative Arts .................................. 3
Interdisciplinary 400-level Course2 .......................... 3
Fine Arts/Religion Electives .................................. 6
History/Literature Electives .................................... 6
Philosophy/Architecture Electives ............................. 6
Humanities Tutorial1 ............................................ 3-6
300-400 Level Major Electives ................................. 6-9
Two years of a Foreign Language ............................. 39
Additional Requirements

Credits
Free Electives (for degree completion) ...................... 31
Total .......................................................... 72
Curriculum Total (min) ........................................ 122

Sample '08-09 Curriculum

Humanities Minor
The Humanities minor is designed to stimulate creative expression and complement a major field of study. The minor consists of 21 credits distributed among the following requirements:

Requirements

ENGL 240, World Literature Masterpieces .................. 3
ENGL 335, Multicultural Writers ................................ 3
Upper Level Humanities Sequences .......................... 12
UNIV 402, Power of Narrative or
UNIV 403, Weighing the Evidence or
UNIV 404, Spot Conflicts in Glob Soc or
approved interdisciplinary course ........................... 3
Total .......................................................... 21

Philosophy-Humanities
People have always had questions about the world in which they live. Whether these questions are about truth, beauty, and goodness, or about whether life has any meaning, people find questions to ask. Over the centuries, many minds have addressed these questions. By means of dialogue, intuition, logic, and critical thought, philosophers have created pathways to wisdom and an understanding of the human condition.

North Dakota State University, through a cooperative arrangement with Cardinal Muench Seminary, offers students a Philosophy curriculum that may be approached either as an interdisciplinary Philosophy minor or a Philosophy-Humanities minor or major.

The Philosophy-Humanities major consists of 30 semester credits. Of these, 21 credits must be taken from the required courses below. Nine elective credits, which can be independent studies, complete the major. The major can result in either a B.A. or B.S. degree. Each degree has additional university and College of Arts, Humanities and Social Sciences requirements that must be fulfilled. For example, a B.A. requires two years or the equivalent of a foreign language, while the B.S. requires a minor in another field. Please check the university and college pages addressing additional requirements that must be fulfilled.

Sample '08-09 Curriculum

Philosophy-Humanities Major

General Education Requirements

Credits
First Year Experience (F):
UNIV 189, Skills for Academic Success .................... 1
Communications (C):
COMM 110, Fund of Public Speaking ........................ 3
ENGL 1101, 120, College Comp I, II ........................ 3-3
ENGL Upper Level Writing Course ........................ 3
Quantitative Reasoning (R) .................................. 3
Science & Technology (S) .................................... 10
Humanities & Fine Arts (A) ................................... 6
Including: PHIL 101, Intro to Humanities
Social & Behavioral Sciences .................................. 6
Wellness (W) ................................................... 2
Cultural Diversity (D) ........................................... 6
Global Perspective (G) ........................................... 1
Total .......................................................... 40

College/Department Requirements

Philosophy-Humanities Elective ................................. 3
Social Science Elective ....................................... 3
Fine Arts Elective ............................................. 3
AHSS Elective (outside of major area) ......................... 3
Total .......................................................... 72

Major/Related Requirements

PHIL/HUM 257, Traditional Logic ........................... 3
PHIL 101, Intro to Humanities or
HUM 256, Questions of Philosophy ........................ 3
PHIL/RELS 210, Intro to Ethics or
HUM 357, The Acting Person (Ethics) ....................... 3
PHIL 322, Medieval Philosophy .............................. 3
HUM 356, Ancient Philosophy or
HUM 357, Medieval Philosophy .............................. 3
PHIL 323, Modern Philosophy or
PHIL/HUM 476, Hist of Phil: Modern Period or
PHIL/HUM 477, Contemp Phil ............................... 3
PHIL/HUM 366, Metaphysics or
HUM 488, Epistemology ..................................... 3
PHIL/HUM 486, Philosophy & Literature or
PHIL/HUM 487, Aesthetics or
PHIL/HUM 494, Independent Study ......................... 3
PHIL/HUM Electives ........................................ 9
Total .......................................................... 50

Additional Requirements

Credits
Free Electives (for degree completion) ...................... 40
Total .......................................................... 40
Curriculum Total (min) ........................................ 122

Sample '08-09 Curriculum

Philosophy/Humanities Minor

Requirements

PHIL 101, Intro to Humanities or
HUM 256, Questions of Philosophy ........................ 3
PHIL/HUM 257, Traditional Logic ........................... 3
PHIL/RELS 210, Intro to Ethics or
HUM 357, The Acting Person (Ethics) ....................... 3
PHIL/HUM 366, Metaphysics or
HUM 488, Epistemology ..................................... 3
PHIL/HUM 486, Philosophy & Literature or
PHIL/HUM 487, Aesthetics or
PHIL/HUM 494, Independent Study ......................... 3
PHIL/HUM Electives ........................................ 9
Total .......................................................... 50

Additional Requirements

Credits
Free Electives (for degree completion) ...................... 40
Total .......................................................... 40
Curriculum Total (min) ........................................ 122

Sample '08-09 Curriculum

Classical Language Major

General Education Requirements

Credits
First Year Experience (F):
UNIV 189, Skills for Academic Success .................... 1
Communications (C):
COMM 110, Fund of Public Speaking ........................ 3
ENGL 1101, 120, College Comp I, II ........................ 3-3
ENGL 358, Writing in Hum/Soc Sci .......................... 3
Quantitative Reasoning (R) .................................. 3
Science & Technology (S) .................................... 10
Humanities & Fine Arts (A) ................................... 6
Including: CLAS 151, First-Year Greek I
Social & Behavioral Sciences .................................. 6

1 Refer to department or curriculum guide for course options.

Independent Study

Independent study may be pursued by students wanting to read a special philosophical topic (e.g. aesthetics) or read the work of a particular philosopher. To initiate independent study, the student must contact a member of the faculty listed above.

Religious Studies

From 1932 to 1977 the School of Religion was independent from the university but in close association with it. Currently, Religion Studies continues as a part of the College of Arts, Humanities and Social Sciences.

Religious Studies Minor

A minor in Religious Studies is available. The minor consists of 20 credits of which 12 credits must be at the 100-200 level and eight credits must be at the 300-400 level. For advice on the distribution of the remainder of the electives, consult with the department.

Seminary — Cardinal Muench

The Cardinal Muench Seminary is a private institution in Fargo. The program of courses offered at and by the seminary supplements the course offerings of the College of Arts, Humanities and Social Sciences at NDSU. The seminary is primarily intended to prepare students to enter any recognized school of divinity after the completion of the general requirements for graduation. Most course offerings at the seminary also are open to NDSU students for the enrichment of cultural, linguistic, or philosophical programs of studies and, at the discretion of the student’s college, for major degree programs.

In addition to other university requirements, a major in classical languages is a minimum of 30 credits in Latin and Greek (excluding 100-level Latin courses) including a minimum of eight credits in Greek. A minor in classical languages is 20 credits (excluding 100-level Latin courses) including a minimum of eight credits in Greek. A minor in Biblical languages is 20 credits of at least six credits in Hebrew and eight credits in Greek.

Sample '08-09 Curriculum
### College/Department Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
</tr>
<tr>
<td>Social Science Elective</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
</tr>
<tr>
<td>Major Electives</td>
</tr>
</tbody>
</table>

### Major/Related Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1101, 120, College Comp I, II</td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
</tr>
</tbody>
</table>

### General Education Requirements Credits

<table>
<thead>
<tr>
<th>Social Science</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education Major</td>
<td>30</td>
</tr>
</tbody>
</table>

**Sample ‘08-09 Curriculum**

### Social Science Major

A special interdisciplinary Social Science major is available. It includes courses from disciplines such as history, economics, political science, geography, psychology, sociology, or anthropology. Students should obtain the appropriate curriculum sheets from the School of Education, Office of Registration and Records, or the Arts, Humanities and Social Sciences Dean’s Office.

Before taking advanced course work required for the Social Science major, the student should complete at least one year in each of the required disciplines. In addition, students should complete course work in economics and world history.

Students who wish to prepare for high school teaching should make this intention known to the School of Education before entering their junior year to ensure that state teacher certification requirements are met.

Students not planning to teach may major in Social Science leading to either the B.A. or B.S. degree. These students should declare their majors at the Office of Registration and Records and be assigned advisors with whom they will plan programs of study. The advisor and the Office of Registration and Records must approve the program of study in advance.

### Sample ’08-09 Curriculum

#### Social Science Education Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F)</td>
<td>1</td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
</tbody>
</table>

**Communications (C):**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 358, Writing in Hum/Soc Sci</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
</tbody>
</table>

Social & Behavioral Sciences (B)

- (satisfied with major requirements)

Wellness (W)

- Cultural Diversity (D)

- Global Perspective (G)

### Major/Related Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 456, Europe 1815-1914</td>
</tr>
<tr>
<td>HIST 457, Europe Since 1914</td>
</tr>
<tr>
<td>HIST Electives</td>
</tr>
<tr>
<td>HIST 400 level U.S. Sequence</td>
</tr>
<tr>
<td>ANTH/SOC/PSCYC Sequence</td>
</tr>
<tr>
<td>POLS/GEOG/ECON Sequence</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

### Professional Education Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 321, Intro to Teaching</td>
</tr>
<tr>
<td>EDUC 322, Educational Psychology</td>
</tr>
<tr>
<td>EDUC 381, Early Experience</td>
</tr>
<tr>
<td>EDUC 451, Instruc, Planning, Meth &amp; Assess</td>
</tr>
<tr>
<td>EDUC 481, Classroom Prac/Meth of Teach I-Social Sciences</td>
</tr>
<tr>
<td>EDUC 485, Student Teach Seminar</td>
</tr>
<tr>
<td>EDUC 486, Classroom Mgt of Diverse Learners</td>
</tr>
<tr>
<td>EDUC 487, Student Teaching</td>
</tr>
<tr>
<td>EDUC 488, Applied Student Teaching</td>
</tr>
<tr>
<td>EDUC 489, Nat American/Multicult Prac</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

### Additional Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Electives (for degree completion)</td>
</tr>
</tbody>
</table>

| Curriculum Total | 126 |

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.


3. Refer to department or curriculum guide for course options.

### Department of Modern Languages

**www.ndsu.edu/modernlanguages**

Today’s interconnected world generates the need to be able to communicate in more than one language. As networks of international cooperation and exchange grow in complexity, particularly among governments and businesses, those who possess foreign language competence become increasingly valuable. Moreover, it has been shown that learning a second language can improve one’s overall writing and speaking ability.

The Department of Modern Languages offers major programs in French and Spanish, with courses in German and Arabic. Study Abroad and the experience of living in another culture are an integral part of majoring in languages at North Dakota State University. Through the ‘Tri College University consortium, NDSU students may also study Chinese, Japanese, Norwegian, and Russian for full credit. Classical languages are available in cooperation with Cardinal Muench Seminary.

In addition, degree programs in French Education and Spanish Education are offered between the Department of Modern Languages and the School of Education.

### Language Placement

Students must adhere to the placement requirements when enrolling in a language course for the first time at NDSU. If, after appropriate placement, the student’s instructor recommends that because of exceptional circumstances the student should be placed at a lower level, full credit at the new level may be granted.

### Credit for Advanced Language Placement

A student placed at an advanced level may receive NDSU credit for those courses waived, upon fulfillment of the following conditions.

1. The student has completed no previous college-level credit in that language.
2. The student enrolls consecutively in at least two courses within the same level, i.e., 201-202, (intermediate); 311-312, (advanced); and receives grades of B or better, (courses may not be taken pass/fail);
3. The student submits a petition form obtained from the Department of Modern Languages, signed by the instructor and the department chair.

### Major and Minor Programs

Language majors and minors may be obtained in French and Spanish. German is available through the third-year level.

A French major consists of a minimum of 27 credits above the intermediate level and a Spanish major consists of a minimum of 24 credits above the Intermediate level. At least nine of these credits must be in advanced language; the remainder may be chosen from a variety of courses in linguistics, literature, and culture. A minimum of one year of a second foreign language at NDSU, or the equivalent, is required. French and Spanish majors must earn a minimum grade of a “B” for courses in the major, including credits received for study abroad. Junior and senior year course work will be determined in consultation with a faculty advisor according to the student’s background and interests.

A minor necessitates completion of a minimum of 18 credits beyond the intermediate level. At least nine of these credits must be in advanced language (normally conversation/composition).
### Sample '08-'09 Curriculum

#### French Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F)</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>ENG 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 100, College Comp I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>FREN 360, Studies in Language &amp; Style</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

**Major Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 311, French Conversation &amp; Comp I</td>
<td>3</td>
</tr>
<tr>
<td>FREN 312, French Conversation &amp; Comp II</td>
<td>3</td>
</tr>
<tr>
<td>FREN 315, Contemporary France</td>
<td>3</td>
</tr>
<tr>
<td>FREN 350, Intro to French Ling &amp; Pronunciation</td>
<td>3</td>
</tr>
<tr>
<td>FREN 401, Approaches to Literature</td>
<td>3</td>
</tr>
<tr>
<td>FREN Electives</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

**Professional Education Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 321, Intro to Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 322, Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 381, Early Experience</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 451, Instruc, Planning, Meth &amp; Assess</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 481, Classroom Prac/Meth of Teach I-Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 485, Student Teach Seminar</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 486, Classr Mgt of Diverse Learners</td>
<td>2</td>
</tr>
<tr>
<td>EDUC 487, Student Teaching</td>
<td>9</td>
</tr>
<tr>
<td>EDUC 488, Applied Student Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 489, Nat American/Multicult Inst Prac</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

**Additional Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 492, Study Abroad or FREN 489, Senior Thesis</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 492, Study Abroad</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 492, Study Abroad</td>
<td>3</td>
</tr>
<tr>
<td>SPAN Electives</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

**Sample '08-'09 Curriculum

#### Spanish Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F)</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>ENG 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 100, College Comp I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>FREN 360, Studies in Language &amp; Style</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

**Major Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 311, French Conversation &amp; Comp I</td>
<td>3</td>
</tr>
<tr>
<td>FREN 312, French Conversation &amp; Comp II</td>
<td>3</td>
</tr>
<tr>
<td>FREN 315, Contemporary France</td>
<td>3</td>
</tr>
<tr>
<td>FREN 350, Intro to French Ling &amp; Pronunciation</td>
<td>3</td>
</tr>
<tr>
<td>FREN 401, Approaches to Literature</td>
<td>3</td>
</tr>
<tr>
<td>FREN Electives</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

**Professional Education Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 321, Intro to Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 322, Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 381, Early Experience</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 451, Instruc, Planning, Meth &amp; Assess</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 481, Classroom Prac/Meth of Teach I-Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 485, Student Teach Seminar</td>
<td>1</td>
</tr>
<tr>
<td>EDUC 486, Classr Mgt of Diverse Learners</td>
<td>2</td>
</tr>
<tr>
<td>EDUC 487, Student Teaching</td>
<td>9</td>
</tr>
<tr>
<td>EDUC 488, Applied Student Teaching</td>
<td>3</td>
</tr>
<tr>
<td>EDUC 489, Nat American/Multicult Inst Prac</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

**Additional Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 492, Study Abroad or FREN 489, Senior Thesis</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 492, Study Abroad</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 492, Study Abroad</td>
<td>3</td>
</tr>
<tr>
<td>SPAN Electives</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

**Sample '08-'09 Curriculum

#### Spanish Minor

**Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 311, French Conversation &amp; Comp I</td>
<td>3</td>
</tr>
<tr>
<td>FREN 312, French Conversation &amp; Comp II</td>
<td>3</td>
</tr>
<tr>
<td>FREN 315, Contemporary France</td>
<td>3</td>
</tr>
<tr>
<td>FREN 350, Intro to French Ling &amp; Pronunciation</td>
<td>3</td>
</tr>
<tr>
<td>FREN 401, Approaches to Literature</td>
<td>3</td>
</tr>
<tr>
<td>FREN Electives</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

**Additional Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 492, Study Abroad or FREN 489, Senior Thesis</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 492, Study Abroad</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 492, Study Abroad</td>
<td>3</td>
</tr>
<tr>
<td>SPAN Electives</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>
Career Directions
Experience has shown that many students, with or without declared modern language majors or minors, find a second language background especially useful when combined with preparation in another professional field. Examples include public relations, journalism, TV and radio broadcasting, hotel management, publishing and editing, government service, banking, and management.

One of the more promising occupational fields for language students has been international business. Individuals with foreign language skills are finding increased opportunities with multinational corporations, especially in management and marketing. Many companies with international ties recruit candidates possessing linguistic training because they recognize its correlation with effective verbal and written communication. Regardless of their specific majors, students are encouraged to contact the department for information and advice on career application of foreign language skills.

Students wishing to prepare for high school teaching should make this intention known to the School of Education and to the Department of Modern Languages to make certain that the requirements for state certification are met. Competitiveness and flexibility in the job market tend to be greater if certification can be obtained in two or more different areas.

**Department of Sociology, Anthropology, and Emergency Management**

www.ndsu.edu/socanth

The Department of Sociology, Anthropology, and Emergency Management offers courses and programs that focus on the study of human behavior in social settings. The department offers a major and minor in emergency management, anthropology, and sociology at the undergraduate level.

**Anthropology Major**

The Department of Sociology, Anthropology, and Emergency Management offers a major and minor in Anthropology. Anthropology is the study of humanity in all of its breadth and depth. It sets itself apart from other social sciences in its aspiration to understand all aspects of humankind. As a discipline, anthropology studies and celebrates human diversity. At the same time, it reminds us that despite our different cultures we are all members of the human family. We share a common nature and a common destiny.

In the anthropology program, students have the opportunity to explore the four branches of anthropology. At NDSU, the focal area has been North America and Oceania, although other areas of the world are in the curriculum. The Native American specialization reflects the department’s interest in the study of the history of the American Indians and the Native American culture. At NDSU, the focal area has been North America and the Native American specialization reflects this interest.

Anthropology consists of four subdisciplines: culture or social anthropology, physical or biological anthropology, archaeology, and linguistics. Thus, anthropologists study past and present cultures, historical and structural aspects of languages, and the biological aspects of past and present human populations. The 31 credit requirements include ANTH 111, SOC 110, two of the following four courses: ANTH 204, 205, 206, 208; ANTH 480 or other theory-or-method-based course approved by the advisor; and ANTH 489 (offered spring semester only). In addition to the 16 core credits, majors must complete 15 elective credits in anthropology.

**Sample ’08-09 Curriculum Anthropology Major**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
</tr>
<tr>
<td>Communications (C):</td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A):</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
</tr>
<tr>
<td>Wellness (W):</td>
</tr>
<tr>
<td>Cultural Diversity (D):</td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
</tr>
<tr>
<td>Social Science Elective</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**Major/Related Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 480, Development of Anthropology or another Anth theory or method-based course</td>
</tr>
<tr>
<td>ANTH 489, Senior Capstone in Anthropology</td>
</tr>
<tr>
<td>ANTH Option Courses</td>
</tr>
<tr>
<td>ANTH Electives</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**Additional Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Electives (for degree completion)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**Curriculum Total (min.)**

122

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for ENGL 110 with a passing grade. 3) Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May not double count with select Humanities & Fine Arts, Social & Behavioral Sciences and/or Science & Tech courses.

4 Major Requirements include SOC 110 and ANTH 111.

**Sample ’08-09 Curriculum Anthropology Minor**

**Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
</tr>
<tr>
<td>ANTH Electives</td>
</tr>
<tr>
<td>ANTH Electives (300-400 level)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

1 Refer to department or curriculum guide for course options.

**Emergency Management Major**

The Department of Sociology, Anthropology, and Emergency Management offers a major and minor in Emergency Management at the undergraduate level. Emergency Management is a growing profession and discipline of study addressing all phases of disaster and risk management. The mission of the major is to create a cadre of graduates with extensive theoretical and applied knowledge in emergency management and disaster research. The program covers natural and technological disasters as well as issues of homeland security and homeland defense.

Numerous career opportunities are available to those graduating with an Emergency Management major. Positions are available at all levels of government including city, county, state, federal and the military. A wide variety of local, national, and international voluntary organizations routinely hire graduates educated in emergency management for humanitarian relief efforts and related activities. Finally, there is increasing need in the private, business sector for emergency management and crisis management to address business and operational continuity. There has been an upward trend in the consequences of natural and technological disasters in the last 30 years. As a result, emphasis is being placed on the vulnerability and risk reduction to natural disasters such as Hurricane Katrina and human made disasters such as that on September 11, 2001, providing excellent job prospects for graduates in this field.

All aspects of society can be impacted by disasters, so the Emergency Management major is built on a core of sociology/anthropology courses: ANTH 111, SOC 110, 340, 341, and 422. Related to this sociology core, the major requires STAT 330 as a prerequisite or co-requisite for SOC 340, but STAT 330 does not count toward the 50 credits in the major. Additionally, the major includes two broad, introductory courses, EMGT 101 and SOC 620, a community development course, SOC 405, a special analysis (GIS) course, EMGT 414, plus four disaster phase courses: preparedness (EMGT 261), mitigation (EMGT 262), response (EMGT 263), and recovery (EMGT 264). The major requires EMGT 101 as a prerequisite for the four disaster phases. To complete the major, students should take six credits of electives and three credits of practicum (EMGT 496) and one credit capstone course (EMGT 489) in emergency management. The elective credits should be selected from undergraduate emergency management courses and/or emergency management related courses in other disciplines. Students are also encouraged to pursue internship opportunities in emergency management. Internship credits can be applied toward the required six credits of electives.

**Sample ’08-09 Curriculum Emergency Management Major**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
</tr>
<tr>
<td>Communications (C):</td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A):</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
</tr>
<tr>
<td>Wellness (W):</td>
</tr>
<tr>
<td>Cultural Diversity (D):</td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
</tr>
<tr>
<td>Social Science Elective</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
**Curriculum Total (min) ................. 122**

**Free Electives (for degree completion) ........... 29**

**Total ............................................ 50**

**1 Refer to department or curriculum guide for course options.**

**Sample '08-09 Curriculum**

**Emergency Management Minor**

The Emergency Management minor provides a multi-

disciplinary background in all phases of disaster and risk

management to natural and human made disasters.

**Requirements Credits**

EMGT 101 (201), Emer, Disasters, Catastrophes ........ 3
SOC 420, Sociology of Disaster ...................... 3
EMGT 261, Disaster Preparedness ....................... 3
EMGT 262, Disaster Mitigation ............................ 3
EMGT 263, Disaster Response ............................ 3
EMGT 264, Disaster Recovery ......................... 3

**Curriculum Total ............... 18**

**Sociology Major**

Sociology is the study of social structure, social inequal-

ity, social change and social interaction that comprise

societies.

The curriculum is structured to introduce majors to the

sociology discipline and provide them with concep-

tual and practical tools for understanding social behavior 

and societies. Areas of study include small groups, popula-

tions, inequality, diversity, gender, social change, families, 

community development, organizations, medical sociol-

ogy, and aging.

The 38-credit requirement includes the following core: 

ANTH 111, SOC 110, 340, 341, 422, and 489. (Note: 

An introductory statistics course is a prerequisite for 

SOC 340.) In addition to the 17 core credits, majors must 

complete four gateway courses (SOC 115, 202, 214 and 

233). The remaining 9 credits are electives in sociology.

**Curriculum Total ............... 18**

**Sample '08-09 Curriculum**

**Sociology Major**

**General Education Requirements Credits**

First Year Experience: (F) 

UNITV 189, Skills for Academic Success ........... 1

Communications (C) 

COMM 110, Fund of Public Speaking ................. 3

ENGL 110, 120, College Comp I, II .................. 3

ENGL Upper Level Writing(1) ...................... 3

Quantitative Reasoning (R): 

STAT 330, Intro Statistics ................................ 3

Science & Technology (S) ............................... 10

Humanities & Fine Arts (A): 

ANTH 111, Intro to Anthropology ..................... 3

SOC 110, Intro to Sociology ............................ 3

Social & Behavioral Sciences (B) ...................... 6

Wellness (W) ............................................. 2

Cultural Diversity (D) ..................................... 2

ANTH 111, Intro to Anthropology ..................... 3

Global Perspective (G) .................................... 6

**Total ............................................. 40**

**College/Department Requirements Credits**

Humanities Elective .................................... 3

Social Science Elective ................................. 3

Fine Arts Elective ...................................... 3

AHSS Elective (outside of major area) ................. 3

**Total ............................................. 12**

**Major/Related Requirements Credits**

SOC 115, Social Problems ................................ 3

SOC 202, Minorities & Race Relations ................. 3

SOC 214, Social Interaction ............................ 3

SOC 233, Sociology of Organizations & Work .......... 3

SOC 340, Soc Research Methods ....................... 3

SOC 341, Soc Research Methods Lab .................. 1

SOC 422, Development of Social Theory .............. 3

SOC 489, Capstone ..................................... 1

SOC Electives(3) ........................................ 9

**Total ............................................. 29**

**Additional Requirements Credits**

Free Electives (for degree completion) .............. 41

**Total ............................................. 41**

**Curriculum Total (min) ................. 122**

**Sample '08-09 Curriculum**

**Sociology Minor**

Because the study of sociology helps to understand and 

explain shared behavior of people in organized groups, a 

minor is an asset to majors in many other fields.

**Requirements Credits**

ANTH 111, Intro to Anthropology ..................... 3

SOC 111, Intro to Sociology ............................ 3

SOC Electives(3) ........................................ 6

SOC Electives (300-400 level)(3) ...................... 6

**Curriculum Total ............... 18**

**Community Development Minor**

The Community Development minor is an applied, 

multidisciplinary program consisting of 18 credits that 

includes coursework and an experiential component. 

Requirements include SOC 405; a three-credit internship; and 
a minimum of three credits in each of the following areas:

economics, business, and social science. Contact the 
department for the approved courses in each area.

**General Information**

The department offers a wide range of part-time and 

full-time internships. Placements may include fieldwork 
in business, community agencies, health care, and aging 

throughout the region. Upon approval of the student's 

application to the department and the sponsoring agency, 

students are placed in an environment in which both 

the applied and intellectual aspects of the professional 

experience are emphasized. The department also works 

with cooperative education and service learning activi-

ties to support experiential education. Interested students 

should contact the department chair.
The College of Business is committed to providing students with a quality education in the functional areas of business, a systematic exposure to the global business issues they will face in their careers, and an introduction to applying the technologies that will be a part of their work life. In addition, students may choose elective courses that will help prepare them for careers in specific areas in which they have an interest.

Undergraduate majors offered are: Accounting, Accountancy, Business Administration, Finance, Management, Management Information Systems, and Marketing. Academic minors are Accounting, Agribusiness, Management Information Systems, Business Administration, Fraud Investigation, Logistics Management, and Management Information Systems.

The College of Business is accredited by AACSB International – The Association to Advance Collegiate Schools of Business.

Admission Requirements

Students who wish to pursue a major in the College of Business at NDSU enroll as pre-professional students for their freshman and sophomore years. Pre-professional students apply for admission at least one semester prior to enrolling in the professional program. To be considered for admission, students must submit to the Dean’s Office a completed application, application fee, and current NDSU transcript.

Admission to the professional program requires successful completion of all pre-professional requirements, junior standing, and a minimum 2.5 institutional cumulative grade-point average. Students must be admitted into a professional program prior to enrolling in the advanced 300-400 level accounting, business administration, and/or management information systems courses.

The College of Business has specific policies on transfer course evaluations. The transfer of business courses into the professional program is limited to credit earned at AACSB accredited business programs. Contact the COB Student Service Center for more information.

Degree Programs

The College of Business offers undergraduate programs leading to the Bachelor of Science and Bachelor of Accountancy degrees. A Master of Business Administration is offered and is described in the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Degree Requirements

Students are required to complete the course requirements of one of the majors in the college. Requirements for graduation are those in existence at the time of admission to the professional program. In addition, all majors must maintain a 2.50 institutional cumulative grade-point average.

Students must be accepted into the professional program prior to the completion of the last 30 credits in required 300–400 level accounting, business administration, management information systems, and computer science courses. The last 30 credits must be completed in residence.

Course Requirements

Students must have junior standing (60 credits) and a minimum cumulative grade point average of 2.5 to enroll in 300-400 level courses in the College of Business. Students are required to earn a minimum grade of “B” in Accct 200: Elements of Accounting I, and Accct 201: Elements of Accounting II, or the equivalent courses in transfer, to enroll in 300-400 level accounting courses.

Cooperative Education

Cooperative Education, a program of the Career Center, offers undergraduate and graduate students an opportunity to integrate classroom study with paid, career-related work experience for academic credit. Work may be full or part time. Credit is granted through Continuing Education and awarded directly by the Cooperative Education program. A cooperative education experience may substantially improve students’ employment opportunities after graduation.

Department of Accounting and Information Systems

www.ndsu.edu/cob

Practicum Requirement

Majors in the Department of Accounting and Information Systems are required to complete a three-credit practicum experience while enrolled in the professional program. This requirement prepares the student for the accounting or management information systems world through practical experience in their primary area of study. Students must consult with their academic advisor and obtain approval prior to enrolling in the practicum. The following choices are available to meet the practicum requirement for Accounting or Accountancy majors: ACCT 397, Cooperative Education/Internship ACCT 413, Accounting Internship BUSN 415, Small Business Institute BUSN 486, Senior Thesis UNIV 492, Study Abroad IME 456, Program and Project Management

Note: Only ACCT 397 and ACCT 413 will count toward the accounting credit hours required for the Certified Public Accounting (CPA) exam.

Accounting Major

Accounting is a profession that deals with providing financial information used in making business decisions. Financial accountants prepare financial statements used in investing and lending decisions. Auditors examine financial statements and attest to their status. Management accountants evaluate and communicate internal financial information used by managers to operate a business. Forensic accountants specialize in the investigation and detection of, and protection against, fraud and abuse. Accountants also provide tax advisory services to firms, clients, and governmental agencies. With their specialized knowledge concerning the internal operation of a business, many accountants provide management advisory services. Also, because of the specialized knowledge, many accountants advance into management positions.

Students majoring in Accounting are required to learn how to use computers in business and must take courses in many other aspects of business to understand how an accountant’s work relates to marketing, management, finance, and production.

This four-year program leads to a Bachelor of Science degree with a major in Accounting. Completion of this program qualifies students to take the examinations required to become a Certified Management Accountant (CMA), and Certified Internal Auditor (CIA), and Certified Fraud Examiner (CFE).
Accountancy Major

Accountancy involves a range of skills that includes collecting, measuring, interpreting, analyzing, and communicating financial activity. A major in Accountancy focuses on the development of such skills along with an understanding of the legal, social, and ethical responsibilities involved in the accounting profession.

This five-year program leading to a Bachelor of Accountancy degree is specifically designed to prepare students for a career in public accounting. This program fulfills the requirement in North Dakota and other states for the Certified Public Accountant (CPA) examination.

Sample '08-09 Curriculum Accounting/Accountancy Majors

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): BUSN 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 320, Bus &amp; Professional Writing</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R): STAT 330, Intro to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S): ECON 201, Prin of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Including: CSCI 116, Bus Use of Computers</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A): PSYC 111, Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B): MATH 146, Applied Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>--</td>
</tr>
</tbody>
</table>

| Total | 53 |

Pre-Professional Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200, Elem of Accounting I</td>
</tr>
<tr>
<td>ACCT 201, Elem of Accounting II</td>
</tr>
<tr>
<td>MATH 146, Applied Calculus I</td>
</tr>
<tr>
<td>PSYC 111, Intro to Psychology</td>
</tr>
<tr>
<td>PHIL/RELS 210, Ethics or PHIL 216, Business Ethics</td>
</tr>
<tr>
<td>STAT 331, Regression Analysis</td>
</tr>
</tbody>
</table>

| Total | 18 |

Professional Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN 340, Prin of Finance</td>
</tr>
<tr>
<td>BUSN 350, Found of Management</td>
</tr>
<tr>
<td>BUSN 360, Found of Marketing</td>
</tr>
<tr>
<td>BUSN 430, Legal/Social Envir of Busn</td>
</tr>
<tr>
<td>BUSN 489, Strategic Mgmt</td>
</tr>
<tr>
<td>MIS 370, Mgmt Info Systems</td>
</tr>
<tr>
<td>ACCT 311, Intermediate Acc I, II</td>
</tr>
<tr>
<td>ACCT 320, Cost Management Systems</td>
</tr>
<tr>
<td>ACCT 420, Acc Info Systems</td>
</tr>
<tr>
<td>ACCT 421, Auditing I</td>
</tr>
<tr>
<td>ACCT Practicum</td>
</tr>
</tbody>
</table>

| Total | 39 |

Additional Requirements (Accounting)

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 318, Taxation in Mgmt Decisions</td>
</tr>
<tr>
<td>ACCT 418, Tax Accounting I</td>
</tr>
<tr>
<td>ACCT 300-400 Level Elective</td>
</tr>
<tr>
<td>BUSN/ECON 300-400 Level Electives</td>
</tr>
<tr>
<td>Free Electives (min)</td>
</tr>
</tbody>
</table>

| Total | 25 |

Additional Requirements (Accountancy) Credits

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN 352, Operations Mgt</td>
</tr>
<tr>
<td>BUSN 431, Business Law I</td>
</tr>
<tr>
<td>ECON 324, Money &amp; Banking</td>
</tr>
<tr>
<td>ACCT 321, Gov/Not-for-Profit Acct</td>
</tr>
<tr>
<td>ACCT 415, Advanced Accounting</td>
</tr>
<tr>
<td>ACCT 418, Tax Accounting I</td>
</tr>
<tr>
<td>ACCT 419, Tax Accounting II</td>
</tr>
<tr>
<td>ACCT 422, Auditing II</td>
</tr>
<tr>
<td>COMM Elective</td>
</tr>
<tr>
<td>ACCT Elective</td>
</tr>
<tr>
<td>BUSN 300-400 Level Electives</td>
</tr>
<tr>
<td>Free Electives (min)</td>
</tr>
</tbody>
</table>

| Total | 53 |

Management Information Systems Major

Management Information Systems concerns the collection, organization, analysis, and dissemination of information for the planning and control of business/organizational operations. The Management Information Systems (MIS) program is designed for students who wish to prepare for professional careers in information processing or information systems in business and government. The program is designed to develop technical skills and administrative insights required for design, development, implementation, maintenance, and management of organizational information systems.

The MIS program at NDSU is a collaborative effort by the faculty of two disciplines: Management Information Systems and Computer Science. The objective is to provide students with both theoretical knowledge and hands-on experience. In addition to the required courses in management information systems and computer science, majors must complete a practicum in the management information systems area. Students pursuing an MIS major typically earn a Computer Science minor.

The Bachelor of Science (B.S.) degree provides sufficient background and skills to support a successful career in technical computing (e.g., programmer, systems analyst, or systems designer), systems or network administration, database administration, information technology management, sales, or technical sales support.

Sample '08-09 Curriculum Management Information Systems Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): BUSN 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 320, Bus &amp; Professional Writing</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R): STAT 330, Intro to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S): ECON 201, Prin of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Including: CSCI 116, Bus Use of Computers</td>
<td>10</td>
</tr>
</tbody>
</table>

| Total | 40 |

Pre-Professional Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200, Elem of Accounting I</td>
</tr>
<tr>
<td>ACCT 201, Elem of Accounting II</td>
</tr>
<tr>
<td>CSCI 227, Computing Fundamentals I</td>
</tr>
<tr>
<td>CSCI 228, Computing Fundamentals II</td>
</tr>
<tr>
<td>MATH 146, Applied Calculus I</td>
</tr>
<tr>
<td>PSYC 111, Intro to Psychology</td>
</tr>
<tr>
<td>PHIL/RELS 210, Ethics or PHIL 216, Business Ethics</td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
</tr>
<tr>
<td>STAT 331, Regression Analysis</td>
</tr>
<tr>
<td>Electives (min)</td>
</tr>
</tbody>
</table>

| Total | 32 |

Professional Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN 340, Prin of Finance</td>
</tr>
<tr>
<td>BUSN 350, Found of Management</td>
</tr>
<tr>
<td>BUSN 352, Operations Mgmt</td>
</tr>
<tr>
<td>BUSN 360, Found of Marketing</td>
</tr>
<tr>
<td>BUSN 430, Legal/Social Envir of Busn</td>
</tr>
<tr>
<td>BUSN 489, Strategic Mgmt</td>
</tr>
<tr>
<td>MIS 370, Mgmt Info Systems</td>
</tr>
<tr>
<td>MIS 375, Database Design for Busn Appl</td>
</tr>
<tr>
<td>MIS 376, Data &amp; Telecom Admin</td>
</tr>
<tr>
<td>MIS 470, Adv Mgmt Info Systems</td>
</tr>
<tr>
<td>CSCI 315, System Analysis &amp; Design</td>
</tr>
<tr>
<td>CSCI 316, System Testing &amp; Maintenance</td>
</tr>
<tr>
<td>CSCI 372, Comparative Program Languages</td>
</tr>
<tr>
<td>CSCI 489, Social Implications of Computers</td>
</tr>
<tr>
<td>Programming Language Elective</td>
</tr>
<tr>
<td>Technology Elective I</td>
</tr>
<tr>
<td>Technology Elective II</td>
</tr>
<tr>
<td>BUSN Elective</td>
</tr>
<tr>
<td>MIS Practicum</td>
</tr>
</tbody>
</table>

| Total | 58 |

Curriculum Total

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Degree requirements are subject to change.</td>
</tr>
<tr>
<td>Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.</td>
</tr>
<tr>
<td>May double count with Select Humanities &amp; Fine Arts, Social &amp; Behavioral Sciences and/or Science &amp; Tech Gen Ed Courses.</td>
</tr>
</tbody>
</table>

| Total | 130 |
Management Information Systems Minor
The Management Information Systems minor is intended for students who are planning careers that involve more active roles as computer users and evaluators, designers, and/or builders of information systems. The minor will provide exposure to topics relevant to the management of information technologies and the means to achieve organizational goals.

Contact the Department of Accounting and Information Systems for specific course and minimum grade point average requirements. A minor approval form and fee are required.

Department of Management, Marketing, and Finance
www.ndsu.edu/cob
The major programs in the College of Business are designed to introduce students to all the functional areas of business, such as accounting, finance, management, and marketing. The Business Administration major allows students to achieve a broad base of knowledge in business, while majors in Finance, Management, and Marketing provide greater depth of knowledge in their respective areas.

The general education component of all of the major programs has been designed to develop basic skills, such as oral and written communication, as well as an understanding of people, culture, and natural phenomena. A thorough background in mathematics, statistics, computer science, and economics provides the student with the theory and analytical tools required for leadership in the modern business world.

To meet the changing needs in today's global environment, the College of Business emphasizes international coverage. International courses in finance, marketing, management, and business enable students to develop skills in understanding the global dimensions of decision-making. Students who wish to pursue international careers should consider a second major in International Studies or develop conversational skills in one or more foreign languages.

Students completing a Bachelor of Science degree in the College of Business find positions in banks, insurance companies, retail business, manufacturing, government service, and some manage their own business.

Sample ’08-09 Curriculum
Business Administration Major

<table>
<thead>
<tr>
<th>Pre-Professional Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200, Elem of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 201, Elem of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146, Applied Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>PHL 216, Business Ethics or</td>
<td></td>
</tr>
<tr>
<td>PHIL/RELS 210, Ethics</td>
<td></td>
</tr>
<tr>
<td>PSYC 111, Intro to Psychology</td>
<td></td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
<td></td>
</tr>
<tr>
<td>STAT 331, Regression Analysis</td>
<td></td>
</tr>
<tr>
<td>Free Electives (min)</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN 340, Prin of Finance</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 350, Found of Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 351, Found of Org Behavior</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 352, Operations Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 360, Found of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 430, Legal/Social Envir of Busn</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 451, Managerial Economics</td>
<td>4</td>
</tr>
<tr>
<td>BUSN 485, Strategic Mgmt</td>
<td>4</td>
</tr>
<tr>
<td>MIS 370, Mgmt Info Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECON 324, Money &amp; Banking</td>
<td>3</td>
</tr>
<tr>
<td>Finance 300-400 Level Elective</td>
<td>3</td>
</tr>
<tr>
<td>Management 300-400 Level Elective</td>
<td>3</td>
</tr>
<tr>
<td>Marketing 300-400 Level Elective</td>
<td>3</td>
</tr>
<tr>
<td>Environment of Busn 300-400 Level Elective</td>
<td>3</td>
</tr>
<tr>
<td>Additional 300-400 Level BUSN Elect (min)</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>55</strong></td>
</tr>
</tbody>
</table>

**Curriculum Total**                    **126**

1 Degree requirements are subject to change.
2 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received).
3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed Courses.
4 Refer to department or curriculum guide for course options.
5 3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed Courses.
6 Additional 300-400 Level BUSN Elect (min) is available in the COB Student Service Center.

Students may choose one of the following concentrations in finance, marketing, or human resource management. List of required courses for a concentration is available in the COB Student Service Center.

Sample ’08-09 Curriculum
Finance Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>BUSN 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL 320, Busn &amp; Professional Writing</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>STAT 330, Intro to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Including: CSCI 116, Busn Use of Computers</td>
<td>6</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td>6</td>
</tr>
<tr>
<td>ECON 201, Prin of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202, Prin of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-Professional Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200, Elem of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 201, Elem of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146, Applied Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>PHL 216, Business Ethics or</td>
<td></td>
</tr>
<tr>
<td>PHIL/RELS 210, Ethics</td>
<td></td>
</tr>
<tr>
<td>PSYC 111, Intro to Psychology</td>
<td></td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
<td></td>
</tr>
<tr>
<td>STAT 331, Regression Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Free Electives (min)</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>
College of Business

Professional Requirements  Credits
BUSN 340, Prin of Finance .......................... 3
BUSN 350, Found of Management .................. 3
BUSN 351, Found of Org Behavior .................. 3
BUSN 352, Operations Management .................. 3
BUSN 360, Found of Marketing .......................... 3
BUSN 430, Legal/Social Envir of Busn .................. 3
BUSN 460, Consumer Behavior .......................... 3
BUSN 463, Marketing Research .......................... 3
BUSN 465, Marketing Strategy .......................... 3
BUSN 489, Strategic Mgmt. .......................... 4
MIS 370, Mgmt Info Systems .......................... 3
300-400 Level BUSN Electives .......................... 9
300-400 Level Management Electives .......................... 9
Additional 300-400 Level Electives .......................... 9
Total ........................................ 55

Curriculum Total .................................. 126
1  Degree requirements are subject to change.
2  Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 with a C or higher will receive credit for English 110.
3  May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech GenEd Courses.
4  Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum
Marketing Major

General Education Requirements  Credits
First Year Experience [F]: BUSN 189, Skills for Academic Success .......................... 1
Communications [C]: COMM 110, Fund of Public Speaking .......................... 3
ENGL 110a, 120, College Comp I, II .......................... 3,3
ENGL 320, Busn & Professional Writing .......................... 3
Quantitative Reasoning [Q]: STAT 330, Intro to Statistics .......................... 3
Science & Technology [S]: .......................... 10
Including: CSCI 116, Busn Use of Computers
Social & Behavioral Sciences [B]:
ECON 201, Prin of Microeconomics .......................... 3
ECON 202, Prin of Macroeconomics .......................... 3
Wellness [W]: .......................... 2
Cultural Diversity [D] .......................... 1
Global Perspective [G]: .......................... 1
ECON 201, Prin of Microeconomics .......................... 3
Total ........................................ 40

Pre-Professional Requirements  Credits
ACCT 200, Elem of Accounting I .......................... 3
ACCT 201, Elem of Accounting II .......................... 3
MATH 146, Applied Calculus I .......................... 4
PHIL 216, Business Ethics or
PHIL/RELS 210, Ethics .......................... 3
PSYC 111, Intro to Psychology .......................... 3
SOC 110, Intro to Sociology .......................... 3
STAT 331, Regression Analysis .......................... 2
Free Electives (min) .......................... 10
Total ........................................ 31

Professional Requirements  Credits
BUSN 340, Prin of Finance .......................... 3
BUSN 350, Found of Management .................. 3
BUSN 351, Found of Org Behavior .................. 3
BUSN 352, Operations Management .................. 3
BUSN 360, Found of Marketing .......................... 3
BUSN 430, Legal/Social Envir of Busn .................. 3
BUSN 460, Consumer Behavior .......................... 3
BUSN 463, Marketing Research .......................... 3
BUSN 465, Marketing Strategy .......................... 3
BUSN 489, Strategic Mgmt. .......................... 4
MIS 370, Mgmt Info Systems .......................... 3
300-400 Level BUSN Electives .......................... 9
300-400 Level Marketing Electives .......................... 9
Additional 300-400 Level Electives .......................... 9
Total ........................................ 55

Curriculum Total .................................. 126
1  Degree requirements are subject to change.
2  Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120. Students with a composite ACT score of less than 21 are required to register for English 110.
3  May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech GenEd Courses.
4  Refer to department or curriculum guide for course options.

Business Administration Minor
Majors outside the College of Business often select a minor in Business Administration. A minor in Business Administration requires a minimum of 24 credits. At least 12 credits in 300-400 level business administration courses must be completed at NDSU in the College of Business. Prior departmental approval is required for any 300-400 level course not completed at NDSU but used to satisfy the minor requirements.

Students must earn a 2.50 grade point average that is based on the courses used for the Business Administration minor. A minor approval form and an application fee are required. This minor is not available to students with majors in the College of Business.

Practicum/Internships
Students are encouraged to complete a practicum experience while enrolled in the professional program. The practicum prepares students for challenges of the business world through practical experience in their primary area of study. Students must consult with their academic advisor and obtain approval prior to enrolling in the practicum.

Certiﬁcate Programs
Certificate programs in Finance, Human Resource Management, and Marketing provide an opportunity for individuals to enhance their knowledge base and become more productive in their professional careers. The programs focus on key concepts and tools that are consistent with current practice.

Prospective students are subject to the university’s admission policies and procedures. Contact the COB Student Service Center for program requirements and policies.

Graduate Program
The Master of Business Administration (MBA) is available. For more complete details, see The Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin

Agribusiness (Corporate Track) Minor
The 21-credit Agribusiness minor with a corporate track is an alternate track to the Agribusiness minor in the Department of Agribusiness and Applied Economics. The minor supplements a student’s technical training in agricultural sciences with an understanding of fundamental business concepts and applies business strategies to corporate agriculture decision-making. The Agribusiness minor with a corporate track is restricted to students with a major in the College of Agriculture, Food Systems, and Natural Resources, excluding agricultural economics and agribusiness majors.

This minor includes ACCT 102, ECON 201, BUSN 340, 350, and 360 plus three credits at the 300-400 level in AGEC and three credits at the 300-400 level in BUSN. See the Agriculture, Food Systems, and Natural Resource section for further information.

Logistics/Management Minor
The College of Business participates in the inter-disciplinary minor in Logistics. Companies and the public increasingly rely on an effective and efficient logistics system to remain competitive. See Interdisciplinary Programs section for further information.
The vision for the College of Engineering and Architecture is to provide leadership in education and research in the fields of engineering and architecture and to achieve a national reputation in selected areas. The college also will enhance the economy, environment, and society of the region through the development, communication, and application of knowledge in engineering and architecture.

Mission
The mission of the College of Engineering and Architecture is to provide outstanding education, research, and service to students, alumni, state residents, research partners, businesses, organizations, and government. Further, college faculty will provide leadership in economic development by transferring technology and by providing information and innovative design. College goals:

- Deliver quality undergraduate and graduate education by creating and utilizing effective instruction and by demonstrating commitment to each student's development.
- Encourage continuous learning among faculty, students, alumni, and the public.
- Develop distance education and continuing education for professionals seeking to upgrade skills.
- Provide laboratories and studios to facilitate quality education, research, and creativity.
- Foster research with an emphasis on engineering applications and creative design that most directly serves the region and influences the global community.
- Pursue niches of research opportunity and develop an industry/college learning center.
- Serve citizens, businesses, and industry in the region by providing professional expertise, outreach, and partnerships.

The departments include Agricultural and Biosystems Engineering, Architecture and Landscape Architecture, Civil Engineering, Construction Management and Engineering, Electrical and Computer Engineering, Industrial and Manufacturing Engineering, and Mechanical Engineering.

Accreditation
The facilities and curricula of the college are reviewed periodically by the Accreditation Board for Engineering and Technology, the National Architectural Accrediting Board, the American Council for Construction Education, and the Landscape Architecture Accreditation Board. These organizations are recognized national accrediting agencies for the engineering, architecture, landscape architecture, and construction management curricula.

Admission Requirements
Applicants for admission must satisfy the general admission requirements of the university and the special requirements of the college and department.

Recommended Preparation
Engineering programs encourage high school preparation in addition to the minimum core curriculum requirements. Prospective majors in engineering should present four units of high school mathematics including two units of algebra, one unit of geometry, and one-half unit of trigonometry. Science courses should include one unit of physics and one unit of chemistry. Students whose high school credentials or entrance examinations show deficiencies in these subjects will be required to enroll in courses designed to remove such deficiencies and cannot expect to complete a program of study in the number of semesters indicated in the printed curricula.

Selective Admission
Several programs within the College of Engineering and Architecture have selective admission. Refer to the department program descriptions below for respective selective admission criteria. Applicants should obtain information regarding the method of application from the NDSU Office of Admission.

Degree Programs
Undergraduate programs of study lead to the Bachelor of Science degree in the specific fields of agricultural and biosystems engineering, civil engineering, computer engineering, construction engineering, construction management, electrical engineering, environmental design, industrial engineering and management, manufacturing engineering, and mechanical engineering. A five-year professional degree completes the programs in architecture and landscape architecture. Each of the curricula includes a number of options for specialized study.

The college has developed its programs of study to provide an educational experience in keeping with the professions of architecture, landscape architecture, and engineering. The classrooms, studios, and laboratories are well equipped and every effort is made to keep them abreast of current technology. Graduates successfully apply for registration as professional engineers or architects after minimum periods of professional experience. Examinations of the North Dakota State Board of Registration for Engineers and Architects are given near campus each year. In addition, the Level I - Associate Constructor Certification Exam for American Institute of Constructors Certification Commission is offered each semester. All seniors are encouraged to take the examinations as soon as they are eligible.

All engineering departments have programs that lead to Master of Science and Doctor of Philosophy degrees. The Architecture department has a Master of Architecture degree. The graduate degrees are administered by the Graduate School and the College of Engineering and Architecture. A number of graduate assistantships are available to students undertaking graduate study. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Degree Requirements
To earn a baccalaureate degree from any of the engineering programs or the Construction Management program, a student must complete at least 60 semester credits of professional-level course work in his/her program while in residence and enrolled in the college. Students transferring into the college from programs with professional accreditation are exempt from the residence requirement, but are subject to NDSU’s residence policy. Other exemptions must be approved by the college.
Special Opportunities and Services

The college serves both students and the public. Special opportunities include the following:

- **General Program**
  
  [www.ndsu.edu/ndsu/academic/factsheets/eng_arch](http://www.ndsu.edu/ndsu/academic/factsheets/eng_arch)
  
  The General program of the College of Engineering and Architecture is designed to allow students, who have not chosen the branch of engineering they wish to study, to take basic courses for one year. Students are encouraged to select an engineering curriculum as soon as possible, but no later than the end of their first year.

- **Interdisciplinary Program**
  
  [www.ag.ndsu.nodak.edu/arm](http://www.ag.ndsu.nodak.edu/arm)
  
  This multidisciplinary program is available through the College of Agriculture, Food Systems, and Natural Resources, the College of Engineering and Architecture, and the College of Science and Mathematics. Refer to the Interdisciplinary Programs section of this Bulletin for further information.

Student Societies and Organizations

All students are eligible to join one or more of these organizations which are actively supported for the benefit of students in the related curricula: American Indian Science and Engineering Society, American Institute of Architecture Students, American Society of Agricultural Engineers, American Society of Civil Engineers, American Society of Landscape Architects, American Society of Mechanical Engineers, American Water Works Association, Water Environmental Federation (AWWA/WEF) (one group), Associated General Contractors, Engineers Without Borders, Institute of Electrical and Electronic Engineers, Institute of Industrial Engineers, Institute of Transportation Engineers, Materials Research Society (MRS), National Association of Home Builders, National Society of Black Engineers (NSBE), Society for the Advancement of Material and Process Engineering (SAMPE), Society of Automotive Engineers, Society of Manufacturing Engineers, Society of Plastics Engineers, Inc. (SPE), Society of Women Engineers, and the Surface Mount Technology Association.

The Air Force ROTC sponsors the Bernard S. Bennison Squadron of the Arnold Air Society (AAS). This is a non-profit student service organization dedicated to furthering the purpose, traditions and concepts of the United States Air Force. These objectives are primarily met through community service projects.

The Student Engineering and Architecture Council plans and administers many extracurricular student activities and is composed of elected representatives from the student societies.

Several national professional honor societies have chapters on the campus for which students with high academic attainments are eligible in their junior or senior years. Eligible students are selected for Tau Beta Pi from all engineering curricula, Tau Sigma Delta from architecture, Alpha Epsilon from agricultural and biosystems engineering, Eta Kappa Nu from electrical engineering, Alpha Pi Mu from industrial engineering, Sigma Lambda Alpha from landscape architecture, Sigma Lambda Chi from construction management and engineering, and Pi Tau Sigma from mechanical engineering. Membership in these societies is a coveted honor and highly regarded in the engineering and architectural professions.

The Engineering and Architecture Experiment Station and Extension Service

Research and development projects are administered by an executive staff responsible for general policies, publications, and cooperative relations with private and governmental agencies.

Executive Staff

Director, Gary R. Smith, PE
Agricultural and Biosystems Engineering,
Leslie Backer
Architecture, Paul H. Gleye
Civil Engineering, Dinesh Katti, PE
Electrical and Computer Engineering,
Daniel Evert
Industrial and Manufacturing Engineering,
Kambiz Farahmand
Mechanical Engineering, Alan Kallmeyer
Special research activities and projects of the college are coordinated through the Experiment Station. The professional services of faculty and the facilities of the college are available to both private and governmental agencies for research and development studies on engineering or architectural problems. Research projects of individual faculty members are sponsored and promoted by the station.

The Engineering Extension Service provides special educational project services to adults groups in conferences, workshops, short courses, and publications. The laboratory facilities of the college are available for special instruction under the supervision of faculty. Organizations planning educational programs or special projects for their members are invited to consult the service for assistance.

Cooperative Education

Cooperative Education, a program of the Career Center, offers undergraduate and graduate students an opportunity to integrate classroom study with paid, career-related work experience for academic credit. Work may be full or part time. Credit is granted through Continuing Education and awarded directly by the Cooperative Education program. A Cooperative Education experience may substantially improve students’ employment opportunities after graduation.

Department of Aerospace Studies

Aerospace Studies (Air Force ROTC)

[www.ndsu.edu/afrotc](http://www.ndsu.edu/afrotc)

The Air Force Reserve Officer’s Training Corps (AFROTCC) program is conducted by the Department of Aerospace Studies. The purpose of this program is to enable qualified undergraduate and graduate students to become commissioned officers in the United States Air Force.

AFROTCC learning experiences will be of long-range value whether one pursues a military or civilian career. Upon graduation and completion of the AFROTCC curriculum, each student is commissioned a second lieutenant in the United States Air Force.

The initial assignment options available to the Air Force second lieutenant include the following:

1. Enter the Air Force and complete the designated technical training course prerequisite to the student’s specialty, i.e., flight training, research and development, management, or support functions.
2. Apply for a delay in entering active duty for the purpose of pursuing an advanced degree.
3. Enroll in one or several Air Force sponsored graduate study programs while serving with full pay as an Air Force officer.

The Aerospace Studies curriculum is divided into two courses of instruction: the General Military Course (GMC), which parallels the freshman and sophomore academic years, and the Professional Officer Course (POC), which parallels the junior and senior academic years. Students in the four-year program normally attend four weeks of field training at a designated Air Force base during the summer between their sophomore and junior years. The student who chooses not to enroll in the GMC (first two years) may still earn a commission by enrolling in a special two-year program during the junior and senior years. Admission to this special program requires the student to make application early in the sophomore year. Qualified students will then participate in a six-week field-training program at an Air Force base the summer prior to their junior or senior year.

AFROTCC college scholarships are awarded to the best-qualified students and range in length from one to four years. These grants cover the cadet’s tuition, incidental lab fees and most textbooks. In addition, cadets receive a tiered monthly allowance. For example, cadets enrolled in the Professional Officer Corps (POC) receive $450 per month during their junior academic year and $500 per month during their senior academic year. Incentive scholarships also are available for students not already on scholarship.

Upon entering the Air Force, students who are selected to the pilot program will receive 48 weeks of pilot training.

Sample ’08-09 Curriculum

**Aerospace Studies Minor**

Satisfactory completion of the four-year AFROTCC program, 24 credits, constitutes a minor in Aerospace Studies.

For detailed information on the Air Force ROTC program, contact the Department of Aerospace Studies at 231-7371, 101 Benton/Bunker Fieldhouse or visit the Web site.

**General Military Course Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 110, Air Force Fitness (optional)</td>
<td>1</td>
</tr>
<tr>
<td>AS 111, Air Force Today I</td>
<td>1</td>
</tr>
<tr>
<td>AS 112, Air Force Today II</td>
<td>1</td>
</tr>
<tr>
<td>AS 210, Leadership Lab (1 credit each sem)</td>
<td>4</td>
</tr>
<tr>
<td>AS 211, Air and Space Power I</td>
<td>1</td>
</tr>
<tr>
<td>AS 212, Air and Space Power II</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8</td>
</tr>
</tbody>
</table>

**Professional Military Course Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 110, Air Force Fitness (optional)</td>
<td>1</td>
</tr>
<tr>
<td>AS 321, AF Leadership Mgmt I</td>
<td>3</td>
</tr>
<tr>
<td>AS 322, AF Leadership Mgmt II</td>
<td>3</td>
</tr>
<tr>
<td>AS 410, Leadership Lab (1 credit each sem)</td>
<td>4</td>
</tr>
<tr>
<td>AS 441, Prep for Active Duty I</td>
<td>3</td>
</tr>
<tr>
<td>AS 442, Prep for Active Duty II</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
</tr>
</tbody>
</table>
Agricultural and Biosystems Engineering

www.ageng.ndsu.nodak.edu

Agricultural and Biosystems Engineering Major

The Agricultural and Biosystems Engineering (ABEN) program prepares men and women for careers requiring application of physical, biological, and engineering sciences to problems relating to the production, handling, and processing of biological materials for food, feed, fiber, and fuel, the preservation of natural resources and environmental quality, and the design and production of machine systems. A major in Agricultural and Biosystems Engineering can serve a broad range of career interests and can provide excellent career opportunities for men and women from diverse backgrounds. The program objectives of this major are to educate graduates who will: (1) have the ability to use their technical knowledge, design and problem solving skills throughout their careers, (2) have interpersonal and collaborative skills and the capacity for productive careers, and (3) can use their disciplinary knowledge and educational depth and breadth to deal with changing career opportunities in agricultural and closely related industries. These objectives support the departmental mission of developing and extending knowledge through engineering and technology that advances the productivity of agricultural production, the processing and utilization of agricultural commodities and related biological materials, and the sustainment of environmental resources management.

Agricultural and biosystems engineering integrates engineering topics, engineering design, and biological sciences in a single program with two concentrations: agricultural engineering and biosystems engineering. While there is considerable overlap between the agricultural engineering (AGEN) and the biosystems engineering (BSEN) concentrations, requirements for the BSEN concentration include a heavier emphasis on fundamental biological and chemical sciences. The AGEN concentration includes a heavier emphasis in the engineering sciences. A wide range of electives in related disciplines can be used to complement the disciplinary course work and to prepare for specific career interests. Although not required by the curriculum, students are encouraged to take advantage of Cooperative Education experiences (paid internships) where they gain hands-on experience in engineering.

Biosystems Engineering Concentration

Graduates in biosystems engineering integrate engineering, biology, and chemistry in a variety of applications. Graduates may work in careers with the following goals: develop innovative green products and industries; convert bio-based resources to food, fuel, and other renewable products; design new generations of devices or systems for biological systems; and control biological systems for natural resource protection, waste remediation, and ecosystem restoration. Graduates may work with industries to create new and improved processes through the innovative use of microorganisms, plant and animal cells, and enzymes or they may develop sensors, control systems and computer models to monitor and control biological processes occurring in industry or the environment. Graduates with a biosystems engineering concentration may also pursue a professional or graduate degree in engineering, medicine, veterinary medicine, management, or law.

Agricultural Engineering Concentration

Career opportunities for graduates in agricultural engineering are many and diverse. Graduates may work for companies and agencies that design, develop, test, and manufacture power and machine systems; handle, store, process, and enhance or protect the quality of agricultural commodities and processed products; design environmental control and housing systems for plant and animal production; design equipment and systems for processing, manufacturing, distribution and quality protection of food products; manage air, land and water resources; design and manage crop irrigation systems; and develop electrical and electronic applications for agricultural problems. Graduates with an agricultural engineering concentration may also pursue graduate degrees in engineering, business, or law. By selecting appropriate elective courses, students may emphasize areas such as agricultural systems, environmental systems, biomaterials and processing systems, or an emphasis area designed by the student in consultation with an advisor.

Agricultural Systems Emphasis: This emphasis is focused on courses in machinery, power, structural, electronic and sensor systems to prepare students for positions related to engineering for improved food, feed, and fiber production.

Biomaterials Emphasis: With this emphasis, students prepare for engineering positions in the rapidly expanding industries that handle and process biomaterials for food and non-food products and that create new applications of sciences in biotechnical, biosource, and biorenewable fields.

Environmental Systems Emphasis: This emphasis is focused on the preparation of students for careers in environmental engineering, natural resources management, irrigation engineering, watershed management, and waste management.

Electives: Elective opportunities also are available in information and electronic systems and computer aided design. Students select elective courses with the individualized assistance of faculty advisors. The facility assist with career planning and job placement of graduates. Students interested in careers involving delivery, management, and technical support of systems for food, agricultural, or closely related industries rather than engineering or design should consider the Agricultural Systems Management major offered by the College of Agriculture, Food Systems, and Natural Resources.

Sample '08-09 Curriculum

Ag & Biosystems Engineering Major

General Education Requirements Credits
First Year Experience (F):
ABEN 189, Skills for Academic Success 1
Communications (C):
COMM 110, Fund of Public Speaking 3
ENGL 1101, 120, College Comp I, II 3
ENGL Upper Level Writing Course3 3
Quantitative Reasoning (R):
MATH 165, Calculus I 4
Science & Technology (S):
CHEM 121, General Chemistry I, II 3
PHYS 252, 252L, Univ Physics II, Lab 4
Humanities & Fine Arts (A) 6
Social & Behavioral Sciences (B) 6
Wellness (W) 2
Cultural Diversity (D) 3
Global Perspective (G) 3
Total 42

Major Requirements Credits
ABEN 110, Intro to Ag & Biosys Engr 2
ABEN 255, Crop & Soils Analysis & Design 3
ABEN 263, Biomaterials Processing 3
ABEN 482, Instrument & Measurements 3
ABEN 486, 487, Design Project I, II 2, 2
ABEN 496, Ag Technology Expo 1
ABEN 491, Seminar 1
CE 309, Fluid Mechanics 3
ENGR 402, Engr Ethics/Social Resp 1
IME 440, Engineering Economy 2
IME 460, Eval of Engr Data or STAT 330, Intro to Statistics 3
MATH 128, Intro to Linear Algebra 1
MATH 166, Calculus II 4
MATH 259, Multivariate Calc 4
MATH 266, Differential Equations 3
ME 221, Engineering Mechanics I 3
ME 222, Engineering Mechanics II 3
ME 350, Thermodynamics 3
Total 46

Concentration 1: Agricultural Engineering Credits
ME 212, Fund of Visual Communications 3
ME 223, Mech of Materials 3
CE 310, Fluid Mechanics Lab 1
ABEN 377, Modeling in ABEN 3
ECE 301, Electrical Engineering 1
ABEN Electives 9
CHEM/BIO Electives 3
Computer Electives 3
BUSN or COMM Electives 3
TECH Electives 8
Total 45

Concentration 2: Biosystems Engineering Credits
CHEM 121L, General Chemistry I Lab 1
CHEM 122L, General Chemistry II Lab 1
BIOL 150, General Biology I 3
BIOL 250, General Biology II 3
ABEN 444, Transport Processes 3
ABEN Electives 9
Computer Electives 3
CHEM/BIO Electives 6
ENGR Electives 9
TECH Electives 7
Total 45

Curriculum Total 133

1 Effective fall 2007, students with composite ACT score of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade. IP: Students with a composite ACT score of less than 21 are required to register for English 110.
2 Refer to department or curriculum guide for course options.
3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech Gen Ed courses.

Technical Electives: Students consult their advisor for approved courses according to their career interests and/or a selected emphasis area.

Agricultural Systems: Engineering for advancing productivity of food, feed, and fiber production; emphases may include power and machinery systems, machine design, manufacturing, structures and environment control, computer aided design, electrical and electronic systems, and instrumentation and measurements.
Biomaterials Systems: Engineering for quality maintenance, new uses, or enhanced utilization of agricultural and related biological materials; emphases may include engineering properties of biological materials, biological materials processing, food process engineering, and waste management.

Environmental Systems: Engineering for responsible use and sustainable management of environmental resources; emphases may include hydrology, soil and water resource conservation, irrigation engineering, water and wastewater engineering, water quality management, and hydrology.

Department of Architecture and Landscape Architecture
http://ala.ndsu.edu

Architecture Major
The architect must combine an understanding of society, artistic skill, and technological knowledge to shape places and spaces that enrich human life. Not only do the physical requirements need to be satisfied, but also there must be beauty to engage the human spirit. All of this requires a creative thought process that can balance and organize needs that are quite varied in nature. Clear, responsible, sensitive, and comprehensive thinking is demanded of the architect who is to integrate a wide range of factors into a design that is meaningful. For this reason an architect's education must range from the practical aspects of building construction to the study of environmental, social, and aesthetic issues.

Central to the study of architecture is the sequence of architectural studio courses. Students are assigned architectural problems, which may be hypothetical, realistic, or theoretical, and find their own solutions to them with frequent individual consultations with instructors. As the student progresses, the projects become larger and more complex or the solution becomes more detailed. In this way, knowledge and experience acquired in other classes are brought to bear on the principal responsibility of the architect and the architecture student, that of shaping separate considerations into a single design.

Selective Admission
Admission into the first-year Pre-Architecture Program is open to any student enrolled at NDSU. Transfer students are evaluated on the basis of courses taken and grades received. Upon completion of the first year, a selected number of students are admitted to the second year of the program on the basis of institutional GPA attained and performance in first-year architecture courses.

The Program
At the end of the third year, students may apply to the Master of Architecture degree program. The Bachelor of Science in Environmental Design is granted after the fourth year of study, and the professional Master of Architecture degree at the end of the fifth year of study. The program is fully accredited by the National Architectural Accrediting Board, and the M.Arch. degree is recognized by the National Council of Architectural Registration Boards as a professional degree.

The total number of credits required for the professional degree is 170, and the bachelor degree requirement is 134.

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted a 6-year, 3-year, or 2-year term of accreditation, depending on the extent of its conformance with established educational standards.

Master's degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree that, when earned sequentially, constitute an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

Special Notice
Students who are admitted into the second year of the program will be required to purchase a laptop computer. Information on type of computer, software, purchase, and financing arrangements will be distributed to admitted students prior to purchase.

Sample '08-'09 Curriculum

B.S. in Environmental Design/Master of Architecture Majors

General Education Requirements

Credits
First Year Experience (F):
- UNIV 189, Skills for Academic Success 1
Communications (C):
- COMM 110, Fund of Public Speaking 3
- ENGL 1101, 120, College Comp I, II 3,3
- ENGL 357, Visual Culture & Language 3
Quantitative Reasoning (R) 3
Science & Technology (S) 10
Including: PHYS 120, Fundamentals of Physics
Humanities & Fine Arts (A):
- ENVD 172, Environmental Design Fund 4
- ARCH 371, 372, Arch Design I, II 6,6
- ARCH 344, Arch Structures I 3
- ARCH 351, Materials & Const 4
- ARCH 354, Arch Detailing 3
- ARCH 371, 372, Arch Design III, IV 6,6
- ARCH 443, Arch Structures II 3
- ARCH 453, Environ Control Sys: Passive 3
- ARCH 454, Environ Control Sys: Active 3
- ARCH 461, Urban Design 2
- ARCH 471, 472, Arch Design V, VI 6,6
- LA 341, Site Dev & Detailing I 4
- MATH 105, Trigonometry 3
- SOC 110, Intro to Sociology 3
- Additional Humanities Electives 3

Total 92

Major/Related Requirements

Credits
- ENVD 130, Drawing/Environmental Design 3
- ENVD 172, Environmental Design Fund 4
- ARCH 231, Arch Drawing 3
- ARCH 232, Design Technology 2
- ARCH 271, 272, Arch Design I, II 6,6
- ARCH 322, History of Arch II 3
- ARCH 326, Design Theory 3
- ARCH 344, Arch Structures I 3
- ARCH 351, Materials & Const 4
- ARCH 354, Arch Detailing 3
- ARCH 371, 372, Arch Design III, IV 6,6
- ARCH 443, Arch Structures II 3
- ARCH 453, Environ Control Sys: Passive 3
- ARCH 454, Environ Control Sys: Active 3
- ARCH 461, Urban Design 2
- ARCH 471, 472, Arch Design V, VI 6,6
- LA 341, Site Dev & Detailing I 4
- MATH 105, Trigonometry 3
- SOC 110, Intro to Sociology 3
- Additional Humanities Electives 3

Total 92

Additional Requirements

Credits
(Master of Arch. Degree Only)
- ARCH 663, Programming & Thesis Prep 3
- ARCH 681, Prof Practice 3
- ARCH History/Theory Seminar 4
- ARCH 771, Advanced Arch Designs 6
- ARCH 772, Design Thesis 8
- ARCH 789, Professional Topics In Arch 6
- Electives (Graduate or Undergraduate) 8

Total 38

Master of Architecture

Curriculum Total 170

B.S. in Environmental Design Major

Curriculum Total 132

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade. (P) Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guides for course options.

Landscape Architecture Major

The Landscape Architecture program is one of approximately 63 accredited programs in the United States. The curriculum is reviewed periodically by the nationally organized Landscape Architecture Accreditation Board and has been fully accredited since 1991.

Landscape architects provide a wide variety of professional services for individual clients, organizations, corporations, and government agencies. They are involved at every phase of the development of a site, from the initial discussion of ideas with the client through the supervision of construction for the project.

Master planning of parks, zoos, golf courses, playgrounds, and recreation areas are familiar projects for landscape architects. They may also design multifunctional areas for urban renewal projects, college campuses, industrial parks, new communities, natural areas, reclaimed lands, and wetlands.

Besides designing sites, landscape architects often select building locations, prepare cost estimates, initiate long-range planning studies, determine utility corridors, and prepare environmental impact statements for future construction. Whether specializing within a large firm of landscape architects or working in a small professional office, the landscape architect is often collaborating with other professionals, such as engineers, city planners, and architects.

Most landscape architects spend some of their time at the drawing board or computer. They also spend many hours in the field, investigating and analyzing potential project sites, developing field notes for design layouts, completing visual surveys, and supervising construction. It is at the computer and drawing board that projects are actually organized and shaped into a creative and imaginative solution. The work and responsibility of each landscape architect depends principally on individual interests and abilities. Opportunities may range from professional practice on a small scale to administration of governmental programs.

Those who plan careers in landscape architecture should be able to work independently, have a capacity for solving technical problems, be artistically inclined, and willing to learn computer use. They should be prepared to work in the competitive environment of the profession, where great value is placed on leadership and the ability to work effectively with others. The range of interests and knowledge required in the profession of landscape architecture is broad; therefore, the courses required of students include many fields of study options. A student may specialize by selecting one of the options provided: Land Reclamation/ Natural Resources Management, Landscape Construction...
and Technology, Rural Community Development, or Design and Communication. Students may also tailor their own option area with their academic advisor.

**Selective Admission**

Admission into the first-year Pre-Landscape Architecture program is open to any student enrolled at NDSU. Transfer students are evaluated on the basis of courses taken and grades received. Upon completion of the first year, a selected number of students are admitted to the second year of the program. The basis for selection is institutional GPA and performance in first-year landscape architecture courses.

**Special Notice**

Students in the second year of the program will be required to purchase a laptop computer. Information on type of computer, software, purchase, and financing arrangements will be distributed to students prior to purchase.

**Sample ’08-09 Curriculum**

**Landscape Architecture Major**

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL 357, Visual Culture &amp; Language</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R): MATH 104, Finite Math or Math 146, Applied Calc I</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Science &amp; Technology (S): CSCI 114, Microcomputer Packages</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 150, General Biology I</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 105, Physical Geology</td>
<td>3</td>
</tr>
<tr>
<td>Co-Requisite Lab</td>
<td>1</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A): ENV 101, Intro to Environmental Design</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 321, History of Arch I</td>
<td>3</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B): PSYC 111, Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVD 130, Draw for Environ Designers</td>
<td>3</td>
</tr>
<tr>
<td>ENVD 172, Environmental Design Fund</td>
<td>4</td>
</tr>
<tr>
<td>LA 132, Intro to Landscape Arch.</td>
<td>2</td>
</tr>
<tr>
<td>LA 231, Landscape Arch Graphics</td>
<td>1</td>
</tr>
<tr>
<td>LA 232, Design Technology</td>
<td>2</td>
</tr>
<tr>
<td>LA 271, 272, Landscape Arch I, II</td>
<td>4.4</td>
</tr>
<tr>
<td>LA 322, Hist of Landscape Arch</td>
<td>4</td>
</tr>
<tr>
<td>LA 341, 342, Site Dev &amp; Detailing I, II</td>
<td>4.3</td>
</tr>
<tr>
<td>LA 344, Site Dev &amp; Detailing Lab</td>
<td>2</td>
</tr>
<tr>
<td>LA 351, Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>LA 371, 372, Landscape Arch III, IV</td>
<td>4.4</td>
</tr>
<tr>
<td>LA 441, Site Dev &amp; Detailing III</td>
<td>3</td>
</tr>
<tr>
<td>LA 471, 472, Adv Landscape Arch I, II</td>
<td>6.6</td>
</tr>
<tr>
<td>LA 491, Seminar</td>
<td>3</td>
</tr>
<tr>
<td>LA 531, Adv Landscape Arch Planting Design</td>
<td>4</td>
</tr>
<tr>
<td>LA 552, Adv Landscape Planning</td>
<td>2</td>
</tr>
<tr>
<td>PLSC 355, Woody Plants</td>
<td>3</td>
</tr>
<tr>
<td>ELEC 356</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
</tr>
</tbody>
</table>

**Additional Requirements (B.S. Degree)**

| Program Area Courses | 12 |
| Electives | 6 |
| Total | 18 |

**Curriculum Total (B.S. Degree)**

| 160 |

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received); students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade. (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2. Refer to department or curriculum guide for course options.

**Department of Civil Engineering**

**www.ce.ndsu.nodak.edu**

**Civil Engineering Division**

The mission of the Department of Civil Engineering is to provide quality education to prepare nationally competitive undergraduate students for a successful career in civil engineering; to provide advanced skills and knowledge in state-of-the-art research and design in sub-areas of civil engineering for graduate students; and to provide service to the university, engineering profession, and the public.

The following program education objectives are developed with the goal of preparing students to enter a modern civil engineering workforce and to be successful in their career and profession. The educational objectives are consistent with the university, college and department missions as well. The objectives are:

1. To ensure that graduates will have a mastery of fundamental knowledge, problem solving skills, engineering experimental abilities, and design capabilities necessary for entering civil engineering career and/or graduate school.
2. To produce graduates that have the knowledge and skills necessary for identifying and assessing design alternatives and the related social, economic, environmental, and public safety impacts.
3. To produce graduates who have verbal and written communication skills necessary for successful professional practice.
4. To prepare graduates to function effectively on teams.
5. To prepare graduates to deal with ethical and professional issues, taking into account the broader societal implications of civil engineering.
6. To prepare graduates for professional licensure, leadership roles and life-long learning.

Civil engineering includes the planning, design, construction, maintenance, and operation of a range of physical infrastructure projects. Civil engineers are in demand wherever there are people. The major subdivisions of civil engineering are structural, geotechnical, environmental, sanitary, water resources, and transportation engineering.

Civil engineers are responsible for designing infrastructure projects such as bridges and large buildings, dams, and other river and harbor works, municipal water supply and sanitation facilities, streets, highways, and other transportation facilities. On many projects, civil engineers work in close cooperation with engineers and scientists from other fields.

The Civil Engineering program at NDSU is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

**Civil Engineering Major**

The Civil Engineering curriculum is designed to give students a thorough mathematical and scientific background in all of the subdivisions of the field. At the same time it provides students with an opportunity to place further emphasis on his/her chosen subdivision through technical electives.

Twelve credits of the curriculum are available for technical electives. Students are required to choose three technical electives from the five major areas, while at the same time satisfying the ABET design requirement. All Civil Engineering students must take a capstone design course, CE 489, which is designed to bring concepts learned in different courses to culminate in a major design experience.

Students interested in structural engineering may choose courses like finite element analysis, advanced reinforced concrete, advanced steel design, timber design, pre-stressed concrete, foundation engineering, and dynamics of structures.

Students interested in water resources, sanitary, or environmental engineering may choose courses like solid waste management, applied hydraulics and hydrology, ground water and seepage, water and wastewater laboratory practices, properties of open channels, hazardous waste management, water quality management, and sanitary engineering problems.

Students interested in transportation engineering may choose courses like transportation planning, airport planning and design, railway planning and design, geometric highway design, or traffic engineering and pavement design.

Students interested in geotechnical engineering may choose courses in foundation engineering, earth slopes, and geosynthetics.

The curriculum includes a core of social humanistic subjects to provide the student with a background essential to a proper understanding of the role of engineering in society.

Students in Civil Engineering are strongly encouraged to participate in the Cooperative Education program to enhance their classroom education with practical experience in engineering-related positions in industry.

Students transferring into Civil Engineering from other departments or institutions are encouraged to do so no later than the beginning of the junior year if they wish to complete the degree requirements within two academic years.

Graduate programs leading to Master of Science and Doctor of Philosophy degrees are available in specialized fields. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

**Civil Engineering Major**

All Civil Engineering students at NDSU are required to have a minimum cumulative grade-point average of 2.0 and to have received a grade of C or better in Math 165, 166, 128, 259, and 266, and ME 221, 222, and 223, before enrolling in any classes that utilize these courses as prerequisites.

**Sample ’08-09 Curriculum**

**Civil Engineering Major**

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): CE/UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL 321, Writing in the Tech Professions</td>
<td>3</td>
</tr>
</tbody>
</table>
Quantitative Reasoning (R):
MATH 165, Calculus I ......................... 4
Science & Technology (S):
CHEM 121, 121L, Gen Chemistry I, Lab .... 3.1
CHEM 122, 122L, Gen Chemistry II, Lab .... 3.1
GEOL 105, Physical Geology .................. 3
Humanities & Fine Arts (A) ...................... 6
Including: ENGR 311, History Tech in America 
Social & Behavioral Sciences (B) ............. 6
Including: ENGR 312, Impact of Tech on Society 
Wellness (W) ........................................ 2
Cultural Diversity (D) ............................. 2
Global Perspective (G) ........................... 2
GEOL 105, Physical Geology .................... 2

Total .............................................. 132

Note: Department permission required for graduate level courses. Credit may be earned only at the undergraduate level. Department permission also is required for some undergraduate courses. There are specific prerequisites and grade requirements to be allowed to take certain courses.

Department of Construction Management and Engineering
www.ndsu.edu/cme

The mission of the Department of Construction Management and Engineering at North Dakota State University is to provide quality programs for preparing nationally competitive undergraduate and graduate students for a successful career in construction. The programs are designed to provide education, research, and outreach opportunities that serve both the needs of students and those of the construction industry. The educational objectives of the programs are to provide students with:
(a) basic skills necessary to plan, organize, and control resources to manage the overall construction process, (b) technical knowledge, design, and problem solving skills for a career in construction, (c) knowledge and skills necessary to identify, define, and compare design alternatives, (d) necessary communication skills for successful practice of the construction profession, and (e) opportunities to learn the need for professionalism and life-long learning, and the need to understand the broader societal implications of construction projects.

The continued rapid growth of the construction industry demands new kinds of professionals, the construction engineer, and manager. These professional constructors will be required to integrate new and high-level technology into all aspects of the design and construction process. All the aspects that contribute to the finished construction project from the initial planning stage through the final project turnover require close and careful attention. An individual with management and technical ability to oversee an entire project is essential to the industry. To fill the need for qualified professionals, the following degrees are awarded: Bachelor of Science in Construction Management and Bachelor of Science in Construction Engineering.

The construction programs are very practical in nature and are designed to prepare the graduate for entry into the construction industry on a professional level. Construction graduates build homes, highways, bridges, power plants, dams, tunnels, skyscrapers, and many other facilities of benefit to society.

Construction Engineering Major

The Construction Engineering program is a blend of engineering, construction, and construction management courses. This program is designed for those who want to work in the construction industry and enjoy the status of a professional engineer. It is somewhat similar to the Construction Management program, but has more emphasis on engineering and technical courses. The Construction Engineering program is accredited by the Engineering and Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - Tel: (410) 347-7700.

Educational Objectives
1. To prepare students for entry in successful careers in construction engineering emphasizing a fundamental understanding of the practice of construction engineering and management principles. Students will gain the ability to define, prioritize, and solve a broad set of engineering problems in construction, learn the importance of engineering judgment, and gain knowledge of contemporary and global issues. Students will also learn the creative process of engineering design, experimentation, data analysis, and the fundamentals of leadership.
2. To prepare students for the practice of construction engineering design and management with an emphasis on multiple solutions, sustainable construction, design alternatives, and impacts using the skills, techniques, and tools of modern engineering practice to achieve safety, quality, scheduling, economic, environmental, political, and social project objectives.
3. To facilitate an understanding of the societal and economic impacts of construction engineering practice and the professional and ethical responsibilities of the construction engineer.
4. To provide learning opportunities which prepare the construction engineering and management graduate to function in team-oriented, multi-disciplinary, open-ended engineering activities.
5. To provide a broad curriculum giving students a solid background in the basic sciences and mathematics; the ability to communicate effectively; and understanding and an appreciation for the humanities, social sciences, and management sciences; and the ability to engage in life-long learning through self-study, and/or continuing education.

Sample ’08-09 Curriculum

Construction Engineering Major

General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGL 320, Business &amp; Prof Writing or ENGL 321, Writing in the Tech Prof</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>MATH 165, Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>CHEM 121, 121L, Gen Chemistry I, Lab</td>
<td>3.1</td>
</tr>
<tr>
<td>CHEM 122, Gen Chem II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 252, Univ Physics II</td>
<td>4</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Including: ECON 105, Elements of Econ or ECON 201, Prin of Microeconomics or ECON 202, Prin of Macroeconomics</td>
<td>3,3</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td>ECON 105, 201, or 202</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
</tr>
</tbody>
</table>

Major/Related Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 128, Intro to Linear Algebra</td>
<td>1</td>
</tr>
<tr>
<td>MATH 166, Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 259, Multivariate Calc</td>
<td>3</td>
</tr>
<tr>
<td>MATH 266, Intro Diff Equations</td>
<td>3</td>
</tr>
<tr>
<td>ME 221, Engineering Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>ME 222, Engr Mechanics II</td>
<td>3</td>
</tr>
<tr>
<td>ME 223, Mech of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME 350, Thermal &amp; Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 252, Univ Physics II</td>
<td>4</td>
</tr>
<tr>
<td>Technical Electives</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
</tr>
</tbody>
</table>

Curriculum Total .............................................. 132

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 110; unless transfer credit for ENGL 120 is received. Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.

3 Refer to department or curriculum guide for course options.
Sample '08-'09 Curriculum

Construction Management Major

General Education Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIV 189</td>
<td>Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 120</td>
<td>English 120</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 121</td>
<td>English 121</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 122</td>
<td>English 122</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 202</td>
<td>English 202</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 320</td>
<td>Writing in the Profess</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 321</td>
<td>Writing in the Tech Profess</td>
<td>3</td>
</tr>
<tr>
<td>ECON 189</td>
<td>Skills for Academic Success</td>
<td>1</td>
</tr>
</tbody>
</table>

Educational Objectives

1. To provide students with the knowledge and skills required to identify, define, and solve problems.
2. To provide students with the basic skills necessary to plan, organize and control project resources, evaluate the effectiveness of the plans, and materials in order to manage the overall construction process.
3. To provide students with the required communication skills to function effectively on multi-disciplinary teams and to understand and appreciate the contributions of other disciplines within the construction process.
4. To provide students with the necessary skills to function effectively on multi-disciplinary teams and to understand and appreciate the contributions of other disciplines within the construction process.
5. To provide students with professional opportunities and to pursue life-long learning and involvement in professional associations within the broader societal context of the construction profession.
6. To provide students with the exposure to ethical, societal and global issues related to decision making in the construction management profession.

Departmental objectives:

1. Prepare our students to become competent electrical and computer engineers.
2. Promote life-long learning practice through continuous curriculum review, research, design, and other scholarly activities.
3. Stimulate student and faculty professional development through publications, participation in professional meetings and societies, and research involvement.
4. Maintain and enhance a positive departmental environment conducive to teamwork, discovery, and professional development.
5. Promote public awareness, interest, and respect for science, engineering, and technology.
6. Provide specialized services to the region, industrial partners, and the professional community.

The intended student outcomes of this major are to provide students with: a) an ability to apply knowledge of mathematics, science, and engineering; b) an ability to design and conduct experiments, as well as to analyze and interpret data; c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability; d) an ability to function on multidisciplinary teams; e) an ability to identify, formulate, and solve engineering problems; f) an understanding of professional and ethical responsibility; g) an ability to communicate effectively; h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context; i) a recognition of the need for, and an ability to engage in life-long learning; j) a knowledge of contemporary issues; k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice; and l) ability to grow in the knowledge of and make professional contributions to at least one specific area of ECE.

Electrical and computer engineers create products and services for society out of materials that exist in nature by using principles of science and creativity. The profession is broad, encompassing products valued by society in many technical specialties from electric power and energy utilization to those for current and future information transmission. Career employment opportunities within the profession range over design, development, manufacturing, sales, management, teaching, and research for industry and government.
Selective Admission

Departmental admission requirements for freshmen are an ACT (or equivalent) math test score of 23, or a top 30 percent class standing with a math ACT of 20. Transfer students from US institutions must have a 2.5 GPA; transfer students from international institutions must have a 3.0 GPA.

Further, the department policy is that transfer credits with grades of D in mathematics, science, or engineering courses are not accepted for the Electrical and Computer Engineering curriculum.

An institutional GPA of 2.0 or above is required prior to registration in junior- and senior-level courses. Majors must have a grade of C or better in the following courses: all required mathematics courses through MATH 266; ECE 111, 173, 275, and EE 206.

The Programs

Major components of the undergraduate programs are basic science and mathematics, humanities and social sciences, communication, engineering science, engineering design and ethics, and both breadth and depth in electrical and computer engineering.

Graduate studies leading to Master of Science and Doctor of Philosophy degrees are offered in the department. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Computer Engineering Major

The Computer Engineering program provides a background in three broad areas: computer hardware, software, and hardware-software integration. Fundamental computer topics included in the program are microprocessors, embedded systems, computer architecture, digital systems, data communications and related computer material. In addition, the program includes core engineering subjects that are common to all engineering disciplines and basic university studies in humanities and social science. The Computer Engineering program at NDSU is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering & Technology (ABET).

Recommended ’08-09 Curriculum

Computer Engineering Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>MATH 165, Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>CHEM 121, General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 251, 252, Univ Physics I, II</td>
<td>4,4</td>
</tr>
<tr>
<td>Science Lab.</td>
<td>1</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>

Major Requirements

<table>
<thead>
<tr>
<th></th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 161, Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 222, Discrete Math</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 474, Operating Systems Concepts</td>
<td>3</td>
</tr>
<tr>
<td>ECE 111, Intro to ECE</td>
<td>3</td>
</tr>
<tr>
<td>ECE 173, Intro to Computing</td>
<td>3</td>
</tr>
<tr>
<td>ECE 275, Digital Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ECE 311, Circuit Analysis II/Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 321, Electronics I/Lab</td>
<td>5</td>
</tr>
<tr>
<td>ECE 343, Signals &amp; Systems</td>
<td>4</td>
</tr>
<tr>
<td>ECE 351, Applied EM/Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 341, Random Process</td>
<td>3</td>
</tr>
<tr>
<td>ECE 373, Assembly Programming</td>
<td>3</td>
</tr>
<tr>
<td>ECE 376, Embedded Systems, Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 401, Design I (capstone)</td>
<td>1</td>
</tr>
<tr>
<td>ECE 403, Design II (capstone)</td>
<td>2</td>
</tr>
<tr>
<td>ECE 443, Communications I, Lab</td>
<td>4</td>
</tr>
<tr>
<td>ECE 405, Design III (capstone)</td>
<td>3</td>
</tr>
<tr>
<td>EE 206, Circuit Analysis I</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 402, EngR Ethics/Social Resp</td>
<td>1</td>
</tr>
<tr>
<td>MATH 129, Basic Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>MATH 166, Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 265, Calculus III (w/Vectors)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 266, Intro Diff Equations</td>
<td>3</td>
</tr>
<tr>
<td>ME 211, Engineering Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>CPRE Core Electives*</td>
<td>9</td>
</tr>
<tr>
<td>ECE or ENGR Science Electives*</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>89</strong></td>
</tr>
</tbody>
</table>

**Curriculum Total**                          **132**
1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.
2 Refer to department or curriculum guide for course options.
3 May double count with select Humanities & Fine Arts, Social & Behavioral Sciences and/or Science & Tech Gen Ed courses.

Electrical Engineering Major

The Electrical Engineering program at NDSU is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

EE Specialization

The Electrical Engineering program is designed to reflect the broad nature of the field, and students may tailor their studies within broad parameters. Students are encouraged to develop an individual program of study in close consultation with their advisors. Examples are available to illustrate how specialization may be obtained in a number of different technical areas. Students may mix and match from the examples to suit their particular interests. Technical areas include the following:

**Biomedical Engineering:** This area is firmly based in engineering and the life sciences. The integration of medicine and engineering serves to provide appropriate products, tools, and techniques for research diagnosis and treatment by health care professionals. Some important products are artificial hearts, medical imaging (MRI, ultrasound, CT scans), prosthetic devices, and computer aids for diagnosis. Biomedical engineers help identify the problems and needs that can be solved using engineering technology and systems methodology to provide high-quality health care at reasonable cost.

**Communication and Signal Processing:** These are closely related fields within electrical engineering. Communication is the process of transferring information from one point in time and space to another point. Signal processing involves signal representation, as well as signal design and filtering. Students with this specialization find challenging opportunities worldwide to meet the need for more convenient, inexpensive, and reliable communication and signal processing.

**Computer Engineering:** This area involves hardware and software for small and large computers and for all the products that have dedicated computers within the product, such as microwave ovens and automobiles.

**Control Engineering:** This is the design and implementation of algorithms for controlling physical systems. Examples include active suspension for cars, auto pilots for aircraft, and robot motion control.

**Electromagnetics:** This area includes electromagnetic compatibility, fiber optics, antennas, microwave devices, radar, sonar, satellite systems, power and communication transmission lines, grounding, shielding, and propagation.

**Electronics and Microelectronics:** Examples are integrated circuits, VLSI, transistors, lasers, consumer electronics, defense electronics, power electronics, and electronic materials.

**Optical Engineering:** The Optical Engineering option was developed jointly with the Department of Physics. Many technical disciplines now use optics. Medicine uses laser surgery and optical diagnostics. Communications is expanding optical fiber communication. Image processing is using optical techniques. The Optical Engineering option prepares future engineers in such areas as quantum theory; coherent/incoherent, polarized/non-polarized light; geometric, physical and Fourier optics; holography; and image processing and acquisition.

**Power Systems:** This area includes the generation, transmission, distribution, and utilization of electric energy subject to safety, environmental, and economic concerns.

Recommended ’08-09 Curriculum

Electrical Engineering Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>MATH 165, Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>CHEM 121, General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 251, 252, Univ Physics I, II</td>
<td>4,4</td>
</tr>
<tr>
<td>Science Lab.</td>
<td>1</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>
Industrial Engineering and Architecture

In addition, both majors offer the student opportunities for specialization in the junior and senior years. IE&M students may apply their elective courses for extra study in production operations and management, healthcare management engineering, and reliability and quality management. MfgE students can elect additional specialization in electronics manufacturing and process engineering.

Both IE&M and MfgE students learn in an environment of professional realism. Many of the major courses fulfill their learning objectives through projects that are done with industrial companies. Students interact with practicing professionals to learn the real-world applications of the theories they master in the classrooms. There also are many laboratories where students gain hands-on understanding of machinery and engineering systems. Students in both IME majors are urged to take advantage of Cooperative Education and internship positions wherever possible. The knowledge gained through these experiences enhances career preparation and provides for expanded placement opportunity upon graduation.

Learning in the IME Department is a partnership of student and faculty. The student’s responsibility is to learn - to master the concepts, theories and practices that lead to career success. The faculty responsibility is four-fold: to provide an atmosphere that is conducive to learning; to assure availability of the tools necessary for effective and efficient learning; to offer guidance on educational and professional matters; and to evaluate student achievement. The usual faculty role is one of mentor, encouraging students to grow in stature as soon-to-be engineers and as practicing professionals.

IME graduates are prepared for careers that design, develop and implement devices, processes and systems that manufacture, construct, operate and service products, equipment and facilities that are often conceived in other engineering disciplines. Career positions in IE&M and MfgE form the vital linkages between abstract concepts and the reality of products and facilities of real use to customers. Graduates are in demand for employment in a very wide range of industries from production of all types of goods to transportation and distribution to information to healthcare to consulting.

In all cases, career positions for IME graduates involve design of processes and procedures in advanced technology environments. These professions routinely apply sophisticated modern tools in information handling, distributed communications, computer-driven controls, and a wide variety of technologically advanced equipment and apparatus. In addition, IME career professionals are skilled in the integration of people and technology within the business context of world-class enterprises. They make satisfying careers in organizations of all sizes and types, located in all parts of the world. Graduates generally have a wide choice in where they work and live, as well as the size and kind of company for which to work.

Post-graduate studies also are available in the IME department, leading to the Master of Science and Doctor of Philosophy degrees. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Industrial Engineering and Management Major

Industrial Engineering and Management is a good choice for people with the aptitude and interest for careers that blend technology and people. First, this is an engineering program, with the traditional content of mathematics, sciences, engineering analysis and design. Graduates are traditionally very successful in nationally-normed professional engineering examinations. Beyond the basics, this program also challenges students to integrate resources with technology. In addition to scientific principles and technological systems, IE&M students study people systems, cost analysis, facilities and other elements of the business enterprise. The "engineering" and "management" pieces are blended and integrated.

Just as the profession requires a blend of scientific, technological and humanistic skills, student learning in IE&M is an integrated process. The discipline-specific courses place the student in position to experience many elements of real situations in industry and commerce. Moreover, the program has been nationally cited for integrating design across all levels, with freshmen and juniors or sophomores and seniors often working together.

Graduates of the IE&M program will be able to:

1. Apply statistical, operations research and simulation tools to solve problems relevant to modern production, commercial, social and/or governmental organizations, with principal emphasis on quality, productivity, continuous improvement, and enterprise integration.
2. Design processes and systems to effectively and economically employ and integrate technology and people in organizational environments in industrial, healthcare, logistics, service and/or governmental settings, with appropriate consideration for environmental factors, health and safety, manufacturability and ethical, economic, social and political issues.
3. Employ in effective learning in topics and areas relevant to professional advancement and to enhancing the quality of personal life.
4. Participate effectively in multidisciplinary teams in both leadership and followership roles.
5. Effectively communicate complex technological concepts, issues and professional details to a variety of audiences.

IE&M graduates are in high demand across a wide spectrum of industries. In recent years, the most active employers have represented transportation, warehousing and distribution, healthcare, information systems, software, facilities development and consulting industries, as well as many of the production sectors that have been the traditional concentration for industrial engineers. IE&M graduates are sought after for responsible positions in project and organizational management, financial modeling, technological training, logistics, and design of processes, procedures, facilities, and systems.

Sample '08-'09 Curriculum

Industrial Engineering and Management Major

General Education Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1101, 120, College Comp I, II</td>
<td>3,3</td>
<td></td>
</tr>
<tr>
<td>CHEM 121, 121L, Gen Chemistry I, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>MATH 165, Calculus I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH 166, Calculus II</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 321, Writing in the Tech Profess</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 102, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 150, Introduction to Engineering</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 201, Engineering Analysis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 202, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 301, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 302, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 303, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 304, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 305, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 306, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 307, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 308, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 309, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 310, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 311, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 312, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 313, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 314, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 315, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 316, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 317, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 318, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 319, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 320, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 321, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 322, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 323, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 324, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 325, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 326, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 327, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 328, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 329, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 330, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 331, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 332, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 333, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 334, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 335, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 336, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 337, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 338, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 339, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 340, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 341, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 342, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 343, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 344, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 345, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 346, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 347, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 348, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 349, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 350, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 351, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 352, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 353, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 354, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 355, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 356, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 357, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 358, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 359, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 360, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 361, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 362, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 363, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 364, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 365, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 366, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 367, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 368, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 369, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 370, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 371, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 372, Engr Ethics/Social Resp</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGR 373, Engineering Design</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Major/Related Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 402, Engr Ethics &amp; Social Resp</td>
<td>1</td>
</tr>
<tr>
<td>IME 111, Intro to IME</td>
<td>3</td>
</tr>
<tr>
<td>IME 311, Work/Station Design</td>
<td>3</td>
</tr>
<tr>
<td>IME 330, Mfg Processes I</td>
<td>3</td>
</tr>
<tr>
<td>IME 440, Engineering Economy</td>
<td>3</td>
</tr>
<tr>
<td>IME 450, Systems Engineering Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>IME 456, Program &amp; Project Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>IME 460, Evaluation of Engineering Data</td>
<td>3</td>
</tr>
<tr>
<td>IME 461, Quality Assurance &amp; Control</td>
<td>3</td>
</tr>
<tr>
<td>IME 462, Total Quality in Industrial Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>IME 470, Operations Research I</td>
<td>3</td>
</tr>
<tr>
<td>IME 472, Simulation of Busn &amp; Industri al Sys</td>
<td>3</td>
</tr>
<tr>
<td>IME 480, Production &amp; Inventory Control</td>
<td>3</td>
</tr>
<tr>
<td>IME 482, Automated Manufacturing Systems</td>
<td>3</td>
</tr>
<tr>
<td>IME 485, Indust &amp; Mfg Facility Design</td>
<td>3</td>
</tr>
<tr>
<td>MATH 129, Basic Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>MATH 166, Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 259, Multivariate Calc</td>
<td>3</td>
</tr>
<tr>
<td>MATH 266, Intro Diff Equations</td>
<td>3</td>
</tr>
<tr>
<td>ME 212, Fund of Visual Communication</td>
<td>3</td>
</tr>
<tr>
<td>ME 221, Engineering Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>ME 222, Engr Mechanics II</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Science Electives</td>
<td>12</td>
</tr>
<tr>
<td>Technical Electives</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>88</strong></td>
</tr>
</tbody>
</table>

Curriculum Total ..................................... 131

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.
3. Refer to department or curriculum guide for course options.

**Industrial Engineering and Management Minor**

Students majoring in any engineering discipline may elect a minor in Industrial Engineering and Management. These optional studies offer engineering students the opportunity to add important career-enhancing skills to their technological competencies. The elected courses in an IE&M minor add skills for integrating technology and resources within the complex of people, technology, machinery and information that make up the successful modern business enterprise. Students completing this minor will achieve better understanding of organizational and management processes and will be better prepared to work in the multi-functional teams crucial to success in industry.

Minors at NDSU require a minimum of 16 credits. The foundation requirements for the IE&M minor are:
- IME 111, Introduction to IME
- IME 311, Work/Station Design

The remaining 10 credits may be selected from any IME 300- and 400-level courses for which prerequisites are in place. The only exception is Evaluation of Engineering Data (IME 460), which does not count toward this minor.

Interested students are encouraged to visit with relevant faculty in the IME Department for advice on course selection to best suit their career interests. Students must complete the graduation requirements for another engineering major before the designation of the IE&M minor will be placed on their transcripts.

**Industrial Engineering and Management Areas of Emphasis**

Students majoring in Industrial Engineering and Management may prepare for specific career choices by careful use of the technical electives included in the IE&M major. It is suggested that students confer with their academic advisor for assistance in choosing the most appropriate optional courses. Particular areas of emphasis may be selected in the following special interests:

- Healthcare management engineering
- Production operations and management
- Process and production engineering
- Reliability and quality management
- Lean manufacturing
- Specialized manufacturing processes (electronics, aircraft, plastics and composites)

These topical areas are also available for post-graduate study, leading to the Master of Science in Industrial Engineering and Management and the Doctor of Philosophy in Industrial and Manufacturing Engineering degrees. For complete details, see the Graduate Bulletin online at ndsu.edu/gradschool/bulletin.

**Sample ’08-09 Curriculum**

**Industrial Engineering and Management Minor**

**Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IME 110, Introduction to IME</td>
<td>3</td>
</tr>
<tr>
<td>IME 311, Work/Station Design</td>
<td>3</td>
</tr>
<tr>
<td>IME 300-400 level Courses</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

**Management Sequence for Non-Majors**

The practices and procedures learned in the Industrial Engineering and Management major are universally applied in public and private organizations of all kinds. IE&M courses are available as electives for students majoring in computer science, mathematics, sciences, business administration, cereal science, agricultural economics, and facility management. Courses recommended for non-majors are: Work/Station Design (IME 311), Engineering Economy (IME 440), Mgmt of People Systems (IME 455), Program & Project Mgmt (IME 456), and Evaluation of Engineering Data (IME 460).

**Manufacturing Engineering Major**

Manufacturing Engineering is a good choice for people who have both aptitude and interest in production of goods for improved living standard for the general populace. This career field is all about the production of goods - from automobiles and tractors and airplanes to electronic products, recreational products, sports equipment, books and toys - to foodstuffs. Manufacturing engineers are employed in every industry that produces goods of some kind.

Manufacturing engineers may focus on the interaction between work piece and tool as process scientists or process engineers. They may concentrate on integrating the many different processes and parts necessary to make up finished products - as production engineers. Or, as manufacturing systems engineers, they may take a very wide view of the manufacturing enterprise, including its supply chain, distribution channels, financial structure and resource management. In every particular focus, manufacturing engineers are the people who design the processes through which products are made with the required functionality, to high quality standards, in the quantities needed, available when and where customers prefer, and at the best possible price.

Every day, manufacturing engineers make decisions about technology, machinery, people, and money. The preparation for the excitement and challenge of modern manufacturing requires students to master the mathematics and applied science common to all engineering disciplines. They then will master the fundamentals of process engineering and production engineering so that they may apply these principles to production of any type of goods.

Graduates of the Manufacturing Engineering program will be able to:

1. Solve problems relevant to modern manufacturing industries, with principal emphasis on process engineering and production engineering, as well as selected aspects of process science and the manufacturing enterprise.
2. Design competitive manufacturing processes and production systems, integrating machinery, technology, people and money, with appropriate consideration for environmental factors, health and safety, sustainability and ethical, economic, social and political issues.
3. Engage in effective learning in topics and areas relevant to professional advancement and to enhancing the quality of personal life.
4. Participate effectively in multi-disciplinary teams in both leadership and follower roles.
5. Effectively communicate complex technological concepts, issues and professional details to a variety of audiences.

Manufacturing Engineering graduates are well positioned to select career employment in any manufacturing industry. Graduates are actively recruited by companies that produce agricultural and construction machinery and vehicles, complex industrial apparatus, recreational vehicles, airplanes, household goods, building products, and both industrial and consumer electronics. Manufacturing Engineering graduates generally begin their careers designing processes and production systems or directly managing some phase of manufacturing. Frequently, they progress to increased responsibilities, with broader scope and yet more opportunity.

**Sample ’08-09 Curriculum**

**Manufacturing Engineering Major**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME/UNIV 189, Skills for Acad Success</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>

1. First Year Experience (F): ME/UNIV 189, Skills for Academic Success
2. Communications (C):
   - COMM 110, Fund of Public Speaking
   - ENGL 110, 120, College Comp I, II
   - ENGL 321, Writing in the Technical Professions
3. Quantitative Reasoning (R):
   - MATH 165, Calculus
4. Science & Technology (S):
   - CHEM 121, 121L, Gen Chemistry I, Lab
   - CHEM 122, Gen Chemistry II
   - CHEM 240, Survey of Organic Chemistry
   - PHYS 252, 252L, Univ Physics II, Lab
   - Humanities & Fine Arts (A)
   - Social & Behavioral Sciences (B)
   - Wellness (W)
   - Cultural Diversity (D)
   - Global Perspective (G)

**Major/Related Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 402, Engr Ethics &amp; Social Resp</td>
<td>1</td>
</tr>
<tr>
<td>IME 111, Intro to IME</td>
<td>3</td>
</tr>
<tr>
<td>IME 311, Work/Station Design</td>
<td>3</td>
</tr>
<tr>
<td>IME 330, Mfg Processes I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total** ..................................... 43

---

**College of Engineering and Architecture**
IME 380, CSD/CAM for Manufacturing ..................................... 3
IME 430, Process Engineering ............................................... 3
IME 431, Production Engineering ........................................... 3
IME 432, Composite Materials Manufacturing ....................... 3
IME 440, Engineering Economy ............................................ 3
IME 456, Program & Project Mgmt ......................................... 3
IME 460, Evaluation of Engineering Data .................................. 3
IME 461, Quality Assurance & Control .................................... 3
IME 480, Production & Inventory Control ............................... 3
IME 482, Automated Manufacturing Systems ......................... 3
IME 489, Manufacturing Engr Capstone ................................ 3
MATH 128, Intro to Linear Algebra ....................................... 1
MATH 166, Calculus II .......................................................... 4
MATH 259, Multivariate Calc ............................................... 3
MATH 266, Intro Diff Equations ............................................ 3
ME 212, Fund of Visual Communication ............................... 3
ME 221, Engineering Mechanics I ......................................... 3
ME 222, Engr Mechanics II ................................................ 3
ME 223, Mech of Materials ................................................... 3
ME 331, Engr Materials I .................................................... 4
CSCI Elective ........................................................................... 3
Engineering Science Electives1 .............................................. 9
Technical Electives2 .............................................................. 6
Total .................................................................................. 88

Curriculum Total .............................................................. 131
1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.
2 May double count with select Humanities & Fine Arts, Social & Behavioral Science and or Science & Tech Gen Ed courses.
3 Refer to department or curriculum guide for course options.

Manufacturing Engineering Areas of Emphasis

Students majoring in Manufacturing Engineering may prepare for specific career choices by careful use of the two technical electives and the three Engineering Science requirements included in the Manufacturing Engineering major. It is suggested that students confer with their academic advisor for assistance in choosing the most appropriate optional courses. These topical areas also are available for post-graduate study, leading to Master of Science in Manufacturing Engineering and Doctor of Philosophy in Industrial and Manufacturing Engineering degrees. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Sample '08-09 Curriculum Manufacturing Engineering Minor

Requirements Credits
IME 330, Manufacturing Processes ........................................... 3
IME 380, CAD/CAM in Manufacturing .................................. 3
IME 430, Process Engineering ............................................... 3
IME 431, Production Engineering ........................................... 3
IME 300-400 Level Electives1 (min) ......................................... 4
Total ................................................................................ 16
1 Refer to department or curriculum guide for course options.

Manufacturing Sequences for Non-Majors

Most industrial enterprises engage in the production of some sort of goods in some way and to some degree. Students majoring in other disciplines can enhance their career value by expanding their knowledge of process engineering and production engineering.

For students majoring in other engineering disciplines or in the agricultural or physical sciences, the technological foundations of manufacturing can be acquired through Manufacturing Processes I (IME 330), Process Engineering (IME 430) and Production Engineering (IME 431). Also, engineering majors from other disciplines may elect to acquire more depth in electronics manufacturing (IME 427) and plastics and composite manufacturing (IME 432, 435).

Department of Mechanical Engineering and Applied Mechanics

www.ndsu.edu/me

Mechanical engineering is a broad field primarily concerned with the principles of motion, energy, and force. Mechanical engineers are called upon to design machinery, mechanisms, and systems that function safely, reliably, and efficiently to serve needs of society. To accomplish this, mechanical engineers apply scientific principles to problems that involve the motion of heat, gases, fluids, and solid materials.

Mechanical engineers may be found in nearly all segments of society. They work in industry, consulting practices, government facilities, and universities. In industry, mechanical engineers work for equipment manufacturers, utilities, material processing plants, environmental firms, and companies that deal with aerospace, transportation, petroleum, biomedical products, and others. Mechanical engineers employed by the government and universities contribute to the betterment of society by conducting research to solve present and future problems. As technology becomes more prevalent in daily life, mechanical engineers are increasingly called upon to apply that technology to develop devices that improve the standard of living.

Mechanical Engineering Major

The Mechanical Engineering program at NDSU is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). The curriculum is designed to produce baccalaureate-level graduates who are well prepared to accept engineering positions in industry and government or to pursue advanced degree studies.

The mission of the Mechanical Engineering Department is to educate undergraduate and graduate students in the fundamentals of the discipline, prepare graduates to effectively function in society in the field of their choice, and to provide the learning skills to adapt to evolving personal and professional goals. To accomplish this mission, the educational objectives of the program are to produce graduates who:

1. Are well educated in the fundamentals of the discipline, and possess the ability and willingness to adapt to emerging technologies through continued professional development.
2. Will contribute in a competent manner to the engineering profession in the field of their choice.
3. Demonstrate a commitment to uphold ethical and professional standards in the practice of engineering.
4. Can effectively function in a team environment and interact with people of diverse backgrounds.
5. Understand the context in which their designs will be implemented and the corresponding impact of their activities on society.

A complete listing of the program outcomes associated with these objectives can be viewed on the department’s web site.

Strong program emphasis is placed on engineering science, laboratory, and design. The use of modern computer tools and techniques in engineering practice also is incorporated throughout the curriculum. In addition, liberal arts education is included to prepare graduates for becoming concerned and productive members of society.

Students transferring into mechanical engineering from other departments or institutions are encouraged to do so no later than the beginning of the junior year if they wish to complete the degree requirements within two academic years.

Graduate programs leading to Master of Science and Doctor of Philosophy degrees in Mechanical Engineering are offered by the department. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Selective Admission

The Department of Mechanical Engineering has a selective admission policy. To be admitted to the basic program (freshman and sophomore level), freshman applicants must either rank in the top one-third of their high school graduating class or have received a score of 26 or higher in the math portion of the ACT. Transfer students, whether from another university or from another department at NDSU, must have an institutional grade point average (GPA) of at least 2.8.

To enter the professional program (junior and senior level), students must complete the basic program with an institutional GPA of 2.8, and a core course GPA of 2.8, with no grade below C in any one of the core courses.

A minimum institutional GPA of 2.5 is required for graduation from Mechanical Engineering. No course grades less than C are acceptable to fulfill a program requirement.

Curriculum Options

All Mechanical Engineering majors have a common curriculum during the first two years. At the beginning of the third year, students may choose one of the following curriculum options to complete their program of study:

Standard: Students who are interested in exploring a spectrum of technical electives may follow the Standard curriculum and choose a minimum of five technical elective courses. These courses cover a wide range of topics and students may tailor their choices to reflect their special interests in solid mechanics and design, thermal sciences, materials and nanotechnology, injection molding, biomechanical engineering, or other areas as added in the future. For a complete list of technical electives available in each area, students should consult with their advisor or the department.

Coatings and Polymeric Materials: The Coatings and Polymeric Materials option in Mechanical Engineering at NDSU is a unique program offered nowhere else in the United States. Upon completion of this option, students are eligible to receive a minor in Coatings and Polymeric Materials. This minor is for students wishing to prepare for a career as a mechanical engineer in the plastics and coatings industries, or for a career in a manufacturing industry as a mechanical engineer with expertise in the fields of plastics and coatings.

Numerous career opportunities for mechanical engineers with this specialized training are available in the coatings industry, which manufactures paints and coatings to enhance and preserve such items as automobiles, ships, steel structures, machines, and household appliances. Many other opportunities are available in various manufacturing industries where more and more components previously fabricated from metals are now made from plastics and fiber-reinforced composite materials. Due to the unique nature of this program, the demand for graduates far exceeds the supply.
Sample '08-'09 Curriculum
Mechanical Engineering Major

General Education Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td>1</td>
</tr>
<tr>
<td>ME/UNIV 189, Skills for Acad Success</td>
<td></td>
</tr>
</tbody>
</table>

Communications (C):

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 321, Writing in the Tech Profess</td>
<td>3</td>
</tr>
</tbody>
</table>

Quantitative Reasoning (R):

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 165, Calculus I</td>
<td>4</td>
</tr>
</tbody>
</table>

Science & Technology (S):

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121, 122, General Chemistry I, II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 252, 252L, Univ Physics II, Lab</td>
<td>4</td>
</tr>
</tbody>
</table>

Humanities & Fine Arts (A)                        | 6       |

Social & Behavioral Sciences (B)                   | 2       |

Wellness (W)                                      | 2       |

Cultural Diversity (D)                            | 2       |

Global Perspective (G)                            |         |

Total                                             | 42      |

Major Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 301, Electrical Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>ECE 303, Electrical Engr II</td>
<td>3</td>
</tr>
<tr>
<td>ECE 306, Electrical Engr I Lab</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 402, Engr Ethics &amp; Social Resp</td>
<td></td>
</tr>
<tr>
<td>IME 330, Mfg Processes I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 129, Basic Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>MATH 166, Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 259, Multivariate Calc</td>
<td>3</td>
</tr>
<tr>
<td>MATH 266, Intro Diff Equations</td>
<td>3</td>
</tr>
<tr>
<td>ME 212, Fund of Visual Communication</td>
<td></td>
</tr>
<tr>
<td>ME 213, Modeling of Engr Systems</td>
<td></td>
</tr>
<tr>
<td>ME 221, Engineering Mechanics I</td>
<td></td>
</tr>
<tr>
<td>ME 222, Engr Mechanics II</td>
<td></td>
</tr>
<tr>
<td>ME 223, Mech of Materials</td>
<td></td>
</tr>
<tr>
<td>ME 331, Engr Materials I</td>
<td></td>
</tr>
<tr>
<td>ME 351, Thermodynamics I</td>
<td></td>
</tr>
<tr>
<td>ME 352, Fluid Dynamics</td>
<td></td>
</tr>
<tr>
<td>ME 412, Engr Measurements</td>
<td></td>
</tr>
<tr>
<td>ME 423, Intern Mech of Materials</td>
<td></td>
</tr>
<tr>
<td>ME 421, Theory of Vibrations</td>
<td></td>
</tr>
<tr>
<td>ME 442, Machine Design I</td>
<td></td>
</tr>
<tr>
<td>ME 454, Heat &amp; Mass Transfer</td>
<td></td>
</tr>
<tr>
<td>ME 457, Thermal Systems Lab</td>
<td></td>
</tr>
<tr>
<td>ME 461, Design Project I</td>
<td></td>
</tr>
<tr>
<td>ME 462, Design Project II</td>
<td></td>
</tr>
</tbody>
</table>

Total                                             | 72      |

Additional Requirements (Standard ME Major)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Electives</td>
<td>15</td>
</tr>
</tbody>
</table>

Total                                             | 75      |

Additional Requirements (Coatings & Polymeric Materials Option)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 341, 341L, Org Chemistry I, Lab</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 342, Org Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CPM 451, Lab, Chem, Radiation, Biol Safety</td>
<td>1</td>
</tr>
<tr>
<td>CPM 474, 484, Coatings I, Lab</td>
<td>3,2</td>
</tr>
<tr>
<td>CPM 475, Coatings II</td>
<td></td>
</tr>
<tr>
<td>ME 473, Polymer Engineering</td>
<td></td>
</tr>
<tr>
<td>ME 453/474, Composite Materials Elective</td>
<td></td>
</tr>
</tbody>
</table>

Technical Electives                               | 6       |

Total                                             | 6       |

Curriculum Total (Standard ME Major)              | 129     |

Sample '08-'09 Curriculum
Military Science Minor

Requirements (Years 1-2)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 101, Foundations of Officercy</td>
<td>1</td>
</tr>
<tr>
<td>MS 102, Basic Leadership</td>
<td>1</td>
</tr>
<tr>
<td>MS 110, Army ROTC Fitness</td>
<td>2</td>
</tr>
<tr>
<td>MS 201, Indiv Leadership Studies</td>
<td>2</td>
</tr>
<tr>
<td>MS 202, Leadership &amp; Teamwork</td>
<td>2</td>
</tr>
</tbody>
</table>

Total                                             | 8       |

Requirements (Years 3-4)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 301, Leadership &amp; Prob Solving</td>
<td>3</td>
</tr>
<tr>
<td>MS 302, Leadership &amp; Ethics</td>
<td>3</td>
</tr>
<tr>
<td>MS 320, Leadership Lab</td>
<td>1</td>
</tr>
<tr>
<td>MS 401, Leadership &amp; Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>MS 402, Officership</td>
<td>3</td>
</tr>
<tr>
<td>MS 420, Leadership Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

Total                                             | 14      |

Military Science (Army ROTC)

www.ndsu.edu/armyrotc

The Army Reserve Officers Training Corps (Army ROTC) program is conducted by the Department of Military Science. Army ROTC gives students the opportunity to become involved in a unique program that adds the leadership component to their college education. It also provides several financial assistance options. Students, regardless of their majors, are eligible to participate in this program. The primary objective of the program is to provide the knowledge and skills required for men and women to serve as commissioned officers in the active Army, Army Reserve, or Army National Guard. NDSU’s Military Science Department is seeking students who have leadership potential, particularly those who are scholars, athletes, and leaders.

The Army ROTC program is a four-year program of instruction in the military sciences taken in conjunction with an academic program curriculum. Advanced placement credit may be received for previous or current military service. The program requires a minimum of 22 credit hours and leads to a minor in Military Science. The program is divided into two parts: the basic course and the advanced course.

The basic course is normally taken during the freshman and sophomore years. Students participating in the basic course incur no military obligation or commitment. Instruction offered in the basic course include: physical fitness class, military leadership and management, land navigation, U.S. military history, first aid, tactics, and drill and ceremonies. Military skills laboratories also are offered. These include adventure activities such as rappelling, rope bridging, tactics, military equipment use, drill and ceremony, survival techniques, and a leadership reaction course.

Students entering the advanced course must have a minimum of two years of academic work remaining in a curriculum leading to either a baccalaureate or graduate degree. Students may qualify for entry into the advanced course by one of the following: completing basic training, attending the five-week ROTC Leaders Training Course (LTC), or having prior military service in any of the armed forces of the United States. Members of the Army National Guard or Army Reserve may qualify for direct entry into the advanced course and can maintain membership in their Guard/Reserve Unit by enrolling for the Simultaneous Membership Program (SMP) option.

Scholarship cadets and advanced course students receive a monthly monetary tax-free allowance of $350 to $500 per month (tiered from freshman through senior year).

Advanced course students receive instruction in advanced leadership and management and are afforded the opportunity to apply their acquired knowledge to practical situations. Military skills laboratories also are offered. In addition to the listed military science curriculum, advanced course students must complete an approved course in written communication skills, military history, and computer literacy.

Students also attend the five-week Leader Development and Assessment Course (LDAC) at Fort Lewis, Wash., (near Tacoma) between the first and second year of the advanced course. The Leader Development and Assessment Course is designed to develop and evaluate a student’s judgment and decision-making abilities, build physical endurance and self-confidence, and allow a student to apply leadership skills. Leadership positions are rotated among the students so that each person experiences firsthand what it takes to apply leadership skills and develop an organization.

Four-, three-, and two-year Army ROTC scholarships are available, which provide for payment of tuition and fees. Students receive $600 per semester for books and equipment, and an allowance of $350 to $500 per month for each year the scholarship is in effect. Generally, four-year scholarships are awarded to high school students who wish to compete during their senior year for a scholarship, but college freshmen also have been awarded this highly desirable scholarship.

Students who do not qualify for the ROTC program or who do not wish to pursue an officers’ commission may audit courses in the advanced ROTC program, if approved by the professor of military science. Auditing students’ participation is limited to the classroom and they are not eligible for monetary allowances.

For detailed information on the Army ROTC program, contact the Department of Military Science, 1-800-798-7755 or 231-7755, Room 103 Benton/Bunker Fieldhouse or visit the department web site.

Sample '08-'09 Curriculum
Military Science Minor

Requirements (Years 1-2)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 101, Foundations of Officercy</td>
<td>1</td>
</tr>
<tr>
<td>MS 102, Basic Leadership</td>
<td>1</td>
</tr>
<tr>
<td>MS 110, Army ROTC Fitness</td>
<td>2</td>
</tr>
<tr>
<td>MS 201, Indiv Leadership Studies</td>
<td>2</td>
</tr>
<tr>
<td>MS 202, Leadership &amp; Teamwork</td>
<td>2</td>
</tr>
</tbody>
</table>

Total                                             | 8       |

Requirements (Years 3-4)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 301, Leadership &amp; Prob Solving</td>
<td>3</td>
</tr>
<tr>
<td>MS 302, Leadership &amp; Ethics</td>
<td>3</td>
</tr>
<tr>
<td>MS 320, Leadership Lab</td>
<td>1</td>
</tr>
<tr>
<td>MS 401, Leadership &amp; Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>MS 402, Officership</td>
<td>3</td>
</tr>
<tr>
<td>MS 420, Leadership Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

Total                                             | 14      |
The College of Human Development and Education

www.ndsu.edu/hde

Virginia Clark Johnson, Dean

The College of Human Development and Education was established in July 1992. There are five units in the college. Four of these – Apparel, Design, and Hospitality Management; Child Development and Family Science; Education; and Health, Nutrition, and Exercise Sciences – offer programs at the bachelor’s, master’s, specialist and doctoral levels. The fifth – Center for 4-H Youth Development – offers Extension youth programming across the state. Students are prepared for careers in education, colleges and universities, business and industry, community services, hospitals and health care facilities, and public and private programs concerned with design, human welfare, fitness, and recreation.

Mission

The mission of the College of Human Development and Education is to provide educational programs and conduct research and other scholarly activities that focus on the lives of individuals and their families as they interact in work, educational, and living environments. Opportunities are provided to broaden the student’s understanding and appreciation of the aesthetic, cultural, economic, physical, psychological, and social elements that influence individual and family well being. Programs are designed to help each student develop professional competencies, attain a liberal education, and relate the learnings from the basic disciplines to various applications.

Accreditation

The Center for Child Development is accredited by the National Association for the Education of Young Children. The Couple and Family Therapy program is accredited by the Commission on Accreditation for Marriage and Family Therapy Education. The Athletic Training program is certified by the Commission on Accreditation of Athletic Training Education. Education programs are accredited by the National Council for Accreditation of Teacher Education and approved by the North Dakota Education and Standards Practice Board.

The School Counseling and Community Counseling programs are accredited by the Council for the Accreditation of Counseling and Related Educational Programs. The Educational Leadership program is accredited by the Educational Leadership Constituency Council. The Dietetics program is accredited by the American Dietetic Association. The Interior Design program is accredited by the Council for Interior Design Accreditation.

The Exercise Science Program is endorsed by the American College of Sports Medicine and the Commission of Accreditation of Allied Health Education programs: Committee on Accreditation for Exercise Sciences. Family Financial Planning is approved by the Certified Financial Planner (CFP) Board of Standards. Hospitality and Tourism Management is accredited by the Accreditation Commission for Programs in Hospitality Administration.

Degree Programs

Undergraduate programs in the college lead to a Bachelor of Science or a Bachelor of Arts degree. Recommendation of candidates for teacher certification also rests within this college through the School of Education.

Graduate study leading to a Master of Science degree is offered in Child Development and Family Science, Counseling, Merchandising, Educational Leadership, Entry-Level Athletic Training, Sport and Recreation Studies, Exercise Science, Nutrition Science, Physical Education, Public Health, Sport Pedagogy, and Teacher Education. A Master of Education degree may be earned through Health, Nutrition and Exercise Sciences and the School of Education. Doctoral programs also are offered by the college in Human Development and in Education.

The College of HD&E offers six master’s programs or options online. Online programs make earning an advanced degree an option for anyone accepted into the college of Graduate and Interdisciplinary Studies. The programs are: Merchandising, Family Financial Planning, Gerontology, Youth Development, Family and Consumer Science Education, and Dietetics. For more information view the Graduate School Website at www.ndsu.edu/gradschool.

The Human Development (Ph.D.) program has an interdisciplinary approach, which allows students to focus on one of three tracks: Wellness, Counseling Education, or Applied Gerontology. The doctoral program in Education (Ph.D. or Ed.D.) is a cross-disciplinary emphasis, which allows students a choice between two tracks: Institutional Analysis and Occupational and Adult Education. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Degree Requirements

Students enrolled in major programs in the college are required to follow curriculum guidelines, available in the Academic Advising Office of the college (270 EML) or department offices, for each of the curriculum options and majors. Course requirements in each program fulfill university, college, and departmental requirements. Refer also to graduation requirements and related information listed earlier in the Academic Policies section.

All undergraduate degree candidates must apply for graduation through the Office of Registration and Records according to university procedures and deadlines.

Courses taken pass/fail will not be used to satisfy any requirements other than total credits. Departments may have additional restrictions. Approval must be obtained and processed during the first three weeks of the regular semester. Once processed, a course cannot be changed back to regular grading.

MATH 101 and 102 are developmental courses and will not count toward credits for graduation in any program.

General college requirements for undergraduate degrees extend beyond the minimum university general education requirements. An advisor should be consulted for specific courses. Students also are encouraged to follow their own interests in choosing electives that go beyond the minimum requirements. Minimum requirements for each degree include the following:
Bachelor of Science Degree

General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Education</td>
<td></td>
</tr>
<tr>
<td>Community Health Option</td>
<td></td>
</tr>
<tr>
<td>School Health Option</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td>Music (K-12)</td>
<td></td>
</tr>
<tr>
<td>Vocal</td>
<td></td>
</tr>
<tr>
<td>Instrumental</td>
<td></td>
</tr>
<tr>
<td>Physical Education (K-12)</td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td></td>
</tr>
<tr>
<td>Social Science</td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td></td>
</tr>
<tr>
<td>Elementary Education:</td>
<td></td>
</tr>
<tr>
<td>An Elementary Education program is available through the cooperation of Valley City State University, the degree-granting institution for this program. This degree program must be completed concurrently with a CDFS major from NDSU or another major upon approval. Upon completion of the Dual Degree Program, the graduate will have earned a Bachelor of Science degree from the College of Human Development and Education and a major in Child Development and Family Science from NDSU and a Bachelor of Science degree in Elementary Education from Valley City State University. The dual program is designed to be completed in four years.</td>
<td></td>
</tr>
<tr>
<td>Minors</td>
<td></td>
</tr>
<tr>
<td>A minor is a similar grouping of courses in which the university requires a minimum of 16 credits. (At least eight credits of the minor must be taken at NDSU.) Departments may require more credits for their minors. For the minors to be awarded, students must declare a minor and complete a minor verification form. Information on specific minors may be obtained in the college. Saturdays.</td>
<td></td>
</tr>
<tr>
<td>Interdisciplinary Programs</td>
<td></td>
</tr>
<tr>
<td>The College of Human Development and Education participates in two interdisciplinary programs on campus:</td>
<td></td>
</tr>
<tr>
<td>Gerontology Minor</td>
<td></td>
</tr>
<tr>
<td>The Gerontology minor provides students with an integrated understanding of the process of aging, aging services, and the aged in America. For further information, refer to the Interdisciplinary Programs section of this Bulletin.</td>
<td></td>
</tr>
<tr>
<td>Women's Studies Major and Minor</td>
<td></td>
</tr>
<tr>
<td>The goals of Women's Studies is to examine the contributions of women to all aspects of society, to explore the intersections of race, class, sexual orientation, age, and physical ability with gender both globally and nationally, to investigate the heritage, challenges and concerns of women, and to provide a newer and broader understanding of women in all fields. For further information, refer to the Interdisciplinary Programs section of this Bulletin.</td>
<td></td>
</tr>
</tbody>
</table>

Curriculum Majors and Options

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparel and Textiles</td>
<td></td>
</tr>
<tr>
<td>Apparel Studies Option</td>
<td></td>
</tr>
<tr>
<td>Retail Merchandising Option</td>
<td></td>
</tr>
<tr>
<td>Child Development and Family Science</td>
<td></td>
</tr>
<tr>
<td>Child Development Option</td>
<td></td>
</tr>
<tr>
<td>Family Science Option</td>
<td></td>
</tr>
<tr>
<td>Dietetics</td>
<td></td>
</tr>
<tr>
<td>Elementary Education/CDFS Dual</td>
<td></td>
</tr>
<tr>
<td>Exercise Science</td>
<td></td>
</tr>
<tr>
<td>Hospitality and Tourism Management</td>
<td></td>
</tr>
<tr>
<td>Interior Design</td>
<td></td>
</tr>
<tr>
<td>Sport and Recreation Studies</td>
<td></td>
</tr>
<tr>
<td>Recreation Management Option</td>
<td></td>
</tr>
<tr>
<td>Sport Management Option</td>
<td></td>
</tr>
</tbody>
</table>

Secondary Education:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Education</td>
<td></td>
</tr>
<tr>
<td>Biological Sciences</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
</tr>
<tr>
<td>Comprehensive Science Education</td>
<td></td>
</tr>
<tr>
<td>Earth Science</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
</tr>
<tr>
<td>Communications Option</td>
<td></td>
</tr>
<tr>
<td>Family and Consumer Sciences Education</td>
<td></td>
</tr>
<tr>
<td>French</td>
<td></td>
</tr>
</tbody>
</table>

Requirements also include a course in cultural diversity, a course in global perspectives, and integration of the following within existing courses: communication activities in upper-division major courses, comprehension of personal and professional ethics, and a capstone experience. These courses, professional courses for the major, and electives must total a minimum of 122 credits to meet degree requirements.

Bachelor of Arts Degree

In addition to all of the preceding requirements listed for the Bachelor of Science degree, Bachelor of Arts degree requirements include the following:

- Six (6) additional credits of humanities and social behavioral sciences
- Two years of one modern foreign language at the college level or equivalent
- Students with two units/years of a foreign language in high school should enter the second year college-level language course. Students with four or more units/years of a foreign language in high school or college will be considered to have completed the language requirement.

Cultural Diversity (D): 0

Global Perspective (G): 0

Total: 40

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 110 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C- or higher will receive credit for English 110 with an equivalency. (P) Students with a composite ACT score of less than 21 are required to register for English 110.

2. Refer to department or curriculum guide for course options.

HDE Leadership Council

The HDE Leadership Council acts as a liaison organization between the student body, the faculty, and the Dean of the College of Human Development and Education. The council assists in the promotion of the college. Student selection is based on academics and a willingness to participate. Student members represent each of the four units in the college. Applications for leadership council are reviewed each fall. Information is available in the Dean's Office of the college.

Student Advisors

Although each student in the college is assigned a faculty or professional advisor, selected students supplement and complement the existing advisory system. The student advisor program is designed to help incoming and transfer students make the best possible academic and social adjustments to the college and the university. Applications for student advisors are reviewed and selected each spring. Information is available in the Dean's Office of the college.

Cooperative Education

Cooperative Education, a program of the Career Center, offers undergraduate and graduate students an opportunity to integrate classroom study with paid, career related work experience for academic credit. Work may be full or part time. Credit is granted through Continuing Education and awarded directly by the Cooperative Education program. A Cooperative Education experience may substantially improve students' employment opportunities after graduation.

Department of Apparel, Design, and Hospitality Management

www.ndsu.edu/adfhm

Students graduating with majors in Apparel and Textiles, Hospitality and Tourism Management, or Interior Design have a strong general education component and specialized career preparation. Interdisciplinary curricula in the Department of Apparel, Design, and Hospitality Management may build upon economics and business, art, behavioral sciences, or natural sciences. The department offers three majors: Apparel and Textiles, Hospitality and Tourism Management, and Interior Design. Two options are available within Apparel and Textiles: apparel studies and retail merchandising. The retail merchandising option offers two emphasis areas: interior retail merchandising and textile product retail merchandising. There are options available within Hospitality and
Tourism Management: lodging, restaurant management, and event planning. Minors are available in each program. For more information about any of the programs, contact the department. New students are advised to contact the department prior to beginning their college work.

Enrichment Opportunities
The department supplements classroom learning through structured field experiences to hospitality operations, fashion, and design centers. Study tours to cities such as, Minneapolis, New York City, Kansas City, Chicago, and to cities around the globe are scheduled regularly.

Professional enrichment is possible through departmental affiliation with the Fashion Institute of Technology, New York City, or various Study Abroad programs. NDSU students who attend these institutions for a semester or a year gain valuable experience in a fashion, merchandising, hospitality and tourism management, or interior design environment. Students should prepare to do this experience during their junior and/or senior year. Additional information about these programs is furnished upon request.

Apparel and Textiles Major
Students are prepared for a variety of careers in the apparel and textile industry that range from product conception through distribution to the consumer. The Apparel and Textiles program focuses on both national and international aspects of the apparel and textile industry. This includes product development, manufacturing, quality control, wholesaling, retail merchandising, marketing, and product preservation.

Note: Apparel and Textiles transfer courses from other institutions must have grades of C or better to be accepted for the Apparel and Textiles program at NDSU.

Apparel Studies Option: Prepares students for careers in theatre costuming, costume curator, fashion journalism, product development, and other aspects of the fashion industry, depending on their focus. Students who choose this option must earn a minor from another department. For example, to pursue a career in fashion journalism, a minor in Journalism, Broadcasting, and Mass Communications Technology should be selected.

Retail Merchandising Option: Prepares students for buying, promotion, and retail or human resource management in retail stores. A minor in Business Administration and a field experience to reinforce classroom instruction are required with this option. Students have flexibility in creating a program focus by selecting one of the following emphasis areas:

Interior Retail Merchandising Emphasis Area: Prepares students for careers in retail and wholesale home and office furnishing businesses.

Textile Product Retail Merchandising Emphasis Area: Prepares students for introductory management or buying positions in soft goods retailing.

Fashion Institute of Technology Affiliation
The department has an arrangement with the Fashion Institute of Technology (FIT), New York City, where a qualified student may attend that institution for a semester or a full year as a visiting student. Summer School opportunities are also available. The approved credits earned at FIT will transfer to NDSU and will count toward graduation requirements. Students participating in the one-year visiting student program earn an associate degree from FIT. During the second year of study at NDSU, interested students should consult with their advisors to ensure full consideration of their application for the FIT, visiting student program. Admission should be made at least one year in advance. Students who participate in this program spend their last year of study attending FIT.

Sample '08-09 Curriculum

Sample '08-09 Curriculum
Apparel & Textiles - Apparel Studies Option

General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110a, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL 320, Business &amp; Prof Writing</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>MATH 104, Finite Mathematics or MATH 146, Applied Calc I or higher</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td></td>
</tr>
<tr>
<td>Including: FIT 114, Microcomputer packages or FIT 116, Bus Use of Computers</td>
<td></td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A):</td>
<td></td>
</tr>
<tr>
<td>ADHM 310, History of Fashion</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 410, Dress &amp; World Culture</td>
<td>3</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td></td>
</tr>
<tr>
<td>PSYC 111, Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W):</td>
<td></td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Cultural Diversity (D):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 410, Dress &amp; World Culture</td>
<td>3</td>
</tr>
<tr>
<td>Global Perspective (G):</td>
<td></td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>40-41</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD&amp;E 320, Professional Issues</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
</tr>
</tbody>
</table>

Major Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHM 150, Design Fundamentals-Lecture</td>
<td>1</td>
</tr>
<tr>
<td>ADHM 155, Apparel Construction &amp; Fit or</td>
<td></td>
</tr>
<tr>
<td>ADHM 370, Sewn-Prod Manufact. &amp; Analy.</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 171, Fashion Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 181, Aesth/Visual Analysis of Apparel</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 271, Visual Merchandising &amp; Promo</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 272, Product Development</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 366, Textiles</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 367, Textiles Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ADHM 385, Global Fashion Eon</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 481, A &amp; T Capstone Experience</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 486, Dress &amp; Human Behavior</td>
<td>3</td>
</tr>
<tr>
<td>COMM 216, Intercultural Comm or</td>
<td>3-6</td>
</tr>
<tr>
<td>COMM 271, Listen &amp; Nonverbal Comm or</td>
<td>3</td>
</tr>
<tr>
<td>COMM 308, Busn &amp; Prof Speaking or</td>
<td></td>
</tr>
<tr>
<td>COMM 315, Small Group Comm or</td>
<td>3</td>
</tr>
<tr>
<td>COMM 383, Organizational Comm I</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
</tr>
</tbody>
</table>

Related Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Electives</td>
<td></td>
</tr>
<tr>
<td>Minor &amp; Elective Requirements</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
</tr>
</tbody>
</table>

Curriculum Total (min). 122

1 Effective Fall 2007: students with composite ACT score of 21 or higher should register for English 110 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for ENGL 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum

Apparel & Textiles - Retail Merchandising Option

General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110a, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL 320, Business &amp; Prof Writing</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>MATH 104, Finite Mathematics or MATH 146, Applied Calc I or higher</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td></td>
</tr>
<tr>
<td>Including: FIT 114, Microcomputer packages or FIT 116, Bus Use of Computers</td>
<td></td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A):</td>
<td></td>
</tr>
<tr>
<td>PSYC 111, Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W):</td>
<td></td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Cultural Diversity (D):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 410, Dress &amp; World Culture</td>
<td>3</td>
</tr>
<tr>
<td>Global Perspective (G):</td>
<td></td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>40-41</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD&amp;E 320, Professional Issues</td>
<td>1</td>
</tr>
<tr>
<td>STAT 330, Intro Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
</tr>
</tbody>
</table>

Major Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHM 150, Design Fundamentals-Lecture</td>
<td>1</td>
</tr>
<tr>
<td>ADHM 171, Fashion Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 271, Visual Merchandising &amp; Promo</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 272, Product Development</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 366, Textiles</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 367, Textiles Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ADHM 372, Global Retailing</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 491, Seminar (Pre-Internship)</td>
<td>1</td>
</tr>
<tr>
<td>ADHM 496, Field Experience</td>
<td>3-6</td>
</tr>
<tr>
<td>COMM 216, Intercultural Comm or</td>
<td>3</td>
</tr>
<tr>
<td>COMM 271, Listen &amp; Nonverbal Comm or</td>
<td>3</td>
</tr>
<tr>
<td>COMM 308, Busn &amp; Prof Speaking or</td>
<td></td>
</tr>
<tr>
<td>COMM 315, Small Group Comm or</td>
<td>3</td>
</tr>
<tr>
<td>COMM 383, Organizational Comm I</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
</tr>
</tbody>
</table>

Related Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 102, Fund of Acc</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 350, Foundations of Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 360, Foundations of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 362, Foundations of Retailing</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 300–400 Level Electives</td>
<td>9</td>
</tr>
<tr>
<td>Electives (min)</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
</tr>
</tbody>
</table>

Focus Area 1: Textile Product Merchandising

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHM 181, Aesth/Visual Analysis of Apparel</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 496, Field Experience</td>
<td>3-6</td>
</tr>
<tr>
<td>ADHM 310, History of Fashion</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 370, Sewn-Prod Manufact. &amp; Analy.</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 385, Global Fashion Eon</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 486, Dress &amp; Human Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Professional Electives</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>21-24</td>
</tr>
</tbody>
</table>
The Hospitality and Tourism Management (HTM) major prepares students for one of these dynamic career paths with great opportunities for advancement. The Candlewood Suites, located directly on the NDSU campus in the Research and Technology Park, provides a fully equipped classroom, student lounge, and research office space where students and faculty can learn right where the action takes place.

Mission Statement
The mission of the Hospitality and Tourism Management (HTM) program is to develop leaders in the hospitality and tourism industry. To achieve this mission, it is our goal that students graduating from the HTM program at NDSU will demonstrate leadership skills by having the following: knowledge of the industry, management skills, problem solving abilities, and a sense of responsibility.

Hospitality and Tourism Management areas: Prepares students for careers in hotels, resorts, casinos, restaurants, and events management.

Sample '08-09 Curriculum

Hospitability and Tourism Management Major

General Education Requirements Credits
First Year Experience (F):
  HD&E 189, Skills for Academic Success 1
  Communications (C):
    COM 110, Fund of Public Speaking 3
    ENGL 1101, 120, College Comp I, II 3
    ENGL Upper Level Writing Course 3
  Quantitative Reasoning (Q) 3
  Science & Technology (S) 10
    Including: CSCI 144, Microcomputer Plgs or
    CSCI 116, Busn Use of Computers and
    CHEM 117, Chem Concepts & Appl or
    CHEM 121, General Chemistry I
  Humanities & Fine Arts (A) 6
  Social & Behavioral Sciences (B):
    PSYC 111, Intro to Psychology 3
    ECON 105, Elements of Economics 3
  Wellness (W) 2
  Cultural Diversity (D) 3
    Global Perspective (G) 3
    ECON 105, Elements of Economics 3

Total 40

College/Department Requirements Credits
HD&E 320, Professional Issues 1

Total 1

Major Requirements Credits
ADHM 140, Intro to Hospitality Industry 3
ADHM 141, Tourism & Travel Management 3
ADHM 241, Hospitality Accounting 3
ADHM 360, Front Office Management 3
ADHM 381, Hospitality Marketing & Sales 3
ADHM 435, Cost Control in Hosp & Food Svcs 3
ADHM 467, Hospitality Law 3
ADHM 479, Hospitality Industry Mgmt Strat 3
ADHM 491, Seminar 1
ADHM 496, Field Experience 3
HNES 141, Food Sanitation 1
HNES 261, Food Selection & Prep Principles 3
HNES 261L, Food Selection & Prep Prin Lab 2
Option Credits (choose 2 areas) 18-21

Total 52-55

Curriculum Total 122

Sample '08-09 Curriculum

Hospitality and Tourism Management Minor

Requirements
ADHM 140, Intro to Hospitality Industry 3
ADHM 141, Tourism & Travel Management 3
ADHM Electives 12

Total 18

Curriculum Total 29

Interior Design Major

The course of study in Interior Design leads to a first professional interior design degree. Students gain knowledge and experience in identifying, researching, and designing projects relative to the function and quality of an interior environment. Courses in design fundamentals, design analysis, space planning, interior construction, building systems and equipment, and technical communication prepare students to successfully complete studio projects in residential and commercial design (e.g., institutional, educational, hospitality, corporate, retail, health care).

Students learn several approaches to the design process, but all involve: analyzing client needs, goals, and life safety requirements; design concept development; developing and presenting design recommendations; and working drawings and specifications in compliance with universal accessibility guidelines and all applicable codes.

Students participate in an internship during the summer between their third and fourth years. This internship may or may not include a stipend to support that student while living away from campus or home.

The Interior Design major has four years of sequenced studio work. Enrollment in sophomore level interior design courses requires a 3.0 institutional cumulative grade-point average. Admission into the third-year studio is based upon demonstrated professional interest, a portfolio review completed during the spring semester of the student's sophomore year, a 3.0 institutional cumulative grade-point average, and a minimum grade of C in all major core requirements. Students must maintain the 3.0 minimum cumulative GPA requirement and earn a grade of "C" or better in all major core requirements throughout the remainder of the program. All students successfully completing sophomore review are required to purchase a laptop computer for upper division studio courses. Senior Interior Design students complete a capstone course that culminates the professional design educational experience.

The Interior Design program is accredited by the Council for Interior Design Accreditation.
Sample '08-'09 Curriculum

Interior Design Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F)</td>
<td>1</td>
</tr>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C)</td>
<td>12</td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 320, Business &amp; Prof Writing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 321, Writing in Tech Profession</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (Q)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 104, Finite Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 146, Applied Calc 1 or higher</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>CSCI 114, Microcomputer Packages or CSCI 116, Busn Use of Computers</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>ADHM 315, History of Interiors I</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 316, History of Interiors II</td>
<td>3</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>3</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total** 40-41

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 210, Art History I</td>
<td>1</td>
</tr>
<tr>
<td>ART 211, Art History II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total** 4

**Major Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHM 150, Design Fund Lecture</td>
<td>1</td>
</tr>
<tr>
<td>ADHM 151, Design Fund Studio</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 160, Interior Design Careers</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 161, Interior Graphics I</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 250, Interior Environmental Analysis</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 251, Int Design Studio I: Residential</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 253, Int Design II: Office Design</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 254, Int Design III: Small Scale Cont</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 261, Interior Design Graphics II</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 263, Construction Methods &amp; Tech</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 264, Residential Systems</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 300, Design Resource Mgmt</td>
<td>1-3</td>
</tr>
<tr>
<td>ADHM 351, Interior Design Studio IV: Ad Res</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 353, Int Design Studio V: Lg Scale Contr</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 362, Codes for Interiors</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 363, Comm Lighting Des &amp; Bldg Sys</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 365, CADD for Interiors</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 366, 367, Textiles, Lab</td>
<td>3, 1</td>
</tr>
<tr>
<td>ADHM 368, Interior Materials &amp; Maintenance</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 450, Rsh &amp; Project Dev in Int Design</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 452, Compr Int Design Project</td>
<td>6</td>
</tr>
<tr>
<td>ADHM 460, Career Dev &amp; Professional Practice</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 491, Seminar</td>
<td>2-3</td>
</tr>
<tr>
<td>ADHM 496, Field Experience</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total** 63

**Required Courses**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives</td>
<td>12</td>
</tr>
<tr>
<td>Total (min)</td>
<td>75</td>
</tr>
</tbody>
</table>

**Curriculum Total (min)** 122

---

Sample '08-'09 Curriculum

Interior Design Minor

**Requirements (Non-Architecture Majors)**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHM 150, Design Fundamentals Lecture</td>
<td>1</td>
</tr>
<tr>
<td>ADHM 151, Design Fundamentals Studio</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 160, Interior Design Careers</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 161, Interior Graphics I</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 250, Interior Environmental Analysis</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 251, Int Design Studio I: Residential</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 253, Int Design II: Office Design</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 254, Int Design III: Small Scale Cont</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 264, Residential Systems</td>
<td>2</td>
</tr>
<tr>
<td>ADHM 315, History of Interiors I</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 316, History of Interiors II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total** 20

**Curriculum Total**

---

Department of Child Development and Family Science

**www.ndsu.edu/cdfs**

The mission of the Department of Child Development and Family Science (CDFS) is to provide a comprehensive, integrated knowledge of families and individuals across the life span that will equip students for careers in helping professions and to enter graduate programs. The curriculum emphasizes practical application, acknowledging individuals and families as developing and changing entities within a larger societal context.

**Child Development and Family Science Major**

At the undergraduate level, the department offers a curriculum leading to a Bachelor of Science or Bachelor of Arts degree through three options: child development, family science, and child development/elementary education. Child Development and Family Science majors are prepared to work in a variety of areas related to children and families. Employment opportunities include parent and family life educators, extension agents, child protection service professionals, financial counselors, nursing home activity directors, credit specialists, probation agents, directors of child care licensing, and hospital child life specialists.

Coursework provides students with an ecological approach to the study of human development and families with emphasis on the interactions of individuals, families, and the broader environmental context. Allowing students to select electives within the department to specialize in careers of interest provides flexibility.

**Child Development Option**: This option prepares students for careers involving direct and support services for children and adolescents.

---

Family Science Option: This option allows students to take a concentration of courses in family science or family economics in preparation for careers in direct and support services for families.

Sample '08-'09 Curriculum

Child Development & Family Science Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F)</td>
<td>1</td>
</tr>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C)</td>
<td>12</td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3, 3</td>
</tr>
<tr>
<td>ENGL 358, Writing in Hum &amp; Soc Sci or ENGL 459, Rsh &amp; Writing Grants/Prop</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (Q)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 104, Finite Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Including: CSCI 114, Microcomputer Packages or CSCI 116, Busn Use of Computers</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>ADHM 316, History of Interiors I</td>
<td>3</td>
</tr>
<tr>
<td>ADHM 316, History of Interiors II</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total** 40

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD&amp;E 320, Professional Issues</td>
<td>1</td>
</tr>
<tr>
<td>Total (min)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Major Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDFS 135, Family Science</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 353, Children, Family/Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 403, Research Methods in CDFS</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 475, Children &amp; Fam Across Cultures</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 485, Capstone Experience or CDFS 491, Seminar: Senior Thesis</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 496, Field Experience</td>
<td>8</td>
</tr>
<tr>
<td>Electives</td>
<td>24</td>
</tr>
</tbody>
</table>

**Total** 57

**Option 1: Child Development**

**Credits**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDFS 320, Prenatal, Infant &amp; Toddler Dev</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 330, Child Development</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 450, Adolescent Development</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 460, Adult Development &amp; Aging</td>
<td>3</td>
</tr>
<tr>
<td>CDFS Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

**Total** 24

**Option 2: Family Science Option**

**Credits**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDFS 320, Life Span Development</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 341, Parent-Child Relations</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 357, Personal &amp; Family Finance</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 462, Risk, Resilience &amp; Compeit in Fam</td>
<td>3</td>
</tr>
<tr>
<td>CDFS Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

**Total** 24

**Curriculum Total (min)** 122

---

1 Effective fall 2007, students with composite ACT scores of 21 or higher should take English 120 (unless transfer credit for ENGL 120 is received): Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.

2 May double count with select Humanities & Fine Arts, Social & Behavioral Sciences and/or Science & Tech Gen Ed courses.

3 Refer to department or curriculum guide for course options.
### College/Department Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>College/Department</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 320, Professional</td>
<td>1</td>
</tr>
<tr>
<td>Issues</td>
<td></td>
</tr>
</tbody>
</table>

### CDFS/Elementary Education Dual Degree Program

The Child Development/Elementary Education option is a collaborative effort between NDSU and Valley City State University. Through this curriculum, offered on the NDSU campus, students are concurrently enrolled in both universities, culminating in a bachelor’s degree from NDSU in Child Development and Family Science (Child Development option) as well as a bachelor’s degree from VCSU in Elementary Education. Students are certified to teach Elementary Education in public schools and may, with additional course work and an additional student teaching experience, be certified to teach kindergarten as well. The CDFS degree complements and strengthens the Elementary Education curriculum and helps future teachers understand development and its diversity, making them more effective teachers and helping them work with children from a wide variety of backgrounds.

### Sample '08-'09 Curriculum Child Development/Elementary Education Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 189, Skills</td>
<td>1</td>
</tr>
<tr>
<td>for Academic Success</td>
<td></td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public</td>
<td>3</td>
</tr>
<tr>
<td>Speaking</td>
<td></td>
</tr>
<tr>
<td>ENGL 110, 120, College</td>
<td>3</td>
</tr>
<tr>
<td>Comp I, II</td>
<td></td>
</tr>
<tr>
<td>ENGL 358, Writing</td>
<td>3</td>
</tr>
<tr>
<td>in Hum &amp; Soc Sci</td>
<td></td>
</tr>
<tr>
<td>ENGL 459, Research</td>
<td>3</td>
</tr>
<tr>
<td>&amp; Writing</td>
<td></td>
</tr>
<tr>
<td>Grants/Prop</td>
<td></td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td></td>
</tr>
<tr>
<td>MATH 103, College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 104, Finite</td>
<td></td>
</tr>
<tr>
<td>Mathematics Science</td>
<td></td>
</tr>
<tr>
<td>&amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>BIOL Gen Ed Course</td>
<td>3</td>
</tr>
<tr>
<td>CHEM or PHYS Gen Ed</td>
<td>3</td>
</tr>
<tr>
<td>Course</td>
<td></td>
</tr>
<tr>
<td>GEOL 105, Physical Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 106, Earth Through</td>
<td>3</td>
</tr>
<tr>
<td>Time</td>
<td></td>
</tr>
<tr>
<td>Co-requisite Lab</td>
<td></td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral</td>
<td></td>
</tr>
<tr>
<td>Sciences (B):</td>
<td></td>
</tr>
<tr>
<td>PSYC 111, Intro to</td>
<td>3</td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
</tr>
<tr>
<td>PSYC 250, Developmental</td>
<td>3</td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
</tr>
<tr>
<td>Wellness (W):</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D):</td>
<td></td>
</tr>
<tr>
<td>CDFS 475, Child &amp; Fam</td>
<td></td>
</tr>
<tr>
<td>Across Cultures</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G):</td>
<td></td>
</tr>
<tr>
<td>GEOL 105, Physical Geology</td>
<td></td>
</tr>
<tr>
<td>GEOL 106, Earth Through</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td></td>
</tr>
</tbody>
</table>

**Total**                     | 40      |

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD&amp;E 320, Professional</td>
<td>1</td>
</tr>
<tr>
<td>Issues</td>
<td></td>
</tr>
</tbody>
</table>

**Major/Related Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDFS 135, Family Science</td>
<td></td>
</tr>
<tr>
<td>CDFS 320, Prenatal, Infant</td>
<td></td>
</tr>
<tr>
<td>&amp; Toddler Development</td>
<td></td>
</tr>
<tr>
<td>CDFS 330, Child Development</td>
<td></td>
</tr>
<tr>
<td>CDFS 475, Childern &amp; Fam</td>
<td></td>
</tr>
<tr>
<td>Across Cultures</td>
<td></td>
</tr>
<tr>
<td>CSCI 114, Microcomputer</td>
<td></td>
</tr>
<tr>
<td>Packages or</td>
<td></td>
</tr>
<tr>
<td>CSCI 116, Business Use</td>
<td></td>
</tr>
<tr>
<td>of Computers</td>
<td></td>
</tr>
<tr>
<td>GEGO 111, Survey of</td>
<td></td>
</tr>
<tr>
<td>Geography</td>
<td></td>
</tr>
<tr>
<td>HIST 103, U.S. to 1877</td>
<td></td>
</tr>
<tr>
<td>or HIST 104, U.S. to</td>
<td></td>
</tr>
<tr>
<td>1877</td>
<td></td>
</tr>
<tr>
<td>MATH 277, Math for</td>
<td></td>
</tr>
<tr>
<td>Elementary Teachers I</td>
<td></td>
</tr>
<tr>
<td>MATH 278, Math for</td>
<td></td>
</tr>
<tr>
<td>Elementary Teachers II</td>
<td></td>
</tr>
<tr>
<td>CDFS Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

**Total**                     | 37      |

**Professional Education Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 250, Intro to</td>
<td>3</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>EDUC 210, Creative</td>
<td>2</td>
</tr>
<tr>
<td>Activities</td>
<td></td>
</tr>
<tr>
<td>EDUC 240, Educ Exceptional</td>
<td>2</td>
</tr>
<tr>
<td>Students</td>
<td></td>
</tr>
<tr>
<td>EDUC 300, Educational</td>
<td>2</td>
</tr>
<tr>
<td>Technology</td>
<td></td>
</tr>
<tr>
<td>EDUC 315, Math in the</td>
<td>2</td>
</tr>
<tr>
<td>Elementary School</td>
<td></td>
</tr>
<tr>
<td>EDUC 320, Social Studies/</td>
<td>2</td>
</tr>
<tr>
<td>Elementary School</td>
<td></td>
</tr>
<tr>
<td>EDUC 321, Foundations of</td>
<td>2</td>
</tr>
<tr>
<td>Reading Instr</td>
<td></td>
</tr>
<tr>
<td>EDUC 322, Methods of Lang</td>
<td>2</td>
</tr>
<tr>
<td>Arts Inst I</td>
<td></td>
</tr>
<tr>
<td>EDUC 323, Methods of</td>
<td>2</td>
</tr>
<tr>
<td>Read in Elem School</td>
<td></td>
</tr>
<tr>
<td>EDUC 330, Children's</td>
<td>2</td>
</tr>
<tr>
<td>Literature</td>
<td></td>
</tr>
<tr>
<td>EDUC 350, Elementary</td>
<td>2</td>
</tr>
<tr>
<td>School Practicum</td>
<td></td>
</tr>
<tr>
<td>EDUC 352, Culturally</td>
<td>2</td>
</tr>
<tr>
<td>Diverse Practicum</td>
<td></td>
</tr>
<tr>
<td>EDUC 355, Science Methods</td>
<td>2</td>
</tr>
<tr>
<td>/Elem Teachers</td>
<td></td>
</tr>
<tr>
<td>EDUC 400, Educational</td>
<td>2</td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
</tr>
<tr>
<td>EDUC 450, Current Issues</td>
<td>2</td>
</tr>
<tr>
<td>&amp; Trends in Educ</td>
<td></td>
</tr>
<tr>
<td>EDUC 489, Native Amr</td>
<td>3</td>
</tr>
<tr>
<td>&amp; Multicol Inst Prac</td>
<td></td>
</tr>
<tr>
<td>EDUC 490, Student Teaching</td>
<td>3</td>
</tr>
<tr>
<td>(Elementary)</td>
<td></td>
</tr>
<tr>
<td>Directed Electives (VCSU</td>
<td>10</td>
</tr>
<tr>
<td>courses at NDSU)</td>
<td></td>
</tr>
</tbody>
</table>

**Total**                     | 54      |

**Curriculum Total**          | 132     |

1 Refer to department or curriculum guide for course options.

### CDFS Minor

The Child Development and Family Science minor is especially appropriate for students majoring in the social or behavioral sciences and other students planning careers that involve work with people. Of the 18 credits required for the minor, at least nine credits must be upper division, and no more than three credits may be in field experience, practicum, or student teaching. Some CDFS courses also apply to interdisciplinary minors in Women’s Studies and Gerontology.

### Sample '08-'09 Curriculum Child Development & Family Science Minor

**Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDFS 135, Family Science</td>
<td></td>
</tr>
<tr>
<td>CDFS 230, Life Span</td>
<td>3</td>
</tr>
<tr>
<td>Development</td>
<td></td>
</tr>
<tr>
<td>CDFS Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

**Total**                     | 18      |

1 Refer to department for course options.

### Sample '08-'09 Curriculum Individual & Family Wellness Minor

**Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNES 220, Individual &amp;</td>
<td></td>
</tr>
<tr>
<td>Family Wellness</td>
<td></td>
</tr>
<tr>
<td>ADHM/CDFS/HNES/EDUC/H&amp;CE</td>
<td>14</td>
</tr>
<tr>
<td>Electives1</td>
<td></td>
</tr>
</tbody>
</table>

**Total**                     | 16      |

1 Refer to department for course options.

### Department of Health, Nutrition and Exercise Science

www.ndsu.edu/HNES

This department offers all students an opportunity to develop skills and knowledge that are vital in developing a personal, lifetime wellness concept and to serve as teachers, leaders, and administrators of health, physical education, recreation, athletic training (see online graduate catalog), and dietetics. Majors are available in Dietetics, Health Education, Exercise Science, Physical Education, and Sport and Recreation Studies. Minors offered are Coaching, Health Education, Physical Education, and Food Science.

### Athletic Training Major

NDSU has suspended the Bachelor of Science in Athletic Training program and no longer admits new students to this degree program. Students who wish to attend NDSU for athletic training are advised to major in Exercise Science, Physical Education, or Health Education and apply to the M.S. degree program in HNES: Entry Level Athletic Training option program. After completing a chosen bachelor’s degree and the Entry Level M.S. program, a student will be eligible to take the BOG exam, earn the ATC credential, and find employment as an athletic trainer.

### Dietetics Major

There are two options within the Dietetics major: (a) Coordinated Program and (b) Didactic Program. Both programs include all didactic courses required for membership in The American Dietetic Association.

Students with a major in Dietetics are employed in many settings such as hospitals, clinics, community health programs, businesses, industries, school food services, and as consultants in homes for the elderly and other service institutions. Research and development opportunities are available in industry, government, and universities; in regulation of food quality through government agencies; and within companies as communication specialists.

### Family Therapy Center

The Family Therapy Center is located on the NDSU campus. The center is an accredited training program administered through the Department of Child Development and Family Science at NDSU. NDSU faculty members who are clinical members and approved supervisors of the American Association for Marriage and Family Therapy supervise advanced clinical students.

### Center for Child Development

The CCD is a laboratory school, accredited by the National Academy of Early Childhood Programs, which provides opportunities for NDSU students to observe, do research, and participate in a high quality program for young children and their families.

### Coordinated Program in Dietetics (CPD) Option

This option prepares professional dietetic practitioners for work in entry-level positions in hospitals, nursing homes, out-patient clinics, businesses, and community agencies.

Acceptance into CPD is competitive and enrollment is limited. Students who have completed the prerequisite courses apply for admission in February. The American Dietetic Association/Council on Education Accreditation/Approval for Dietetic Education accredits the CPD. Graduates are eligible to take the registration exam for dietitians upon completion of the program.
### Sample '08-'09 Curriculum

#### Dietetics Major - Coordinated Program in Dietetics (CPD) & Didactic Program in Dietetics (DPD)

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>3</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>STAT 330, Intro Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>BIOL 220, Human Anat/Physiology I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121, General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121L, General Chemistry I</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 122, General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td></td>
</tr>
<tr>
<td>PSYC 111, Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W):</td>
<td></td>
</tr>
<tr>
<td>HNES 250, Nutrition Science</td>
<td>3</td>
</tr>
<tr>
<td>Cultural Diversity (D):</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 111, Intro to Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>Global Perspective (G):</td>
<td>3</td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

#### College/Department Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICR 202, Intro to Microbiology</td>
</tr>
<tr>
<td>MICR 202L, Intro to Microbiology Lab</td>
</tr>
<tr>
<td>BIOL 221, Human Anat &amp; Physiology I</td>
</tr>
<tr>
<td>HNES/CDFS/PSYC/SOC Elective</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

#### Major Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 260, Elements of Biochemistry</td>
</tr>
<tr>
<td>BUSN 350, Found of Management</td>
</tr>
<tr>
<td>CHEM 240, Survey of Organic Chemistry</td>
</tr>
<tr>
<td>HNES 141, Food Sanitation</td>
</tr>
<tr>
<td>HNES 251, Nutrition, Growth &amp; Development</td>
</tr>
<tr>
<td>HNES 260, AT Medical Terminology</td>
</tr>
<tr>
<td>HNES 261, Food Selection &amp; Preparation</td>
</tr>
<tr>
<td>HNES 261L, Food Selection &amp; Prep Lab</td>
</tr>
<tr>
<td>HNES 291, Intro to Dietetics</td>
</tr>
<tr>
<td>HNES 351, Metabolic Basis of Nutrition</td>
</tr>
<tr>
<td>HNES 354, Intro to Med Nutrition Therapy</td>
</tr>
<tr>
<td>HNES 361, Food Production Mgt</td>
</tr>
<tr>
<td>HNES 361L, Food Production Mgt Lab</td>
</tr>
<tr>
<td>HNES 442, Comm Health &amp; Nutrition Ed</td>
</tr>
<tr>
<td>HNES 442L, Comm Health &amp; Nutrition Ed Lab</td>
</tr>
<tr>
<td>HNES 458, Adv Med Nutrition Therapy</td>
</tr>
<tr>
<td>HNES 460, Foodservice Systems</td>
</tr>
<tr>
<td>MATH 103 or 104</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Pre-Professional/Professional Emphasis

Students are admitted to the Pre-Professional emphasis in ES when declaring the major. The Pre-Professional emphasis encompasses the freshman year; transfer students are also placed in the Pre-Professional emphasis upon acceptance to the university. Entrance into the Professional Emphasis occurs for freshman during the second semester of attendance; for transfer students, application occurs during the first semester of attendance.

The following requirements must be met before beginning the professional course ( sophomore, junior and senior level courses with prefix HNES) of study:

1. Successful completion of HNES 170 with a grade of “C” or better.
2. Minimum NDSU GPA of 2.75 or higher

### Retention Standards

Students must meet all of the retention standards (per semester) in order to maintain their status in the ES professional phase.

1. A passing grade must be earned in BIOL 220/220 Lab and BIOL 221/221 Lab (Human Anatomy and Physiology I and II).
2. Students must receive a “C” or higher in all HNES ES curriculum courses.
3. Maintain an overall GPA of 2.75 on a 4.0 scale.

### Sample '08-'09 Curriculum

#### Exercise Science Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>3</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>MATH 104, Finite Math or higher</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>CSCI 114, Microcomputer Packages</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 116, Busn Use of Computers</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 220, Human Anat &amp; Physiology I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 220L, Human Anat &amp; Physiology II</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 117, Chemical Concepts &amp; Appl</td>
<td>3</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>3</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td></td>
</tr>
<tr>
<td>ECON 105, Elements of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W):</td>
<td></td>
</tr>
<tr>
<td>HNES 250, Nutrition Science</td>
<td>3</td>
</tr>
<tr>
<td>Cultural Diversity (D):</td>
<td>3</td>
</tr>
<tr>
<td>Global Perspective (G):</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41-42</strong></td>
</tr>
</tbody>
</table>

#### Major Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 221, Human Anat &amp; Physiology I</td>
</tr>
<tr>
<td>BIOL 221L, Human Anat &amp; Physiology II Lab</td>
</tr>
<tr>
<td>HNES 170, Intro to Health, Nutr &amp; Exer Sci</td>
</tr>
<tr>
<td>HNES 170, Intro to Exercise Science</td>
</tr>
<tr>
<td>HNES 271, Tech of Strength Conditioning</td>
</tr>
<tr>
<td>HNES 272, Tech of Cardio Conditioning</td>
</tr>
<tr>
<td>HNES 365, Kinesiology</td>
</tr>
<tr>
<td>HNES 368, Biomechanics of Exercise</td>
</tr>
<tr>
<td>HNES 370, Activity Benefits/Exercise Presci</td>
</tr>
<tr>
<td>HNES 371, Fitness Programming/Mgmt</td>
</tr>
<tr>
<td>HNES 455, Sports Nutrition</td>
</tr>
<tr>
<td>HNES 465, Physiology of Exercise</td>
</tr>
<tr>
<td>HNES 466, Physiology of Exercise Lab</td>
</tr>
<tr>
<td>HNES 467, EKG Monitoring</td>
</tr>
<tr>
<td>HNES 472, Aerobic Fitness Assoc &amp; Tech</td>
</tr>
<tr>
<td>HNES 473, Adv Resistance Training</td>
</tr>
</tbody>
</table>
Physical Education Major
To be successful in the field, a physical education student must like to work with people, be adequately skilled in physical activities, have a commitment to fitness and be interested in the physical, biological and social sciences. NDSU offers two physical education options: Physical Education Teaching and Community Sports.

Physical Education Teaching Option
The physical education teaching option emphasizes teaching and provides students with skills and techniques necessary to have a successful career in K-12 physical education. The program is aligned with the National Association for Sport and Physical Education's (NASPE) Physical Education Teacher Education (PETE) Standards. The courses are strategically structured to be sequential in nature.

Teaching—School of Education
It is recommended that students apply to the School of Education (SOE) in the spring semester of their third year in the program. Completing the degree requirements for a Physical Education degree in the School of Education certifies a graduate to teach physical education from kindergarten through grade 12. Students may choose to enrich their background by selecting a major in Health Education.

The student majoring in physical education will be studying the art and science of human movement, which includes classes in elementary, middle, and high school activities; motor learning, physiology and psychology of human movement; the art of teaching and motivating potential of all individuals; and appreciation of the individual differences of all people and their communication skills.

Graduates are prepared to teach in a professional manner, while demonstrating exemplary ethical behavior, and displaying up-to-date “best practices.” Graduates are expected to serve as positive role models for K-12 students in the area of physical education, physical activity and sport.

Community Sports Option
This non-teaching degree is for those who have a passion for sport, a desire to make a difference in the lives of children and/or athletes, and the dedication to strive for personal excellence. Similar to the teaching option, students will have the opportunity to complete a culminating field experience working hands-on with a sports program of their choice.

Double Major and/or Minor
Because of No Child Left Behind legislation, it is strongly recommended that physical education majors double major in health education and/or pursue a coaching minor.

Sample '08-'09 Curriculum
Physical Education Major
General Education Requirements
- First Year Experience (F):
  - HD&E 189, Skills for Academic Success
- Communications (C):
  - COMM 110, Fund of Public Speaking
  - ENGL 110, 120, College Comp I, II
  - ENGL 358, Writing in Humanities/Soc Sci
- Quantitative Reasoning (R)
- Science & Technology (S)
  - Including: CSCI 114, Microcomputer Packages or CSCI 116, Busn Use of Computers
- BIOL 220, Human Anar & Physiology I
- BIOL 220L, Human Anar & Physiology II
- Humanities & Fine Arts (A)
- Social & Behavioral Sciences (B)
  - PSYC 111, Intro to Psychology
  - SOC 110, Intro to Sociology
- Wellness (W):
  - HNES 217, Personal & Comm Health
  - Cultural Diversity (D)
  - Global Perspective (G)
- Total

College/Department Requirements
- HD&E 320, Professional Issues
- Total

Major Requirements
- HNES 110, Intro to HNES
- HNES 154, Prof Prep in Elem School Act
- HNES 210, First Aid & CPR
- HNES 253, Motor Learning & Performance
- HNES 255, Prof Prep in Middle School Phys Ed
- HNES 256, Prof Prep in HS Phys Ed
- HNES 367, Principles of Conditioning
- CDFS 230, Life Span Development or
  - PSYC 250, Developmental Psych
- Additional Major/Minor Electives
- Total

Physical Education Minor
Requirements
- HNES 210, First Aid & CPR
- HNES 300, Curr Stand & Assess in Phys Ed
- HNES 352, Phys Educ Activities & Materials
- HNES 367, Principles of Conditioning
- EDUC 481, Clrn Pract/Meth of Teach K-12
- HNES 154, Prof Prep in Elem School Act
- HNES 255, Prof Prep in Mid Sch Phy Ed or
  - HNES 256, Prof Prep in HS Phys Ed
- Total

Education Health Program
The Health Education major emphasizes comprehensive health education and is designed to prepare students for careers in the field of community health education and/or school health education through the development of dispositions, knowledge and skills.

Community Health Education - Option
This non-teaching major is offered for students interested in pursuing community health, health promotion or work-site careers in the public sector.

School Health Education - Teaching Option
This professional teaching preparation program is designed primarily to meet the needs of those interested in a teaching career.
### Teaching — School of Education

Completing the degree requirements for a health education degree in the School of Education certifies a graduate to teach health education at the secondary level. Students may choose to enrich their background by selecting a major in physical education. It is recommended that students apply to the School of Education (SOE) in the spring semester of their third year in the program.

### Double Major

Because of the No Child Left Behind legislation, it is strongly recommended that health education teaching majors double major in physical education-teaching option.

### Physical Education Major:

For further information about the physical education teaching option, please refer to the Physical Education curriculum guide or contact the department advisor.

### Sample '08-09 Curriculum

#### Health Education

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Including: CSCI 114, Microcomputer Packages or CSCI 116, Busn Use of Computers</td>
<td></td>
</tr>
<tr>
<td>BIOL 220, Human Anat &amp; Physiology I</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 220L, Human Anat &amp; Physiology II</td>
<td>1</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td></td>
</tr>
<tr>
<td>PSYC 111, Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W):</td>
<td></td>
</tr>
<tr>
<td>HNES 217, Personal &amp; Comm Health</td>
<td>3</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40-41</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>College/Department Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD&amp;E 320, Professional Issues</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 221, Human Anat &amp; Physiology I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 221L, Human Anat &amp; Physiology II Lab</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements (both options)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDFS 135, Family Science</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 230, Life Span Development or</td>
<td></td>
</tr>
<tr>
<td>PSYC 250, Developmental Psych.</td>
<td>3</td>
</tr>
<tr>
<td>HNES 110, Intro to HNES</td>
<td>1</td>
</tr>
<tr>
<td>HNES 160, Found of Health Prof.</td>
<td>2</td>
</tr>
<tr>
<td>HNES 210, First Aid &amp; CPR</td>
<td>2</td>
</tr>
<tr>
<td>HNES 200, Prin of Nutrition or HNES 250, Nutrition Science</td>
<td>3</td>
</tr>
<tr>
<td>HNES 341, Psycho/Social Aspects of Health</td>
<td>3</td>
</tr>
<tr>
<td>HNES 345, Materials &amp; Concepts of Health Ed</td>
<td>3</td>
</tr>
<tr>
<td>HNES 445, Org/Admin of Coord Health Pgm.</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 210, Human Sexuality</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 212, Psych Aspects Drug Use/Abuse</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29</strong></td>
</tr>
</tbody>
</table>

### Option 1: Community Health

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 330, Intro Statistics</td>
</tr>
<tr>
<td>SOC 203, Minorities &amp; Race Relations</td>
</tr>
<tr>
<td>COMM 380, Health Comm I</td>
</tr>
<tr>
<td>HNES 251, Nutrition, Growth, &amp; Development</td>
</tr>
<tr>
<td>HNES 442, Community Health &amp; Nutrition Ed</td>
</tr>
<tr>
<td>HNES 452, Nutrition, Health &amp; Aging</td>
</tr>
<tr>
<td>HNES 482, Community Health Internship</td>
</tr>
<tr>
<td>Minor/Electives (min)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Option 2: School Health Option

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 321, Intro to Teaching</td>
</tr>
<tr>
<td>EDUC 322, Educational Psychology</td>
</tr>
<tr>
<td>EDUC 381, Early Experience</td>
</tr>
<tr>
<td>EDUC 451, Instruc, Planning, Meth &amp; Assess</td>
</tr>
<tr>
<td>EDUC 481, Classroom Prac/Meth of Teach Health Ed K-12</td>
</tr>
<tr>
<td>EDUC 485, Student Teach Seminar</td>
</tr>
<tr>
<td>EDUC 486, Classroom Mgt of Diverse Learner</td>
</tr>
<tr>
<td>EDUC 487, Student Teaching</td>
</tr>
<tr>
<td>EDUC 488, Applied Student Teaching</td>
</tr>
<tr>
<td>EDUC 489, Nat American/Multicult Inst Prac.</td>
</tr>
<tr>
<td>Minor/Electives (min)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### Curriculum Total (either option)

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENG 120 is received).

### Health Education Minor

Students who have earned a Health Education minor as a complement to their major have majored in the following curricula: Child Development and Family Science, Dietetics, Exercise Science, Health Communications, Nursing, and Sport and Recreation Management.

### Sample '08-09 Curriculum

#### Health Education Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNES 210, First Aid &amp; CPR</td>
<td>2</td>
</tr>
<tr>
<td>HNES 217, Personal &amp; Community Health</td>
<td>3</td>
</tr>
<tr>
<td>HNES 345, Materials &amp; Concepts of Health Ed</td>
<td>3</td>
</tr>
<tr>
<td>HNES 445, Org &amp; Admin of School Health Prog</td>
<td>3</td>
</tr>
<tr>
<td>HNES 200, Prin of Nutrition or HNES 250, Nutrition Science</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 212, Psych Aspects/Drugs Use/Abuse or PSYC 210, Human Sexuality</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

### Sport and Recreation Studies Major

The Sport and Recreation Studies major (SRS) is designed to prepare students for careers in Sport Management organizations and Recreation Management organizations. SRS has two study options including:

- The Sport Management (SM) option is structured to prepare students for employment in local, state, regional, national or international level sport organizations.

  The SM option’s major area of coursework includes 72 credit hours, 12 of which are taken in the final semester of the senior year as an internship at an approved local, state, regional, national or inter-national level sport organization.

To enhance employment prospects, undergraduate candidates in the SM option are encouraged to consider completion of a supporting minor, such as in business or communication.

### Sample ‘08-09 Curriculum

#### Sport & Recreation Studies

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 320, Busn &amp; Professional Comm</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td></td>
</tr>
<tr>
<td>Including: CSCI 116, Business Use of Computers</td>
<td></td>
</tr>
<tr>
<td>HNES 100, Concepts of Fit &amp; Activities</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements (both options)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNES 110, Intro to Health, Nutr, Exer Sci</td>
<td>1</td>
</tr>
<tr>
<td>HNES 190, Intro to Sport &amp; Rec Studies</td>
<td>2</td>
</tr>
<tr>
<td>HNES 210, First Aid &amp; CPR</td>
<td>2</td>
</tr>
<tr>
<td>HNES 336, Methods of Coaching</td>
<td>3</td>
</tr>
<tr>
<td>HNES 426, Sport &amp; Rec Administration</td>
<td>3</td>
</tr>
<tr>
<td>HNES 431, Governance in Sport</td>
<td>3</td>
</tr>
<tr>
<td>HNES 491, Seminar (Prior to Internship)</td>
<td>1</td>
</tr>
<tr>
<td>ACCT 200, Elem of Accounting I</td>
<td>1</td>
</tr>
<tr>
<td>ACCT 201, Elem of Accounting II</td>
<td>2</td>
</tr>
<tr>
<td>BUSN 350, Found of Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 431, Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 432, Business Law II</td>
<td>3</td>
</tr>
<tr>
<td>COMM 112, Understanding Media</td>
<td>3</td>
</tr>
<tr>
<td>COMM 250, Intro to Media Writing</td>
<td>3</td>
</tr>
<tr>
<td>COMM 260, Prin of Intern Web Based Des.</td>
<td>3</td>
</tr>
<tr>
<td>COMM 310, Advance Media Writing</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 210, Ethics or PHIL 216, Business Ethics or PHIL 101, Intro to Philosophy</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option 1: Recreation Management</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNES 196, Field Experience</td>
<td>2</td>
</tr>
<tr>
<td>HNES 225, Camp Mgmt &amp; Outdoor Rec Skills</td>
<td>3</td>
</tr>
<tr>
<td>HNES 326, Recreation Programming</td>
<td>3</td>
</tr>
<tr>
<td>HNES 427, Leisure &amp; Society</td>
<td>3</td>
</tr>
<tr>
<td>HNES 249, Recreation Internship (capstone)</td>
<td>12</td>
</tr>
<tr>
<td>COMM 261, Intro to Web Development</td>
<td>3</td>
</tr>
<tr>
<td>Minor/Electives (min)</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>37</strong></td>
</tr>
</tbody>
</table>
## School of Education

**www.ndsu.edu/education**

Students contemplating careers in education may be encouraged to learn there is a shortage of teachers in certain academic and geographical areas. This trend, together with the knowledge that preparation in teaching may also lead to successful careers in business, industry, and the public sector, may make education an excellent choice for versatile careers.

Programs in education at NDSU are administered by the School of Education. The School of Education programs are accredited at the undergraduate and graduate levels by the National Council for Accreditation of Teacher Education (NCATE) and are approved by the North Dakota Education Standards and Practices Board. NCATE accreditation assures that graduates of the program may be certified/licensed as teachers in other states, and also indicates that the programs offered through the School of Education are of high quality.

Through the School of Education, students are prepared to be teachers, counselors, and school administrators capable of working effectively with diverse populations. Through course work and field experiences, students come to an appreciation of and commitment to cultural diversity and to the elimination of inequitable instructional and institutional practices.

### Note:
The Consult the School of Education regarding transfer credits.

### Admission to the School of Education

Application forms and instructions for admission to the School of Education are available at the Teacher Education Office, 155 E. Morrow Lebedeff Hall. Students should check the School of Education Web site or contact the School of Education office for updates in procedures and requirements.

Students should apply for admission to the School of Education immediately following the introductory professional education course (EDUC 321). Late application may delay completion of program and graduation requirements. All applications to the school will remain valid for five years from the date of approval or until completion of the baccalaureate degree, whichever comes first.

The Council for Teacher Education reviews and acts upon completed applications. The Council is the body within the School of Education with jurisdiction over such matters as admission, retention, student teaching, and certification/licensure. The Council informs the students of its action. For questions about admission policies, contact the Teacher Education Office.

### Admission of Undergraduate Students

Undergraduate students may gain admission to the School of Education by meeting the following requirements:

1. Provide evidence of maintaining a minimum grade-point average of 2.75 in the student's total academic program. Transfer students shall complete a minimum of one semester's work and obtain a 2.75 institutional grade-point average at NDSU before their applications are processed.
2. Provide evidence of achieving passing scores on the Praxis I test of basic skills. (The student is responsible for registering for the test and paying the appropriate fee.)
3. Provide evidence of competence in English through any one of the following:
   - Minimum ACT English test standard score of 20
   - Minimum grade-point average of 2.50 in English 110 and 120 or equivalent
   - Minimum of a B grade in English 358 or equivalent writing course
4. Complete EDUC 321 with a grade of C or better.
5. Provide a letter of recommendation.
6. Provide portfolio reflections (started in EDUC 321) on TaskStream.
7. Complete 40 hours working with youth.
8. Submit completed curriculum guide.
9. Interview with Teacher Education faculty. Check with the Teacher Education office for sign up information.

Students should submit a completed application for admission the semester following completion of EDUC 321. Up-to-date transcripts of all college-level work must accompany the application.

### Admission of Post-Baccalaureate Students

Students with college degrees seeking teacher certification/licensure should contact the School of Education certification officer for more information.

NDSU students who continue in school after graduation or who resume their education within one year following graduation will be considered on the same basis as undergraduates.

Students whose undergraduate academic average was below 2.75 shall increase their overall undergraduate grade-point average to 2.75 or achieve and maintain an average of 3.00 on post-baccalaureate course work while meeting the following conditions:

1. Obtain 24 approved credits in two contiguous semesters, or equivalent.
2. Take each course for a grade other than pass/fail.
3. Obtain approval of all courses from the Teacher Education program.

Post-baccalaureate students must submit an application showing evidence of meeting the requirements listed under “Admission of Undergraduate Students.”

### Note:
These policies refer to admission to Teacher Education for purposes of certification/licensure and are not recommendations for admission to Graduate School.

### Student Teaching Policies

Prior to student teaching, all students must meet all School of Education requirements including completion and submission of the verification of requirements form (available from the Teacher Education Office). Because student teaching is a full-time experience, students shall not participate in extracurricular activities on campus or participate in employment that detracts from student teaching and shall not be registered for course work other than student teaching (EDUC 487, 488) and EDUC 485. A student teaching course fee is assessed.

### Program Exit Requirements

1. Students must complete a portfolio developed throughout the professional education courses based on the Interstate New Teachers Assessment and Support Consortium (INTASC) standards.
2. Students must earn a minimum GPA of 2.75 in each of the following programs:
   - Total academic programs
   - Teaching specialties
   - Professional education courses consisting of a minimum of 27 credits
3. Students may complete an application for state certification/licensure and pay the appropriate fee to the state upon completion of the program. Application forms for some states are available from the certification officer.

### Special Notice

Changes in national and state legislation, standards, or rules may result in revised course work requirements. Students should contact the School of Education to keep abreast of possible developments in curriculum areas.

### NDSU Student Education Association

Students in Teacher Education are encouraged to join the NDSU Student North Dakota Education Association, which is affiliated with the Student North Dakota Education Association and the National Education Association Student Program. Members of this organization receive a number of benefits including workshops, publications, and liability insurance, and have the opportunities to be involved with many of the committees that govern the Teacher Education program at NDSU.

Persons interested in membership details should contact the School of Education or the SNDEA Student Program advisor.

Students also are encouraged to join the professional organization(s) relevant to their teaching specialties.

### Graduation Requirements

Graduation requirements for all students desiring teacher certification/licensure, secondary or K-12, include three basic parts: general education requirements, professional education requirements, and teaching specialty requirements.

### General Education Requirements

<table>
<thead>
<tr>
<th>Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD&amp;E 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communication</td>
<td>12</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences</td>
<td>6</td>
</tr>
<tr>
<td>Wellness</td>
<td>2</td>
</tr>
</tbody>
</table>

### Professional Education Requirements

<table>
<thead>
<tr>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUC 321, Intro to Teaching</td>
</tr>
<tr>
<td>EDUC 322, Educational Psychology</td>
</tr>
<tr>
<td>EDUC 381, Early Experience</td>
</tr>
<tr>
<td>EDUC 489, Nat Am/Multicultural Instr Prac</td>
</tr>
<tr>
<td>EDUC 451, Inst Planning, Meth, &amp; Assess</td>
</tr>
<tr>
<td>EDUC 481, Classroom Prac/Methods of Teaching</td>
</tr>
<tr>
<td>EDUC 485, Student Teaching Seminar</td>
</tr>
<tr>
<td>EDUC 486, Classroom Mgt of Diverse Learners</td>
</tr>
<tr>
<td>EDUC 487, Student Teaching</td>
</tr>
<tr>
<td>EDUC 488, Applied Student Teaching</td>
</tr>
</tbody>
</table>

Additional credits are required for programs in Agricultural Education, English Education, Family and Consumer Sciences Education, Music Education, and Physical Education.
Teaching Specialty
(See the School of Education for requirements for the following):
Agricultural Education  Health
Biological Sciences  History
Chemistry  Mathematics
Comprehensive Science  Music
Earth Science  Physical Education
English  Physics
Family & Consumer Sciences  Social Sciences
French  Spanish

Human and Community Education
State approved programs for the preparation of vocational education teachers are grouped under Human and Community Education (H&CE). Curricula in two areas are offered: Agricultural Education and Family and Consumer Sciences Education.

Agricultural Education
NDSU is designated by the State Board for Career and Technical Education as the recognized institution for preparing teachers of agricultural education. Programs are offered to prepare students for teaching agricultural education on the secondary, post-secondary, and adult levels. Graduates also secure employment in other agricultural occupations such as Cooperative Extension, government services, and agribusiness.

Upon completion of the program, students are eligible for certification to teach agricultural education in North Dakota and may be qualified for certification/licensure in a number of other states.

Family and Consumer Sciences Education
The Family and Consumer Sciences Education program at NDSU has been approved by the State Board for Career and Technical Education for the preparation of family and consumer sciences teachers. Thus, graduates are qualified to teach family and consumer sciences classes in vocational or non-vocational school programs at junior and senior high school levels. Graduates also are qualified to teach in adult education programs and to serve as extension home economists. Alternate career opportunities include positions with utility companies, health and human service agencies, and retail establishments.

In addition to fulfilling teacher certification/licensure requirements for North Dakota, graduates may be qualified for certification/licensure in a number of other states.

K-12 Certification/Licensure for Physical Education and Music Education Majors
Certification/licensure for kindergarten through 12th grade programs (K-12) is available for students majoring in Physical Education or Music Education. Students must enroll in CDFS 230 or PSYC 250, Elementary Teaching Methods, and student teach at both the elementary and secondary levels, as well as meet the specific requirements for each major department.

Elementary Education/CDFS Dual Degree Program
Students may concurrently earn a degree in Elementary Education from Valley City State University and a degree in Child Development and Family Science from NDSU while located on the NDSU campus. It allows the student to earn two degrees from two universities in the timeframe it typically takes to earn one baccalaureate degree. See department for details.

Sample ’08-09 Curriculum
Extension Education Minor
The Extension Education minor provides educational background and presentation skills for individuals who seek careers associated with the Cooperative Extension Service. This minor is offered through the Agricultural Education and the Family and Consumer Sciences Education programs.

Requirements            Credits
H&CE 341, Leadership & Presentation Tech               3
H&CE 345, Extension Education               3
H&CE 444, Planning Comm Prog in Ag Ed or
H&CE 468, Fam Life & Adult Educ Pgmts               3
H&CE 445, Technology Transfer in Agri.              3
H&CE 481, Methods/Teaching Agriculture or
H&CE 482, Meth/Teach Fam/Cons Sci or
EDUC 451, Instruc Plan Meth/Asses                   3
H&CE 496, Extension Internship                  6-9

Curriculum Total               20-23

Title II Institutional Report
To comply with the requirements of Section 207 of Title II of the Higher Education Act, NDSU has provided the following information to the North Dakota Education Standards and Practices Board.

Section I. Pass rates
PPST Reading: NDSU Range 184-171, Median 179,
N=97, National Range 187-151, Median 177
PPST Writing: NDSU Range 187-171, Median 173,
N=97, National Range 190-154, Median 175
PPST Mathematics: NDSU Range 186-164, Median 182,
N=97, National Range 190-150, Median 178

Section II. Program information
1. Number of students in the regular teacher preparation program:
   a. Total number of students enrolled during 2006-2007: 184

2. Information about supervised student teaching:
   b. Number of students in programs of supervised student teaching during academic year 2006-2007: 69
   c. Number of supervising faculty who were:
      Appointed full time in professional education: 8
      Appointed part time in professional education, not otherwise employed by the institution: 7

   Total number of supervising faculty for the teacher preparation program during 2006-2007: 15

3. Information about state approval or accreditation of teacher preparation programs:
   f. Is your teacher preparation program currently approved or accredited by the state? Yes
   g. Is your teacher preparation program currently under a designation as "low-performing" by the state (as per section 208(a) of the HEA of 1998)? No

Section III. Contextual information
* The School of Education at NDSU is accredited by the National Council for Accreditation of Teacher Education (NCATE), 1010 Massachusetts Ave NW, Suite 5000, Washington, DC, 20036; (202) 466-7496. This accreditation covers the institution's initial and advanced teacher education, advanced educational leadership, and advanced school counseling programs.

The School Counseling program is accredited by the Council for the Accreditation of Counseling and Related Educational Programs (CACREP), 5999 Stevenson Avenue, Alexandria, VA, 22304; (703) 823-9800.

The initial and advanced Teacher Education, Advanced Educational Leadership, and Advanced School Counseling programs at NDSU are approved/accredited by the North Dakota Education Standards and Practices Board (ESPB), 2718 Gateway Ave., Suite 303, Bismarck, ND, 58503-0585; (701) 328-9641.

The Teacher Education, Educational Leadership, and School Counseling programs at NDSU utilize the “Reasoned Action Model” as the organizing conceptual framework. A copy can be reviewed in room 210, Family Life Center, NDSU campus, 231-7921.

All initial Teacher Education candidates are required to prepare and submit portfolios as part of the assessment process.

For more information, contact Chair, NDSU School of Education, PO Box 5057, Fargo, ND, 58105-5057, 231-7921.
The College of Pharmacy, Nursing, and Allied Sciences at North Dakota State University has provided an education for men and women in pharmacy and the pharmaceutical sciences since 1902. In the fall of 1990, a six-year entry-level Doctor of Pharmacy (Pharm.D.) program was implemented.

The college introduced an associate degree nursing program in 1969, which was discontinued in 1987. In 1986, the college initiated a four-year baccalaureate degree program in nursing.

Baccalaureate degree programs in the allied health fields of clinical laboratory science, respiratory care, and radiologic science joined the college in 2006.

**Degree Programs**

The College of Pharmacy, Nursing, and Allied Sciences offers undergraduate academic programs in pharmacy, nursing, clinical laboratory science, respiratory care and radiologic sciences. Admission requirements, curricula and degree titles differ for the programs.

The Pharmacy curriculum consists of a six-year professional program leading to the Pharm.D. degree. Graduates are qualified to apply for licensure as pharmacists. In addition, a two-year post-baccalaureate Pharm.D. program is available through the college. Graduate programs leading to an M.S. and a Ph.D. in Pharmaceutical Sciences also are available.

The baccalaureate nursing program is a four-year course of study leading to a Bachelor of Science in Nursing (BSN) degree. Graduates are eligible to apply for admission to take the national licensing examination (NCLEX) to become a registered nurse (RN). Graduate programs leading to a Master of Science in Nursing (MS) and a Doctor of Nursing Practice (DNP) also are available.

Four year degree plans in Clinical Laboratory Science (CLS), Respiratory Care (RC) and Radiologic Sciences (RS) include academic course work on campus and an internship in an affiliated, accredited hospital-based clinical program. Twelve-fifteen month internships are required of CLS and RC majors and a 24-month internship is required for RS majors. Graduates are eligible to write national certifying examinations.

**Academic Preparation**

Certain preparation in addition to the minimum core curriculum requirements is advisable if a student is to enter easily and progress smoothly through a particular university curriculum.

All students must complete all required courses with a grade of C or above. All students must maintain a semester GPA of 2.0 or above for each semester in the College. A student who fails to meet this standard for two successive or three non-successive semesters shall be terminated from enrollment in the College of Pharmacy, Nursing and Allied Sciences.

The faculty of the college reserves the right to terminate the registration of any student at any time if, in the opinion of the faculty, the student demonstrates that he or she is unsuited for a professional health career and its inherent responsibilities and obligations. Circumstances that may lead to student termination will include, but not be limited to, academic misconduct, violation of campus, state or federal statutes or regulations.

**Admission**

Selection committees will evaluate applicants for admission to the college professional programs. NDSU course work and transfer credits with grades of D are not accepted for program requirements.

**Pharmacy.** Additional high school preparation for the pharmacy major is recommended. Prospective pharmacy majors should present strong preparation in mathematics, in the physical/biological sciences, and in communication skills.

Evaluations will be based on college records, state residency, Pharmacy College Admission Test (PCAT) scores, and other pertinent information. A personal visit, which includes an interview and test is a part of the evaluation process. A minimum cumulative GPA of 3.00 in college course work is required for evaluation for admission, with completion of all required prerequisite courses by the end of spring term prior to beginning the professional program. (All core pre-pharmacy course work, which is indicated by an asterisk, must be completed by the end of the fall term prior to the January 1 application.)

Actual admission “cut off” is generally much higher. Applications for admission to the professional program must be made by January 1 of the sophomore year in pre-pharmacy for fall semester admission. All applicants will receive notice of their status by April 15.

Applications for admission to the post-baccalaureate Pharm.D. program must be made by December 15. All applicants will receive notice of their status by June 15.

**Nursing.** Applications for admission to the baccalaureate program should be made by May 20 for the class beginning in the spring semester of the sophomore year. Applicants will receive notification of their status by June 30.

**Clinical Laboratory Science.** NDSU maintains affiliation agreements with various schools of clinical laboratory science that provide the necessary 12-month internship. Criteria for admission to the internship are established by each school and generally include academic performance, references, prior work experience, and an interview. Admission to the internship is selective. Applications for the internship are due to the academic director of CLS by September 30, however, application deadlines do vary among affiliated programs.

**Radiologic Sciences.** Students who have completed a minimum of the first two years of course work on campus and meet the GPA requirements established by affiliated programs may be eligible to apply for the 24-month internship. Transfer students must complete a minimum of 20 resident credits at NDSU. Admission into the internship is competitive and based upon academic achievement, references, work experience, and an interview. Applications for the internship are due to the academic director of RS by December 1, however, application deadlines do vary among affiliated programs.

**Respiratory Care.** Students eligible for internship application will have completed the first two years of the RC curriculum by the start of an internship and have a minimum GPA of 2.50. Application deadline is March 1. Admission into the internship is selective and is based upon successful completion of all internship prerequisites (a minimum of 20 resident credits at NDSU for transfer students), GPA, references, interview, and career motivation.
## College of Pharmacy, Nursing, and Allied Sciences

### Clinical Laboratory Science Major
Clinical laboratory scientists use the latest biomedical instruments to perform laboratory tests to determine the presence of disease and aid in patient treatment, monitor quality, evaluate and communicate results, and research and develop new tests and methodologies.

A baccalaureate degree, major in clinical laboratory science, includes three years of academic coursework on campus and a 12-month internship in an accredited school of clinical laboratory science. Graduates are eligible to take a national certification exam offered by a recognized agency.

College academic work includes college algebra, biological sciences, chemistry and statistics, along with general education electives. Courses in molecular biology techniques, virology, management and research methods also are recommended. The full-time internship consists of classroom and clinical “bench instruction” in clinical chemistry, hematology, immunohematology, microscopy/urinalysis, microbiology, serology, phlebotomy, education, management and research methods.

NDSU has affiliation agreements with various schools of clinical laboratory science that provide the professional education or internship. Affiliated programs are accredited by the National Accrediting Agency for Clinical Laboratory Science. Criteria for admission to the year of internship are established by each school and generally include academic performance, references, prior work experience, and an interview. Admission to the internship is selective. Internship application procedures, descriptions of professional courses, and registration information for the year of internship are available from the Department of Allied Sciences. Grades submitted by the clinical institution for each of the courses taken during the professional training are attached to the student's official university transcript, but are not included in calculation of grade-point average.

### Sample ’08-09 Curriculum

#### Clinical Laboratory Science Major

**General Education**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, College Composition I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td></td>
</tr>
<tr>
<td>STAT 330, Intro Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td></td>
</tr>
<tr>
<td>CSCI 114, Microcomputer Pkgs</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 150, 150L, General Biology, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>BIOL 220, 220L, Human Anat/Phys I, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td></td>
</tr>
</tbody>
</table>

**Total**                                    | 41      |

**Major Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLS 111, Intro to Clinical Lab Science</td>
<td>1</td>
</tr>
<tr>
<td>CLS 300, Phlebotomy &amp; Specimen Collection</td>
<td>2</td>
</tr>
<tr>
<td>CLS 435, Hematology</td>
<td>2</td>
</tr>
<tr>
<td>CLS 496, Internship</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 460, Fund of Biochem &amp; Molec Biol I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 221, 221L, Human Anat/Phys II, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>CHEM 121, 121L, General Chem I, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>CHEM 122, 122L, General Chem II, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>MATH 103, College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MICR 350, 350L, General Microbiology</td>
<td>3,1</td>
</tr>
<tr>
<td>MICR 363, Clinical Parasitology</td>
<td>2</td>
</tr>
<tr>
<td>MICR 460, 460L, Pathogenic Microbiology</td>
<td>3,2</td>
</tr>
<tr>
<td>MICR 470, 471, Basic Immunology</td>
<td>3,2</td>
</tr>
<tr>
<td>ZOO 315, 315L, Genetics, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>CHEM 341, 341L, Organic Chem I, Lab &amp; CHEM 342, Organic Chemistry II or BIOL 461, Fund of Biochem &amp; Molec Biol II</td>
<td>3,4</td>
</tr>
</tbody>
</table>

**Total**                                    | 87      |

**Radiologic Sciences Major**

Radiographers perform diagnostic imaging examinations to assist physicians to diagnose or rule out disease or injury. The baccalaureate Radiologic Sciences (RS) program includes two or more years of academic course work on campus and a 24-month professional phase or internship that includes classroom and clinical education specific to radiology. Academic course work includes chemistry, physics, anatomy and physiology, microbiology, trignometry, and computer science, in addition to general education requirements. Each student also completes a minimum of 12 credits of 300-400 level special elective courses on campus related to a specialty area of interest in radiologic sciences. A list of approved special elective courses is available from the RS advisor.

Students who have completed the first two years of course work on campus and meet the GPA requirements may be eligible to apply for an internship. Transfer students must complete a minimum of 20 resident credits at NDSU prior to the start of the internship to be eligible to apply to affiliated programs. Admission into the internship is competitive and based upon academic achievement, references, work experience, and an interview.

The internship provides 60 credits of classroom and clinical instruction in patient-care procedures, radiation physics and protection, principles of imaging, positioning, radiobiology, and pathology. Affiliated radiology programs are accredited by the Joint Review Committee for Education in Radiologic Technology. Upon completion of the internship, graduates are eligible to write the national certifying examination to become a registered radiologic technologist, RT(R).

Registration procedures for the internship are available from the Department of Allied Sciences. Grades submitted for each of the courses taken during the internship are attached to the student’s official university transcript, but are not included in calculation of grade-point average.

---

### Sample '08-09 Curriculum

#### Radiologic Sciences Major

**General Education**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Composition I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total**                                    | 41      |

**Major Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110, College Composition I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGR 101, College Composition I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>MATH 103, College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MICR 350, 350L, General Microbiology</td>
<td>3,1</td>
</tr>
<tr>
<td>MICR 363, Clinical Parasitology</td>
<td>2</td>
</tr>
<tr>
<td>MICR 460, 460L, Pathogenic Microbiology</td>
<td>3,2</td>
</tr>
<tr>
<td>MICR 470, 471, Basic Immunology</td>
<td>3,2</td>
</tr>
<tr>
<td>ZOO 315, 315L, Genetics, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>CHEM 341, 341L, Organic Chemistry I</td>
<td>3,4</td>
</tr>
</tbody>
</table>

**Total**                                    | 87      |

**Sample '08-09 Curriculum**

#### Radiologic Sciences Major

**General Education**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, College Composition I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total**                                    | 41      |

**Major Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110, College Composition I, II</td>
<td>3,3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>MATH 103, College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MICR 350, 350L, General Microbiology</td>
<td>3,1</td>
</tr>
<tr>
<td>MICR 363, Clinical Parasitology</td>
<td>2</td>
</tr>
<tr>
<td>MICR 460, 460L, Pathogenic Microbiology</td>
<td>3,2</td>
</tr>
<tr>
<td>MICR 470, 471, Basic Immunology</td>
<td>3,2</td>
</tr>
<tr>
<td>ZOO 315, 315L, Genetics, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>CHEM 341, 341L, Organic Chemistry I</td>
<td>3,4</td>
</tr>
</tbody>
</table>

**Total**                                    | 87      |

---

### Note:
This is a sample curriculum. Other variations are possible. Students should meet with their RS advisor to plan schedules.

### Respiratory Care Major
Respiratory Care (RC) is an allied health profession that involves the evaluation, treatment, and education of patients with cardiopulmonary disorders. Respiratory therapists (RTs) work closely with physicians, nurses, and other allied health members in critical care, emergency rooms, nursery and pediatrics, medical units, and home care. RTs perform diagnostic tests, administer a variety of treatments to promote pulmonary hygiene, manage mechanical ventilators and cardiovascular support, and direct pulmonary rehabilitation activities.

The baccalaureate degree Respiratory Care program includes two-three years of academic course work at NDSU and a 15-month professional phase or internship in the Respiratory Care Department at MeritCare Medical Center, Fargo, N.D.
Sample '08-09 Curriculum
Respiratory Care Major

General Education

Credits
First Year Experience (F):.................1
UNIV 189, Skills for Academic Success ........1
Communications (C):.....................3
COMM 110, Fund of Public Speaking ..........3
ENGL 110, 120, College Composition I, II .....3
ENGL Upper Level Writing Course........2
Quantitative Reasoning (R):...............3
STAT 330, Intro to Statistics .................3
Science & Technology (S):.................6
CSCI 114, Microcomputer Pkgs ............3
BIOL 220, 220L, Human Anat/Phys I, Lab .....3
MICR 202, 202L, Intro Micro, Lab ............3
Humanities & Fine Arts (A) ...............6
Social & Behavioral Sciences (B) .........6
Including: PSYC 111, Intro to Psychology
Wellness (W),..............................2
Cultural Diversity (D)........................2
Global Perspective (G)....................6
Total .......................................40

Major Requirements

Credits
RC 111, Intro to Respiratory Care ............1
RC 496, Intership*..........................51
RC 494, Individual Study ...................4
CHEM 121, 121L, Prin of Chem I, Lab ......3
CHEM 122, 122L, Prin of Chem II, Lab ....3
CHEM 240, Survey of Organic Chem .........3
CHEM 260, Elem of Biochemistry ..........4
HNES 210, First Aid & CPR ................2
MATH 103, College Algebra .................3
PHRM 125, Med Term for the Health Prof ...1
PHYS 120, Fundamentals of Physics .......3
Special Electives*...........................12
Total .......................................96

Department of Nursing

www.ndsu.edu/nds/nursing

Nursing Major

The Nursing program is a four-year course of study leading to a Bachelor of Science in Nursing (B.S.N.) degree. Upon successful completion of the program, the graduate is eligible to apply for licensure as a registered nurse (R.N.). The nursing program is approved by the North Dakota Board of Nursing and is nationally accredited by the Commission on Collegiate Nursing Education (CCNE).

Mission

The mission of the nursing department is to provide professional nursing education, to advance knowledge of the discipline, and to serve as a resource for the health care needs of society.

Core Values

The faculty, students, and graduates of the department of nursing believe in the inherent worth and dignity of individuals and the value of professional nursing as an integral part of the health of society. We believe the core values of autonomy, caring, integrity, justice, professionalism and respect guide the scholarship of education, service, practice and research.

The role of faculty is to encourage, facilitate, and provide opportunities which support self-directed learning and critical thinking, enhance personal growth and socialize students as members of the profession. The role of students is to develop the knowledge, skills and attitudes essential to professional nursing practice and graduate study in nursing. The role of the graduates is to promote the health of society, advance the discipline, and function as responsible citizens of the nation and the world.

Nursing is an art and science. It is a practice profession and an academic discipline. The domain of nursing is the human response to actual or potential variations in human functioning and life processes. Nursing involves interactions among the nurse, the person and the environment in the prevention of disease, the promotion and restoration of health, and the comfort of the dying.

Professional nursing practice is the creative application of therapeutic nursing interventions based on a synthesis of scientific knowledge, research, professional values and standards. Professional nurses work with individuals, families, communities and other aggregates to meet primary, secondary, and tertiary health care needs. Nurses practice independently, interdependently, and collaboratively in a variety of settings. Nurses balance career advancement, personal well-being, and fidelity to nursing's social contract.

Core values provide a framework that supports education for and practice of professional nursing as envisioned by the Department of Nursing.

Caring is the central concept of nursing. The competence, sensitivity and compassion that characterize professional nursing guide our behavior in faculty/student and nurse/client interactions. Respect is reflected by nurses’ regard for human dignity and in our acceptance of the diversity of humankind. In our practice we demonstrate our respect for other disciplines through collegiality and collaboration.

Autonomy reflects a patient’s right to make decisions about his/her health care and nurses’ rights to make decisions about their professional practice. Integrity is manifested in our honesty with patients and the public, by adherence to standards of academic honesty, through our accountability for our actions, and through our provision of care based on practice standards.

The professional obligation to assure equal treatment and equal access to care is a facet of justice. Nurses have a professional responsibility to encourage legislation and policy development that advances nursing care and quality health care for all people. Nursing faculty has an obligation to ensure that students have the opportunity to participate in and contribute to an excellent learning environment. Professionalism encompasses a commitment to lifelong learning and professional development, participation in professional organizations and the political process, and adherence to professional values and regulations.

Graduate Outcomes

The graduate of the North Dakota State University baccalaureate nursing program will:

1. Practice nursing in accordance with American Nurses Association Standards of Practice and Standards of Professional Performance.
2. Apply in nursing practice an understanding of the basic relationships among disease transmission, health status, health policy, cultural influences and health care economics within the global community.
3. Apply quality improvement approaches in work as peers on multidisciplinary teams.
4. Use information technology and communicate effectively with clients, health care team members, policy makers and the public.

Curriculum

The curriculum is organized according to a conceptual model that flows from the mission and values of the nursing program. The "Essentials of Baccalaureate Education" (American Association of Colleges of Nursing, 1998) and "The Standards of Nursing Practice" (American Nurses Association, 2004) served as guidelines for development of the curriculum. The content of the program increases in scope and complexity as the student progresses through the major.

Application Procedures

1. The pre-nursing program (first two semesters) is open to all high school graduates who wish to pursue a nursing major. To enter the pre-nursing program, students must be admitted to the university. The nursing major begins the fall semester of the sophomore year.
2. For admission into the professional nursing program, an application must be submitted by May 20 to the Nursing Office, 136 Sudro Hall. Enrollment in the nursing major is limited. A minimum GPA of 3.0 (4.0 = A) is required in all post high school work.
Admission is competitive and based on all of the following: (a) cumulative GPA of at least 3.0, (b) selective GPA of at least 3.0 that incorporates selected prerequisite courses (see recommended curriculum), (c) completion of prerequisite courses with a passing grade, (d) eligibility for sophomore standing, (e) 2 references, (f) an interview or essay, (g) number of credits (up to 27) taken in the North Dakota University System, and (h) advisor recommendation.

Students applying for a nursing major must submit the following:
1. Application to the professional major
2. Official transcripts from all colleges attended, excluding NDSU
3. Three reference forms
4. Evidence of pre-nursing status at NDSU
5. Completion of institutional GPA of 2.0 or higher in the first two years

The documents must be on file in the Nursing Office by May 20. Application forms may be obtained at the Nursing Office, 136 Sudro Hall, North Dakota State University, Fargo ND 58105. You may also call the Office of Admission at 231-8643 or 1-800-488-NDSU (6378). Students will be notified of their admission status by June 30. Students enrolled at NDSU in the pre-nursing program should consult with their nursing faculty advisor prior to the application deadline.

For further information contact:
Department of Nursing
136 Sudro Hall
North Dakota State University
Fargo, ND 58105
Telephone (701)231-7395

Sample '08-'09 Curriculum

Nursing Major

General Education Requirements Credits
First Year Experience (F):
UNIV 189, Skills for Academic Success ............ 1
Communications (C):
COMM 110, Fund of Public Speaking ............ 3
ENGL 101, 120, College Comp I, II ............ 3,3
ENGL Upper Level Writing Course* ............ 3
Quantitative Reasoning (R): STAT 330, Intro Statistics ............ 3
Science & Technology (S):
CHEM 117, 117L, Chem Con/Appl, Lab ............ 3,1
BIOL 220, 220L, Hum Anat/Phys I, Lab ............ 3,1
MICR 202, 202L, Intro Micro, Lab ............ 2,1
Humanities & Fine Arts (A) ............ 6
Social & Behavioral Sciences (B):
PSYC 111, Intro to Psychology .......... 3
SOC 110, Intro to Sociology or ANTH 111, Intro to Anthropology .......... 3
Wellness (W) ............ 2
Cultural Diversity (D) ............ 2
Global Perspective (G) ............ 3
ANTH 111, Intro to Anthropology ............ 3
Total ............ 41

Additional Requirements Credits
BIOL 221, 221L, Human Anat/Phys II, Lab ............ 3,1
CHEM 260, Elements of Biochemistry ............ 4
HNES 250, Nutrition Science ............ 3
PSYC 250, Developmental Psychology or CDFS 230, Life Span Development ............ 3,6
Electives ............ 6
Total ............ 20

Professional Nursing Requirements* Credits
NURS 240, Nursing as a Scholar Profession ............ 3
NURS 250, Health Promotion ............ 2
NURS 251, Skills & Concepts for Nurs Pract ............ 2
NURS 252, Gerontology Nursing ............ 2
NURS 360, Health Assessment ............ 4
NURS 340, Leadership & Ethical Reflection ............ 2
NURS 341, Found of Clinical Nursing ............ 3
NURS 342, Adult Health I ............ 5
NURS 352, Family Health I ............ 5
NURS 362, Family Health II ............ 4
NURS 430, Nursing Management ............ 2
NURS 402, Mental Health Nursing ............ 5
NURS 403, Adult Health II ............ 5
NURS 404, Adult Health III ............ 4
NURS 406, Public Health Nursing ............ 4
NURS 440, Nursing Issues & Career Dev ............ 2
NURS 450, Nursing Synthesis & Practicum ............ 4
PHRM 300, Prin of Clinical Pharmacology ............ 3
Total ............ 61

Curriculum Total (min) ..................... 122
1 Effective fall 2007: students with composite ACT scores of 21 or higher should register for ENGL 120 (see transfer credit for ENGL 120 not received: students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade). Students with a composite ACT score of less than 21 are required to register for English 110.
2 Refer to department or curriculum guide for course options.
3 May double count with Select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Grad Courses.
4 Must be accepted into nursing program to enroll in nursing courses.
5 Must be accepted into nursing program to enroll in nursing courses.

Selected prerequisite courses: the following courses must be completed prior to applying to the professional nursing major. The selected GPA is calculated on these courses.
COMM 110, Fundamentals of Public Speaking
ENGL 120, College Composition II
PSYC 111, Intro to Psychology
ENGL Upper Level Writing Course

Completion of 11 credits (of the 19 credits required) in the science category:
BIOL 220 & 220L, Hum Anat/Phys I & Lab
BIOL 221 & 221L, Hum Anat/Phys II & Lab
CHEM 117 & 117L, Chem Concepts & Applications & Lab
CHEM 260, Elements of Biochemistry
MICR 202 & 202L, Intro to Microbiol & Lab or MICR 202 & 202L, Intro to Microbiol & Lab

Students must successfully complete all first and second year courses prior to entering the third year of the nursing curriculum.

Computer proficiency is expected before beginning the nursing program.

Students must meet the university's general education requirements as well as the curriculum requirements in effect at the time of enrollment into the program. Students should consult their faculty advisor about electives that may enhance their program of study. Because of limitations on class size, the typical student admitted to the nursing program has a selective GPA higher than 3.0.

Disclaimer: The recommended curriculum is subject to change based on nursing program development/planning. Students must consult with their nursing advisor to keep updated with the current curriculum.
### P1 - Fall
- **BIOC 460, Biochemistry I** 4
- **MICR 470, Basic Immunology** 3
- **PSCI 340, Pathophysiology I** 3
- **PSCI 368, Pharmacuetics I** 4
- **PHRM 351, 351L, Pharmaceutical Care I, Lab** 1,1

**Total:** 17

### Fall/Spring Total: 33

### P2 - Fall
- **PSCI 412, Pharmacodynamics II** 3
- **PSCI 413, Pharmacodynamics III** 3
- **PSCI 470, Pharmacuetics III** 4
- **PHRM 451, 451L, Pharmaceutical Care II, IPPE** 1,1
- **PHRM 480, Drug Lit. Evaluation** 3
- **PHRM 475, Pharmacy Management** 3

**Total:** 17

### P2 - Spring
- **MICR 460/561, Pathogenic/Pharm Lab** 3,1
- **PSCI 414, Pharmacodynamics IV** 3
- **PSCI 415, Pharmacodynamics V** 3
- **PSCI 416, Pharmacodynamics VI** 3
- **PHRM 452, 452L, Pharmaceutical Care, Lab** 1,1
- **PHRM 471, Clinical Pharmacokinetics** 2

**Total:** 17

### Fall/Spring Total: 34

---

### Additional Requirements
- **BIOL 220, Human Anat/Phys I, Lab** 4
- **CHEM 341, Organic Chemistry I, Lab** 4
- **CHEM 342, Organic Chemistry II** 3
- **MATH 147, Applied Calculus II** 4
- **MICR 202, 202L, Intro to Microbiology, Lab** 2,1
- **PHYS 120, Fundamentals of Physics** 3

**Total:** 25

### Notes:
- Students attending other institutions must be aware of the General Education requirements when enrolling in course work.
- This curriculum is subject to periodic changes.
- Students should maintain frequent contact with the college to determine appropriate course work.

### P3 - Spring
- **PHRM 520, Pediatrics/Geriatics** 2
- **PHRM 535, Neoplastic Diseases** 2
- **PHRM 536, Neurology/Psychiatry** 3
- **PHRM 537, Renal/Fuid & Electrolyte** 3
- **PHRM 551, 551L, Pharmaceutical Care, Lab** 1,1
- **Professional Elective** 1,3

**Total:** 16-17

### Fall/Spring Total: 31

### P4 - Fall/Spring
- **PHRM 534, Rheum/Endo/Repro** 2
- **PHRM 532, Infectious Disease** 3
- **PHRM 538, Cardiovascular & Pulmonary** 4
- **PHRM 552, 552L, Pharmaceutical Care, Lab** 1,1
- **PHRM 558, GI/Nutrition** 2
- **PHRM 572, Pharmacy Law** 2
- **Professional Elective** 1,3

**Total:** 16-17

### Fall/Spring Total: 45

---

**Curriculum Total:** 143
Opportunities in the college reflect the belief that an understanding of the methods and findings of science is best achieved through first-hand experience in the process of conducting, analyzing, and reporting research. Students are encouraged to participate in this process by working closely with faculty and other students in laboratory and field research, thus gaining direct knowledge of the power, limits, and problems in scientific inquiry. These opportunities for direct experience with the tools of the scientist are liberally available to the interested and motivated student.

Departments of the College of Science and Mathematics include the following:

- Biological Sciences
- Chemistry and Molecular Biology
- Coatings and Polymeric Materials
- Computer Science
- Geosciences
- Mathematics
- Physics
- Psychology
- Statistics

Degree Programs

The College of Science and Mathematics provides undergraduate programs leading to a Bachelor of Science or Bachelor of Arts degree. Graduate programs at the master's and doctoral levels are also offered. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

Degree Requirements

All majors are required to complete departmental and general education requirements. Available majors include the following:

- Behavioral Statistics
- Biochemistry and Molecular Biology
- Biological Sciences
- Biotechnology
- Botany
- Chemistry
- Computer Science
- Geology
- Mathematics
- Natural Resources Management
- Physics
- Psychology
- Statistics
- Zoology

Minors are available in most departments.

Courses to fulfill the major requirements in the college may not be taken pass/fail. Only elective courses outside the major may be taken pass/fail.

Course work transferring from another institution with a grade of D will count toward total number of credits, but not toward specific degree requirements.

Math 101 and 102 are developmental courses and will not count toward credits for graduation in any program.

General Education

College general education requirements for the two undergraduate degrees extend beyond the minimum university general education requirements. The college requires an additional six credits in humanities and/or social sciences for the Bachelor of Science degree and an additional 12 credits for the Bachelor of Arts degree. This requirement may be fulfilled by any course having the following prefix: ADHM, ANTH, ARCH, ART, CFDS, CJ, CLAS, COMM, ECON, ENGL, FREN, GEOG, GERM, HIST, HUM, LA, LANG, MUSC, PHIL, POLS, PSYC, RELS, SOC, SPAN, THEA, WS, or any course from the approved list of general education courses in humanities and social sciences (general education categories A and B). These credits must come from outside the department of the student’s major. An advisor should be consulted for specific courses. Students also are encouraged to follow their own interests in choosing electives that go beyond the minimum requirements. Basic requirements for each degree include the following:

Bachelor of Science Degree

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Composition I, II</td>
<td>6</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course1</td>
<td>3</td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts1</td>
<td>6</td>
</tr>
<tr>
<td>(additional college requirement)1</td>
<td>6</td>
</tr>
<tr>
<td>Quantitative Reasoning1</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology1</td>
<td>10</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences1</td>
<td>6</td>
</tr>
<tr>
<td>Wellness1</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspectives</td>
<td>2</td>
</tr>
</tbody>
</table>

1 Refer to www.ndsu.edu/registrar for courses approved for General Education.

Bachelor of Arts Degree

B.A. degree requirements are the same as the B.S. degree with an additional six credits of humanities or social and behavioral sciences and the addition of two years of a modern foreign language. This means completion of the second year of college-level language or the equivalent. For example, students with two or three years of a foreign language in high school should enter second-year college-level language. Students with four or more years of a foreign language in high school will be considered to have completed this requirement.

All degree candidates must apply for graduation through the Office of Registration and Records according to university procedures and deadlines.

Specializations

Specializations are provided for career preparation in a range of areas.

Pre-Professional Programs

Pre-professional curricula are offered by a number of departments for students interested in preparing for careers in medicine, dentistry, mortuary science, chiropractic, optometry, osteopathy, and other health-related fields. Most pre-professional programs are flexible and can be developed around many different majors. Departments that have expressed a special interest in advising pre-professional majors include biological sciences, chemistry and molecular biology, physics and psychology.

In addition to the preceding, a number of departments have developed other specializations to meet today’s rapidly changing job markets. These may be found in the individual department sections as follows:

**Biological Sciences:** environmental science, biotechnology, biological sciences education, comprehensive science education, wildlife and fisheries biology, and cell biology/physiology

**Chemistry:** biochemistry, biotechnology, chemistry education, pre-professional chemistry, coatings and polymeric materials

**Geosciences:** geochemistry

**Psychology:** natural science track, social sciences track, options in behavioral neuroscience, industrial-organizational, human services, and experimental

**Teacher Certification**

Several of the majors available through the College of Science and Mathematics lead to careers in teaching.
Students may complete the requirements for a major in the college, then apply for admission to the School of Education in the College of Human Development and Education to undertake the additional requirements necessary to qualify for teacher certification. Alternatively, students may initially select a science and mathematics education curriculum offered through the School of Education.

Programs leading to teacher certification are available in the following areas: biological sciences, chemistry, comprehensive science, earth science, mathematics, and physics.

Students interested in teacher education are encouraged to declare a double major in their discipline and in education (i.e., chemistry education and chemistry). Such double majors may typically be earned by successful completion of a few additional credits. Students should contact their advisors for details, and are encouraged to declare their primary and secondary majors with the Office of Registration and Records, 110 Ceres.

Pre-Medicine and Pre-Dentistry

The suggested program will meet the requirements of most medical and dental schools. In general, these requirements include organic chemistry, physics, and the equivalent of a year of general biology. Some college-level mathematics, such as MATH 146-147, is strongly recommended. The Bachelor of Arts degree program is recommended. Contact the Department of Biological Sciences for additional information (231-7087).

Pre-Medicine and Pre-Dentistry Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English &amp; Speech Communication</td>
<td>9</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>12</td>
</tr>
<tr>
<td>Humanities &amp; Social Sciences</td>
<td>28</td>
</tr>
<tr>
<td>Major</td>
<td>30</td>
</tr>
<tr>
<td>Sciences &amp; Mathematics</td>
<td>32</td>
</tr>
<tr>
<td>Skills for Academic Success</td>
<td>2</td>
</tr>
<tr>
<td>Wellness</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
</tr>
</tbody>
</table>

* Approximate number of credits in this subject area.

Interdisciplinary Programs

The College of Science and Mathematics participates in the following undergraduate interdisciplinary programs. For further information, refer to the Interdisciplinary Programs section of the Bulletin.

Biotechnology Major

www.ag.ndsu.nodak.edu/plantsci

Biotechnology is an interdisciplinary field based on a combination of biology and technology. It includes the application of science and technology to the design of new plants, animals, and microorganisms that have improved characteristics.

Natural Resources Management Major

www.ag.ndsu.nodak.edu/urm

This interdisciplinary program is available through the College of Science and Mathematics’ Biological Sciences and Geosciences departments and the College of Agriculture, Food Systems and Natural Resources’ School of Natural Resources.

Cooperative Education

Cooperative Education, a program of the Career Center, offers undergraduate and graduate students an opportunity to integrate classroom study with paid, career-related work experience for academic credit. Work may be full or part time. Credit is granted through Continuing Education and awarded directly by the Cooperative Education program. A Cooperative Education experience may substantially improve students’ employment opportunities after graduation. Students may obtain one or two semesters of professional work experience related to their studies; however, no more than a total of three credits may be applied to the minimum of 122 credits required for the degree. Each department has specific requirements for earning these credits. The student must have approval from the department chair prior to beginning the Cooperative Education program.

Department of Biological Sciences

http://biology.ndsu.nodak.edu

The Department of Biological Sciences offers broad undergraduate preparation in the basic concepts and principles of the life sciences with major emphasis on both plant and animal forms. Various curricular options are available for specific career interests. It is important for students to consult frequently with their advisors regarding the proper options and courses related to their special interests. In addition, students should correspond with their advisors to make sure they satisfy specific requirements.

Curricula for secondary school biological sciences education, comprehensive science education, environmental studies, traditional course sequences, and pre-professional programs are available in the department. Graduate work in biology is offered at the Master of Science level.

Curriculum for students interested in a specific biological science (animal science, botany, entomology, horticulture, microbiology, plant pathology, or zoology) should consult the appropriate discipline.

Environmental Science Option

For students interested in careers that address solving environmental problems, there is the Biological Sciences major with an Environmental option. This rigorous option incorporates biological sciences and environmental studies, traditional course sequences, and pre-professional programs available in the department. Students interested in this option should visit with their advisors to obtain the specific requirements.

Sample '08-09 Curriculum

Biological Sciences Major

General Education Requirements

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits</td>
<td>First Year Experience (F):</td>
</tr>
<tr>
<td>189</td>
<td>UNIT 189, Skills for Academic Success</td>
</tr>
<tr>
<td>1</td>
<td>Communications (C):</td>
</tr>
<tr>
<td>110</td>
<td>COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>120</td>
<td>ENGL 120, Composition</td>
</tr>
<tr>
<td>1</td>
<td>ENGL 324, Writing in the Sciences</td>
</tr>
<tr>
<td>3</td>
<td>Quantitative Reasoning (Q):</td>
</tr>
<tr>
<td>3</td>
<td>STAT 330, Intro Stats</td>
</tr>
<tr>
<td>3</td>
<td>Science &amp; Technology (S):</td>
</tr>
<tr>
<td>1</td>
<td>BIOL 150, General Biology I, Lab</td>
</tr>
<tr>
<td>1</td>
<td>BIOL 151, General Biology II, Lab</td>
</tr>
<tr>
<td>3</td>
<td>CHEM 121, General Chemistry I, Lab</td>
</tr>
<tr>
<td>3</td>
<td>Humanities &amp; Fine Arts (A):</td>
</tr>
<tr>
<td>6</td>
<td>Social &amp; Behavioral Sciences (B):</td>
</tr>
<tr>
<td>6</td>
<td>Wellness (W):</td>
</tr>
<tr>
<td>2</td>
<td>Cultural Diversity (D):</td>
</tr>
<tr>
<td>2</td>
<td>Global Perspective (G):</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>HUM/SOC SCI Electives (B.S. Degree)</td>
</tr>
<tr>
<td>6</td>
<td>HUM/SOC SCI Electives (B.A. Degree)</td>
</tr>
<tr>
<td>12</td>
<td>Second Year Lang Proficiency (B.A. Degree)</td>
</tr>
<tr>
<td>Total</td>
<td>6-12</td>
</tr>
</tbody>
</table>

Major/Related Requirements

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>BIOL 364, General Ecology</td>
</tr>
<tr>
<td>3</td>
<td>BIOL 459, Evolution</td>
</tr>
<tr>
<td>2</td>
<td>BIOL 491, Seminar (Capstone)</td>
</tr>
<tr>
<td>3</td>
<td>BOT/ZOO 315, Genetics, Lab</td>
</tr>
<tr>
<td>3</td>
<td>BOT 372, Structure &amp; Diversity of Plants &amp; Fungi</td>
</tr>
<tr>
<td>3</td>
<td>CHEM 122, General Chemistry I, Lab</td>
</tr>
<tr>
<td>3</td>
<td>CHEM 240, Survey of Organic Chemistry</td>
</tr>
<tr>
<td>3</td>
<td>CHEM 260, Elements of Biochemistry</td>
</tr>
<tr>
<td>3</td>
<td>CHEM 341, Introduction to Biochemistry, Lab</td>
</tr>
<tr>
<td>3</td>
<td>CHEM 342, Organic Chemistry II</td>
</tr>
<tr>
<td>4</td>
<td>BIOC 460, Fundamentals of Biochemistry</td>
</tr>
<tr>
<td>3</td>
<td>MATH 146, Calculus I</td>
</tr>
<tr>
<td>3</td>
<td>PHYS 211, Calculus II, Lab</td>
</tr>
<tr>
<td>3</td>
<td>PHYS 212, Calculus II, Lab</td>
</tr>
<tr>
<td>4</td>
<td>CSI Elective</td>
</tr>
<tr>
<td>Total</td>
<td>41-45</td>
</tr>
</tbody>
</table>

Additional Requirements

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>GEOL 307, Cell Biology</td>
</tr>
<tr>
<td>12</td>
<td>Subdiscipline Electives</td>
</tr>
<tr>
<td>7</td>
<td>Earth Science Electives</td>
</tr>
<tr>
<td>2</td>
<td>Free Electives (for degree completion)</td>
</tr>
<tr>
<td>Total</td>
<td>22-34</td>
</tr>
</tbody>
</table>

Environmental Science Option

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>GEOL 105, Physical Geology, Lab</td>
</tr>
<tr>
<td>1</td>
<td>GEOL 106, Introductory Geology</td>
</tr>
<tr>
<td>2</td>
<td>SOIL 217, Meteorology &amp; Climatology</td>
</tr>
<tr>
<td>2</td>
<td>SOIL 410, Soil &amp; Environment</td>
</tr>
<tr>
<td>3</td>
<td>CHEM 431, Analytical Chemistry I, Lab</td>
</tr>
<tr>
<td>3</td>
<td>GEOL 428, Geochronology</td>
</tr>
<tr>
<td>4</td>
<td>MATH 147, Calculus II</td>
</tr>
<tr>
<td>3</td>
<td>Physiology Elective</td>
</tr>
<tr>
<td>3</td>
<td>Structural Biology Elective</td>
</tr>
<tr>
<td>Total</td>
<td>38-42</td>
</tr>
</tbody>
</table>

Curriculum Total (min.)

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Curriculum Total</th>
<th>122</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>Effective fall 2007</td>
<td>122</td>
</tr>
<tr>
<td>120</td>
<td>Students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received)</td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>Students who complete English 120 with a C or higher will receive credit for English 110 with transfer credit</td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>Students with a composite ACT score of less than 21 are required to register for English 110</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>May double count with select Humanities &amp; Fine Arts, Social &amp; Behavioral Science, and/or Science &amp; Tech Gen Ed courses</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Refer to department or curriculum guide for course awards</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Also counts as a Global Perspective (G) for general education</td>
<td></td>
</tr>
</tbody>
</table>

Sample '08-09 Curriculum

Biological Sciences Minor

Requirements

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>BIOL 150, General Biology I, Lab</td>
</tr>
<tr>
<td>3</td>
<td>BIOL 151, General Biology II, Lab</td>
</tr>
<tr>
<td>4</td>
<td>BOT 372, Structure &amp; Diversity/Plants &amp; Fungi</td>
</tr>
<tr>
<td>6</td>
<td>Electives</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
</tr>
</tbody>
</table>

Curriculum Total

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Curriculum Total</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Refer to department or curriculum guide for course awards</td>
<td></td>
</tr>
</tbody>
</table>

Biological Sciences Education and Comprehensive Science Education Majors

To meet requirements of the “No Child Left Behind” Act of 2001, students interested in Biological Sciences Education or Comprehensive Science Education are encouraged to declare a double major in the discipline and in education (i.e., Biological Sciences Education and Biological Sciences). Such double majors may typically be earned by successful completion of a few additional credits. Students should contact their advisors or the Office of Registration and Records for details, and are encouraged to declare their primary and secondary majors.
Sample '08-09 Curriculum

Biology and Biotechnology Major

General Education Credits
First Year Experience (F):
UNIV 189, Skills for Academic Success...
Communications (C):
COMM 110, Fund of Public Speaking...
ENGL 110(3), 120, College Comp I, II...
ENGL 324, Writing in the Sciences...
Quantitative Reasoning (Q):
MATH 146, Applied Calculus I...
Science & Technology (S):
BIOL 150, 150L, Gen Biology I, Lab...
BIOL 151, 151L, Gen Biology II, Lab...
CHEM 121, Gen Chem I...
Humanities & Fine Arts (A)...
Social & Behavioral Sciences (B)...
Wellness (W)...
Cultural Diversity (D)...
Global Perspective (G)...

Total: 41

Major Requirements Credits
BIOL 124, 124L, Environ. Biology, Lab...
BIOL 220, 220L, Human Anat & Phys I, Lab...
BIOL 221, 221L, Human Anat & Phys II, Lab...
BIOL 364, General Ecology...
BIOL 459, Evolution...
BIOL 491, Seminar (Capstone)...
BOT/ZOO 315, 315L, Genetics, Lab...
BOT 300-400 Elective...
CHEM 121L, Gen Chem I Lab...
CHEM 122L, Gen Chem II, Lab...
CHEM 250, Survey of Organic Chem...
CHEM 260, Elements of Biochem...
CHEM 405, 405L, Organic Chem I, Lab...
CHEM 432, 432L, Organic Chem II, Lab...
CSCI Elective...

Total: 67

Professional Education Requirements Credits
EDUC 321, Intro to Teaching...
EDUC 322, Educational Psychology...
EDUC 381, Early Experience...
EDUC 451, Instruc, Planning, Meth & Assess...
EDUC 481, Classrm Pra/Method of Teach I-Sci...
EDUC 485, Student Teach Seminar...
EDUC 486, Classrm Mgt of Diverse Learners...
EDUC 487, Student Teaching...
EDUC 488, Applied Student Teaching...
EDUC 489, Nat American/Multicult Inst Pra...

Total: 31

Curriculum Total: 139

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for ENGL 120 (unless transfer credit for ENGL 120 is received).
2 Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade. Students with a composite ACT score of less than 21 are required to register for English 110.
3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech Gen Ed courses.

Sample '08-09 Curriculum

Botany Major

General Education Requirements Credits
First Year Experience (F):
UNIV 189, Skills for Academic Success...
Communications (C):
COMM 110, Fund of Public Speaking...
ENGL 110(3), 120, College Comp I, II...
ENGL 324, Writing in the Sciences...
Quantitative Reasoning (Q):

Total: 122

College of Science and Mathematics

Curriculum Total: 117

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for ENGL 120 (unless transfer credit for ENGL 120 is received).
2 Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade. Students with a composite ACT score of less than 21 are required to register for English 110.
3 May double count with select Humanities & Fine Arts, Social & Behavioral Science, and/or Science & Tech Gen Ed courses.

4 Refer to department or curriculum guide for course options.
### Sample '08-09 Curriculum

#### Botany Minor

**Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150, 150L, Gen Biology I, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BIOL 151, 151L, Gen Biology II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BOT 315, 315L, Genetics, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BOT 372, Struct &amp; Diversity/Plants &amp; Fungi</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Curriculum Total** ........................................ 19

1 Refer to department or curriculum guide for course options.

### Zoology Major

Minimum requirements for the Zoology major include 42 credits of biological sciences, of which 14 are “core” credits in zoology and biology. An additional 21 to 26 credits fulfill one of three options including courses in chemistry, physics, mathematics, and statistics. The 42 credits for the major are completed with elective zoology courses. College and university general education requirements constitute the remainder of the curriculum.

Zoology major “core” course requirements include the following:

- BIOL 150-150L, General Biology I, Lab
- BIOL 151-151L, General Biology II, Lab
- ZOO 315-315L, Genetics, Lab
- ZOO 491, Seminar

Students may pursue their personal and career interests through one of the following options in zoology:

#### Option 1: General Zoology

This option includes more elective choices than the other options and is designed for students who wish to pursue an area not represented in the other two options.

**Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150, 150L, General Biology I, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BIOL 151, 151L, General Biology II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>CHEM 122, 122L, Gen Chem II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>CHEM 240, Survey of Organic Chem</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CHEM 341, 341L, Organic Chem I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CHEM 342, Writing in the Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3,3</td>
<td></td>
</tr>
<tr>
<td>ENGL 324, Intro to Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>HUM 121-121L, Gen Hum I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>HUM 121-121L, Gen Hum I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>3-4</td>
<td></td>
</tr>
</tbody>
</table>

**Curriculum Total** ........................................ 42

#### Option 2: Physiology, Cell Biology, or Health Sciences

This option is designed for students who are interested in physiology or cell and molecular biology or who plan to enter professional schools (medical, dental, optometry, chiropractic) or graduate programs in physiology and cell biology. The emphasis is on additional course work in cell biology, physiology, chemistry, and physics.

**Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150, 150L, Gen Biology I, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BIOL 151, 151L, Gen Biology II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>CHEM 122, 122L, Gen Chem II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>CHEM 240, Survey of Organic Chem</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CHEM 341, 341L, Organic Chem I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CHEM 342, Writing in the Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3,3</td>
<td></td>
</tr>
<tr>
<td>ENGL 324, Intro to Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>HUM 121-121L, Gen Hum I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>HUM 121-121L, Gen Hum I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>3-4</td>
<td></td>
</tr>
</tbody>
</table>

**Curriculum Total** ........................................ 42

**Additional Requirements**

Free Electives (for degree completion) ........... 7-24

**Total** ....................................................... 7-24

#### Option 3: Fisheries, Wildlife, Ecology, and Behavior

**Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150, 150L, Gen Biology I, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BIOL 151, 151L, Gen Biology II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BOT 315, 315L, Genetics, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ZOO 491, Seminar</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Curriculum Total** ........................................ 37-41

#### Sample '08-09 Curriculum

##### Zoology Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150, 150L, General Biology I, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BIOL 151, 151L, General Biology II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>CHEM 122, 122L, Gen Chem II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>CHEM 240, Survey of Organic Chem</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CHEM 341, 341L, Organic Chem I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CHEM 342, Writing in the Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3,3</td>
<td></td>
</tr>
<tr>
<td>ENGL 324, Intro to Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>HUM 121-121L, Gen Hum I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>HUM 121-121L, Gen Hum I, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>6-12</td>
<td></td>
</tr>
</tbody>
</table>

**Curriculum Total** ........................................ 6-12

**Additional Requirements**

Free Electives (for degree completion) ........... 7-24

**Total** ....................................................... 7-24

#### Sample '08-09 Curriculum

##### Zoology Minor

**Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 150, 150L, Gen Biology I, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BIOL 151, 151L, Gen Biology II, Lab</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>BOT 315, 315L, Genetics, Lab</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ZOO 491, Seminar</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Curriculum Total** ........................................ 18

1 Refer to department or curriculum guide for course options.

---

### Department of Chemistry and Molecular Biology

**www.ndsu.edu/chemistry**

The department offers both B.S. and B.A. degrees in Chemistry, with several degree options, and in Biochemistry and Molecular Biology. Students beginning study in these programs must have a strong background in chemical science.

Chemistry, widely regarded as a central science, involves the study of matter and the transformation of matter at a molecular level. A very wide range of consumer products, including plastics, personal care products, pharmaceuticals, etc. owe their development at least partially to modern chemistry. Chemists work in industry, educational institutions, and government laboratories, developing new materials, new pharmaceutical, improved chemical analysis methods, etc.

Biochemistry and molecular biology involve the interdisciplinary study of the chemical and physical properties of living systems and the chemical changes that take place in living organisms. Careers in biochemistry and molecular biology require preparation in chemistry and biology, as well as biochemistry and molecular biology. This is a rapidly advancing field, with many recent developments in the unraveling of the genetic code, forensic science, bioinformatics, etc. This field plays a central role in advances in human health.

The department offers both B.S. and B.A. degrees in Chemistry, with several degree options, and in Biochemistry and Molecular Biology. Students beginning study in these programs must have a strong background in chemical science. For the
Biochemistry graduate programs, prior training in the life sciences is desirable but not essential. For more details, see the department website or the Graduate Bulletin Website at www.ndsu.edu/gradschool/bulletin.

Biochemistry and Molecular Biology Major

The Biochemistry and Molecular Biology major is designed to give students a detailed understanding of the chemistry of living matter. Careers exist in medical, pharmaceutical, food processing, and agricultural laboratories. Graduates also will have excellent preparation for graduate school or schools of medicine, dentistry, veterinary science, and business.

Sample '08-09 Curriculum

Biochemistry & Molecular Biology Major

General Education Requirements Credits
First Year Experience (F): UNIV 189, Skills for Academic Success .................1
Communications (C): COMM 110, Fund of Public Speaking .................. 3
ENGL 110, 120, College Comp I, II .................................. 3,3
ENGL 324, Writing in the Sciences .................................. 3
Quantitative Reasoning (R): MATH 165, Calculus I ......................... 4
Science & Technology (S): BIOL 150, 150L, General Biology I, Lab ........ 3,1
PHYS 251, 251L, Univ Physics I, Lab ................................ 4,1
Humanities & Fine Arts (A) ........................................... 6
Social & Behavioral Sciences (B) ..................................... 6
Wellness (W) ................................................................ 2
Cultural Diversity (D) ...................................................... --
Global Perspective (G) ..................................................... 3

Total ...................................................... 122

College/Department Requirements Credits
HUM/SOC SCI Electives (B.S. Degree) ...................... 6
HUM/SOC SCI Electives (B.A. Degree) ...................... 12
Second Year Lang Proficiency (B.A. Degree) ............. --

Total ...................................................... 74

Major Requirements Credits
BIOC 461, 461L, Biochem/Molec Biol I, II ...................... 4,4
BIOC 465, Phys Chem and Biophysics ......................... 4
BIOC 473, Meth Biochem Research ............................... 3
BIOC 474, Recombinant DNA Techniques ..................... 3
BIOC 483, Cell Sig Trans Metabi. ................................. 3
BIOC 487, Mol Bio Gene Expression ......................... 3
CHEM 121, 121L, Gen Chem I, Lab or CHEM 150, 160, Prin of Chem I, Lab .................................. 3,1
CHEM 122, 122L, Gen Chem II, Lab or CHEM 160, 161, Prin of Chem II, Lab .................................. 3,1
CHEM 341, 341L, Organic Chem I, Lab .................................. 3
CHEM 342, 342L, Organic Chem II, Lab .......................... 3
CHEM 380, Chem Junior Seminar ............................... 1
CHEM 431, 431L, Analyst Chem I, Lab .................................. 3
CHEM 491, Chemistry Senior Seminar ......................... 2
CHEM 425, 429, Inorganic Chemistry, Lab ..................... 3,2
CHEM 425, 429, Inorganic Chemistry, Lab ..................... 3,2

Total ...................................................... 74

Chemistry Major

The ACS certified Chemistry major is the basic chemistry degree designed for students seeking careers in the chemical industry, or careers in law, government, journalism, business, etc., that would benefit from a strong background in the physical sciences and mathematics. Many B.S. graduates go on to M.S. or Ph.D. studies. Other degree options include a biochemistry option (also ACS certified), a polymers option (also ACS certified), a pre-professional option, and a chemistry education option.

Students may apply for scholarships available from the Department of Chemistry and Molecular Biology and the Department of Coatings and Polymeric Materials. See www.ndsu.edu/bisonconnection/sfs/scholarships.

Pre-Professional Chemistry Option

This option is designed for students interested in medical, dental, optometry, or veterinary professional school, but who wish to have an alternative career path to careers in industry, law, government, journalism, business, etc., that would benefit from a strong background in the physical sciences and mathematics. This option also provides excellent preparation for graduate study in biochemistry, biotechnology, and molecular biology.

Polymers Option (ACS Certified)

This program is for students who wish to prepare for a career as a chemist in coatings and polymers industries, or for graduate school in polymer chemistry. This is the only program in the U.S. that combines an ACS-certified B.S. degree in Chemistry with a coatings and polymeric materials curriculum. Students have numerous opportunities to participate in the summer research and cooperative programs sponsored by the industry.

Scholarship support from the Department of Coatings and Polymeric materials is available to students who elect this option.

Chemistry Education Option

This option is designed for the student interested in a disciplinary major in chemistry, but who is also considering becoming a chemistry and physics teacher. The curriculum includes physics coursework beyond the usual chemistry major to enable the graduate to teach physics in most states. For teacher certification, students must apply to the School of Education to enroll in the additional requirements, which include EDUC 389, 451, 481, 486, and 487, taken post-baccalaureate. ACS certification may be earned by taking CHEM 471, 472, and 432/432L, as additional courses and choosing BIOC 460 instead of CHEM 260.

Scholarships starting in the sophomore year are available to students in the Chemical Education option.

Sample '08-09 Curriculum

Chemistry Major

General Education Requirements Credits
First Year Experience (F): UNIV 189, Skills for Academic Success .................1
Communications (C): COMM 110, Fund of Public Speaking .................. 3
ENGL 110, 120, College Comp I, II .................................. 3,3
ENGL 321, Writing in Technical Profess or .................................. 3
Quantitative Reasoning (R): MATH 165, Calculus I ......................... 4
Science & Technology (S): CHEM 121, 121L, Gen Chem I, Lab or CHEM 150, 160, Prin of Chem I, Lab .................................. 3,1
CHEM 122, 122L, Gen Chem II, Lab or CHEM 160, 161, Prin of Chem II, Lab .................................. 3,1
PHYS 251, 251L, Univ Physics I, Lab ................................ 4,1
Humanities & Fine Arts (A) ........................................... 6
Social & Behavioral Sciences (B) ..................................... 6
Wellness (W) ................................................................ 2
Cultural Diversity (D) ...................................................... --
Global Perspective (G) ..................................................... 3

Total ...................................................... 74

College/Department Requirements Credits
HUM/SOC SCI Electives (B.S. Degree) ...................... 6
HUM/SOC SCI Electives (B.A. Degree) ...................... 12
Second Year Lang Proficiency (B.A. Degree) ............. --

Total ...................................................... 6-12

Major/Related Requirements (All Options) Credits
CHEM 341, 342, Organic Chemistry I, II ............................. 3,3
CHEM 353, 354, Maj Org Chem Labs I, II .......................... 1,2
CHEM 364, 365, Physical Chemistry I, II .......................... 4,4
CHEM 380, Chem Junior Seminar .................................. 1
CHEM 431, 431L, Analyst Chem I, Lab ............................. 3,2
CHEM 491, Chemistry Senior Seminar .......................... 2
BIOC 460, Found of Biochem & Molec Bio I, II ................. 4
MATH 166, Calculus II .................................................. 4
MATH 128, Intro Linear Algebra .................................. 1
MATH 259, Multivariate Calculus .................................. 3
MATH 266, Intro Diff Equations .................................. 3
PHYS 252, 252L, Univ Physics II, Lab ................................ 4,1

Total ...................................................... 45

Option 1: ACS Chemistry Credits
CHEM 471, Physical Chemistry Lab .................................. 2
CHEM 425, 429, Inorganic Chemistry, Lab ..................... 3,2
CHEM 432, 432L, Analyst Chem II, Lab ............................. 3,1

Option Total ...................................................... 10

Option 2: Biochemistry (ACS Certified) Credits
CHEM 425, 429, Inorganic Chemistry, Lab ..................... 3,2
CHEM 471, Physical Chemistry Lab .................................. 2
BIOC 461, Found. of Biochem & Molec Bio II .................. 4
BIOC 473, Meth Biochem Research .................................. 3
BIOC 474, Meth/Recombinant DNA Tech .......................... 3
MICR 350, 350L, Gen Microbiology, Lab .......................... 3,1
BIOL 150, 150L, General Biology I, Lab .......................... 3,1
BIOL 151, 151L, General Biology II, Lab .......................... 3,1
Biological Sci. Electives .................................................. 6

Option Total ...................................................... 36

Option 3: Coatings and Polymeric Materials Credits
CPM 473, Polymers Synthesis .................................. 3
CPM 474, 484, Coatings I, Lab .................................. 3,2
CPM 475, 485, Coatings II, Lab .................................. 3,2
CHEM 425, 429, Inorganic Chemistry, Lab ..................... 3,2
CHEM 471, Physical Chemistry Lab .................................. 2
CHEM 432, 432L, Analyst Chem II, Lab ............................. 3,1

Option Total ...................................................... 24

Option 4: Pre-Professional Chemistry Credits
CHEM 425, Inorganic Chemistry .................................. 3
MICR 350, 350L, Microbiology I & Lab .......................... 3,1
BIOL 150, 150L, General Biology I, Lab .......................... 3,1
BIOL 151, 151L, General Biology II, Lab .......................... 3,1
BIOL 220, 220L, Human Anat/Phys I, Lab .......................... 3,1
BIOL 221, 221L, Human Anat/Phys II, Lab .......................... 3,1

Option Total ...................................................... 23

Option 5: Chemical Education Credits
CHEM 425, Inorganic Chemistry .................................. 3
EDUC 321, Intro to Teaching .................................. 3
EDUC 322, Educational Psych .................................. 3
EDUC 381, Early Experience .................................. 1
BIOL 150, 150L, General Biology I, Lab .......................... 3,1
Physics Elective ...................................................... 3

College of Science and Mathematics
Department of Computer Science

The Department of Computer Science at NDSU offers degrees and certification in the following undergraduate and graduate areas: Bachelor of Arts: Computer Science; Bachelor of Science: Computer Science; double major in Computer Science and Mathematics; Master of Science: Computer Science or Software Engineering; Ph.D.: Computer Science or Software Engineering; Graduate Certificate: Digital Enterprise (e-commerce) or Software Engineering.

The B.S. program is accredited by the Computing Accreditation Commission of ABET. A minor in computer science is also offered. Advisors will provide assistance to a student on campus, or as an intern with a local business, applying their experience in learning.

After completing part of their studies, students will find many opportunities to work part time as a research assistant to a scientist on campus, as an intern with a local business, applying what they have learned in the classroom. Cooperative education opportunities starting in the junior year are available.

Sample '08-09 Curriculum

Computer Science Major

The Department of Computer Science at NDSU offers degrees in the following undergraduate and graduate areas: Bachelor of Arts: Computer Science; Bachelor of Science: Computer Science or double major in Computer Science and Mathematics; Master of Science: Computer Science or Software Engineering; Ph.D.: Computer Science or Software Engineering; Graduate Certificate: Digital Enterprise (e-commerce) or Software Engineering.

The B.S. program is accredited by the Computing Accreditation Commission of ABET. A minor in computer science is also offered. Advisors will provide assistance to a student on campus, or as an intern with a local business, applying their experience in learning.

After completing part of their studies, students will find many opportunities to work part time as a research assistant to a scientist on campus, as an intern with a local business, applying what they have learned in the classroom. Cooperative education opportunities starting in the junior year are available.

Sample '08-09 Curriculum

Computer Science Major - B.A. & B.S. Degrees

General Education Requirements

Credits
First Year Experience (F):
UNIV 189, Skills for Academic Success
Communications (C):
COMM 110, Fund of Public Speaking
ENGL 110, 120, College Compl I, II
ENGL 321, Writing in Technical Profess or
ENGL 324, Writing in the Sciences
Quantitative Reasoning (R):
MATH 146, Applied Calculus I (B.A.) or MATH 165, Calculus I (B.S.)
Science & Technology (S):
Humanities & Fine Arts (A)
Social & Behavioral Sciences (B)
Wellness (W)
Cultural Diversity (D)
Total

College/Department Requirements

Credits
HUM/SOC SCI Electives (B.S. Degree)
HUM/SOC SCI Electives (B.A. Degree)
Second Year Lang Proficiency (B.A. Degree)
Total

Major/Related Requirements

Credits
CSCI 160, 161, Computer Science I, II
CSCI 335, Theoretical Computer Science I
CSCI 366, Files for Database Systems
CSCI 372, Comparative Languages
CSCI 373, Assembly Programming
CSCI 374, Comp. Org. & Architecture
CSCI 445, Software Projects: Capstone
CSCI 474, Operating Systems Concepts
CSCI 489, Social Implications of Computers
STAT 367, Probability
Total

Additional Requirements (B.A. Only)

Credits
CSCI 114, Microcomputer Packages
CSCI 159, Computer Sci Problem Solving
CSCI 315, Systems Analysis & Design
CSCI 316, System Testing & Maintenance
CSCI 418, Simulation Models

The computer science undergraduate programs, based on recommendations from the Association for Computing Machinery and a constituent of a core of courses required for majors and a large selection of service courses and advanced courses. The computer science undergraduate programs, based on recommendations from the Association for Computing Machinery and a constituent of a core of courses required for majors and a large selection of service courses and advanced courses. The computer science undergraduate programs, based on recommendations from the Association for Computing Machinery and a constituent of a core of courses required for majors and a large selection of service courses and advanced courses. The computer science undergraduate programs, based on recommendations from the Association for Computing Machinery and a constituent of a core of courses required for majors and a large selection of service courses and advanced courses.
A typical first year for all geology majors includes physical geology, the Earth through time, and year-long sequences in English, mathematics, and chemistry.

**Sample ‘08-09 Curriculum Geology Major**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): UNIV 189, Skills for Academic Success</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
</tr>
<tr>
<td>ENGL 324, Writing in the Sciences</td>
</tr>
<tr>
<td>Quantitative Reasoning (R): MATH 165, Calculus I</td>
</tr>
</tbody>
</table>

**Science & Technology (S):**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 105, 105L, Physical Geology</td>
</tr>
<tr>
<td>GEOL 106, 106L, Earth Through Time Lab</td>
</tr>
<tr>
<td>CHEM 121, Gen Chem I or CHEM 150, Prin of Chem I</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>Wellness (W)</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
</tr>
<tr>
<td>GEOL 105, Physical Geology</td>
</tr>
</tbody>
</table>

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUM/SOC SCI Electives (B.S. Degree)</td>
</tr>
<tr>
<td>HUM/SOC SCI Electives (B.A. Degree)</td>
</tr>
<tr>
<td>Second Year Lang Proficiency (B.A. Degree)</td>
</tr>
</tbody>
</table>

**Total** 47

**Major Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 455, Intro to Geographic Info Syst</td>
</tr>
<tr>
<td>GEOL 105, 105L, Physical Geology</td>
</tr>
<tr>
<td>GEOL 106, 106L, Earth Through Time Lab</td>
</tr>
<tr>
<td>GEOL 410, Sedimentology/Stratigraphy</td>
</tr>
<tr>
<td>GEOL 412, Geomorphology</td>
</tr>
<tr>
<td>GEOL 420, 421, Mineralogy, Lab</td>
</tr>
<tr>
<td>GEOL 422, Petrology</td>
</tr>
<tr>
<td>GEOL 423, Petrography</td>
</tr>
<tr>
<td>GEOL 440, Quaternary Biology</td>
</tr>
<tr>
<td>GEOL 450, Field Geology</td>
</tr>
<tr>
<td>GEOL 457, Structural Geology</td>
</tr>
<tr>
<td>GEOL 491, Seminar (Junior Year)</td>
</tr>
<tr>
<td>GEOL 491, Capstone (Senior Year)</td>
</tr>
<tr>
<td>SOIL 444, Soil Genesis &amp; Survey</td>
</tr>
</tbody>
</table>

**Total** 45

**Curriculum Total (min)** - B.A. or B.S. - 122

1 Refer to department or curriculum guide for course options.

**Teaching Option:** Curriculum emphasis is on the teaching of Earth science. Students preparing for teaching Earth science in the secondary schools must follow the School of Education curriculum.

**Sample ‘08-09 Curriculum Earth Science Education Major**

**General Education Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): UNIV 189, Skills for Academic Success</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
</tr>
<tr>
<td>ENGL 324, Writing in the Sciences</td>
</tr>
<tr>
<td>Quantitative Reasoning (R): MATH 165, Calculus I</td>
</tr>
<tr>
<td>Science &amp; Technology (S): BIOL 150, 150L, Gen Biology I, Lab</td>
</tr>
<tr>
<td>ENGL 217, Intro to Meteorology</td>
</tr>
<tr>
<td>PHYS 110, Intro Astronomy</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>Wellness (W)</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
</tr>
<tr>
<td>GEOL 105, Physical Geology</td>
</tr>
</tbody>
</table>

**Total** 47
Department of Mathematics

www.ndsu.edu/math

Mathematics Major

Mathematics is the language of science and technology. Its explosive development in the 20th century and its history as the oldest and most highly developed discipline make it one of the most exciting and rewarding areas of study.

The use of mathematics and the need for mathematical competence has increased tremendously. Mathematical training is in high demand in such fields as actuarial science, business, economics and commerce, engineering, and statistics, as well as the basic sciences. These disciplines, in turn, feed back new directions to the mathematical community. Trends indicate that students should plan their programs to reflect the increased emphasis on interdisciplinary competency.

Students are able to study theoretical and applied mathematics to prepare for careers or for further schooling while studying with faculty members who have a wide range of interests and expertise. Students may earn academic credit by applying what they have learned in the classroom as they gain on-the-job experience through the Cooperative Education program. Opportunities also exist for students to work as paper graders and assistants to professional mathematicians.

The department offers a broad and balanced curriculum of courses. A student may major or minor in Mathematics or Mathematics Education.

Students interested in Mathematics Education should consult with their major advisor and the School of Education for professional education requirements. To meet requirements of the “No Child Left Behind” Act 2001, students interested in Mathematics Education are encouraged to declare a double major in their discipline and in education (i.e., mathematics education and mathematics). Such double majors may typically be earned by successful completion of a few additional credits. Students should contact their advisors or the Office of Registration and Records, Ceres 110, to declare their primary and secondary majors with the Office of Registration and Records, Ceres 110.

Special double majors are available with computer science, physics, and statistics. These double majors take advantage of the close relationship between mathematics and other disciplines, and allow students pursuing a major in one of these fields to expand their mathematical background.

While the choice of major need not be made during the freshman year, an early decision allows more flexibility in tailoring programs to individual interests. The department also has a graduate program offering both an M.S. and a Ph.D. in Mathematics.

Pre-Actuarial Science Option

Actuarial science is the study of the evaluation and measurement of risk. The Actuary Science option is a pre-professional program designed to provide the background needed to enter the field. Entrance into the profession is regulated under a system of examinations run by actuarial professional societies. The curriculum of the option is designed to prepare the student to pass several of these examinations. The nature of the actuarial profession requires its practitioners to have a broad knowledge of finance, law, mathematics, management, and statistics. This option leads to a double major in mathematics and statistics with either a minor in economics or additional courses in business. Students selecting this option are requested to visit with the actuarial advisor in the Department of Mathematics early and often to confirm their progress and to inform themselves of changes in the examination curriculum.

Sample '08-09 Curriculum

Math & Computer Science Double Major

General Education Requirements

First Year Experience (F): UNIV 189, Skills for Academic Success ............... 1

Communications (C): COMM 110, Fund of Public Speaking ..................... 3
ENGL 110*, 120, College Comp I, II ........................................ 3
ENGL Upper Level Writing Course2 ........................................ 3
Quantitative Reasoning (Q): MATH 165, Calculus I ..................................... 4
Science & Technology (S) ...................................................... 10
Humanities & Fine Arts (A) ................................................... 6
Social & Behavioral Sciences (B) .............................................. 6
Wellness (W) ................................................................. 2
Cultural Diversity (D) ............................................................ 2
Global Perspective (G) ............................................................ 2

Total ................................................................. 41

College/Department Requirements

CSCI 160, Computer Science I ................................................. 4
Lab Science Sequence2 ........................................................ 8-10
CSCI Electives2 ................................................................. 6
Free Electives (for degree completion) ....................................... 14-22
Total ................................................................. 42

Curriculum Total (min) ..................................................... 122

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received).
2 Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.
3 May double count with Select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.
4 Refer to department or curriculum guide for course options.

Sample '08-09 Curriculum

Mathematics Major

General Education Requirements

First Year Experience (F): UNIV 189, Skills for Academic Success ............... 1

Communications (C): COMM 110, Fund of Public Speaking ..................... 3
ENGL 110*, 120, College Comp I, II ........................................ 3
ENGL Upper Level Writing Course2 ........................................ 3
Quantitative Reasoning (Q): MATH 165, Calculus I ..................................... 4
Science & Technology (S) ...................................................... 10
Humanities & Fine Arts (A) ................................................... 6
Social & Behavioral Sciences (B) .............................................. 6
Wellness (W) ................................................................. 2
Cultural Diversity (D) ............................................................ 2
Global Perspective (G) ............................................................ 2

Total ................................................................. 41

College/Department Requirements

CSCI 160, Computer Science I ................................................. 4
Lab Science Sequence2 ........................................................ 8-10
CSCI Electives2 ................................................................. 6
Free Electives (for degree completion) ....................................... 14-22
Total ................................................................. 42

Curriculum Total (min) ..................................................... 122

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received).
2 Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.
3 Refer to department or curriculum guide for course options.
4 May double count with Select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.

Sample '08-09 Curriculum

Geography Minor

Emphasizes in the geography program are: (a) gaining an understanding of the geographic perspective, and (b) acquiring skills in the use of spatial analysis tools (such as geographic information systems (GIS), computer mapping, and other computer applications).

Geography offers a minor that may be taken in conjunction with a variety of majors such as social science and secondary education. Minor requirements are 18 credits selected in consultation with the geography advisor. Students preparing for teaching geography in the secondary schools should follow the School of Education curriculum.

Sample '08-09 Curriculum

Geography Minor

Requirements

CSCI Electives2 ................................................................. 6

Curriculum Total ................................................................. 18

1 Refer to department or curriculum guide for course options.
2 May double count with Select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.
3 Refer to department or curriculum guide for course options.
4 May double count with Select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.
College/Department Requirements

Credits

HUM/SOC SCI Electives (B.S. Degree) ................. 6
HUM/SOC SCI Electives (B.A. Degree) ............... 12
Second Year Lang Proficiency (B.A. Degree) ...... --
Total ................................................................ 6-12

Major Requirements

Credits

MATH 166, Calculus II ................................ 4
MATH 165, Calculus III ................................ 4
MATH 266, Intro to Differential Equations ........ 3
MATH 270, Intro to Abstract Math .................. 3
MATH 420, Abstract Algebra I ....................... 3
MATH 429, Linear Algebra ............................ 3
MATH 450, Real Analysis I ......................... 3
MATH 421, Abstract Algebra II ...................... 3
MATH 451, Real Analysis II ...................... 3
MATH 491, Capstone Seminar ...................... 1
MATH/STAT Electives ............................... 4
PHYS 251R, Univ Physics I, Recitation .......... 1
PHYS 252R, Univ Physics II, Recitation ....... 1
PHYS 350, Modern Physics ......................... 3
PHYS 350 (MSUM), Intermediate Science III .. 3
PHYS 351, Mechanics I .............................. 4 or 3
PHYS 361, Electromagnetic Theory or
PHYS 370 (MSUM), Electromag Theory .......... 3 or 4
PHYS 370, Intro to Computational Physics ....... 3
PHYS 462, Heat & Thermodynamics ............... 3
PHYS 471, Adv Physics Lab ........................ 2
PHYS 485, Quantum Mechanics I ................. 3
PHYS 486, Quantum Mechanics II ............... 3
PHYS 489, Capstone - Senior Project ............. 1
Total ...................................................... 57-59

Additional Requirements

Credits

Free Electives (for degree completion) .......... 3-11
Total ...................................................... 3-11

Curriculum Total (min.) (in.) ......................... 122

Sample '08-'09 Curriculum

Mathematics & Statistics Double Major

General Education Requirements Credits

First Year Experience (F): 
UNIV 189, Skills for Academic Success ....... 1
Communications (C): 
COMM 110, Fund of Public Speaking ........... 3
ENGL 110, 120, College Comp I, II .......... 3,3
ENGL Upper Level Writing Course 3 
Quantitative Reasoning (R): 
MATH 165, Calculus I ............................... 4
Science & Technology (S): 
PHYS 251, 251L, Univ Physics I, Lab ....... 3,4
PHYS 252, 252L, Univ Physics II, Lab ....... 3,4
Humanities & Fine Arts (A) ...................... 6
Social & Behavioral Sciences (B) .............. 6
Wellness (W) ........................................... 2
Cultural Diversity (D) .................. --
Global Perspective (G) .................. --
Total ...................................................... 41

College/Department Requirements

Credits

HUM/SOC SCI Electives (B.S. Degree) .......... 6
HUM/SOC SCI Electives (B.A. Degree) ....... 12
Second Year Lang Proficiency (B.A. Degree) .... --
Total ...................................................... 6-12

Major/Related Requirements (both options) Credits

MATH 166, Calculus II .............................. 4
MATH 365, Calculus III ............................ 4
MATH 266, Intro Diff Equations ................. 3
MATH 270, Intro to Abstract math ............... 3
MATH 429, Linear Algebra ........................ 3
MATH 450, Real Analysis I ....................... 3
STAT 330, Intro to Stats ......................... 3
STAT 461, Applied Regression Models ......... 3
STAT 462, Intro to Experimental Design ....... 3
STAT 467, Probability & Math Stats I ......... 3
STAT 468, Probability & Math Stats II ...... 3
CSCI 160, Computer Science I .................. 3
CSCI 161, Computer Science II ................. 3
Lab Science Sequence/Science Elective ....... 10
Total ...................................................... 57

Option 1: General Double Major

Credits

MATH 420, Abstract Algebra I ..................... 3
MATH 451, Real Analysis II ....................... 3
STAT 476, Actuary Exam Study II or
STAT 491, Capstone Seminar ................... 1
STAT 400 Level Electives ......................... 12
CSCI Electives .......................... --
Total ...................................................... 6

Option 2: Pre-Actuarial Science

Credits

ACCT 200, Elements of Accounting I .......... 3
ACCT 201, Elements of Accounting II ....... 3
ECON 201, Prin of Microeconomics ........... 3
ECON 202, Prin of Macroeconomics .......... 3
MATH 451, Real Analysis II or
MATH 489, Numerical Analysis ................. 3
MATH 488, Numerical Analysis II .......... 3
MATH 376, Actuarial Exam Study ............... 1
STAT 476, Actuary Exam Study ................. 1
STAT 400 Level Electives ......................... 9
BUSN/ECON/CSCI Electives ..................... 9
Total ...................................................... 38

Curriculum Total (min.) (in.) ......................... 122

Sample '08-'09 Curriculum

Mathematics Education Major

General Education Requirements Credits

First Year Experience (F): 
UNIV 189, Skills for Academic Success ....... 1
Communications (C): 
COMM 110, Fund of Public Speaking ........... 3
ENGL 110, 120, College Comp I, II .......... 3,3
ENGL Upper Level Writing Course 3 
Quantitative Reasoning (R): 
MATH 165, Calculus I ............................... 4
Science & Technology (S) ..................... 10
Humanities & Fine Arts (A) ...................... 6
Social & Behavioral Sciences (B) .............. 6
Wellness (W) ........................................... 2
Cultural Diversity (D) .................. --
Global Perspective (G) .................. --
Total ...................................................... 41

College/Department Requirements

Credits

HUM/SOC SCI Electives (B.S. Degree) .......... 6
HUM/SOC SCI Electives (B.A. Degree) ....... 12
Second Year Lang Proficiency (B.A. Degree) .... --
Total ...................................................... 6-12
A grade-point average of 2.00 or higher is required in all physics courses. Courses do not count toward the major if the grade is less than a C.

**Computational Physics Option**
Computational physics is a rapidly growing sub-discipline of physics, concerned with computational aspects of physical problems, including computer simulation and numerical techniques for the solution of mathematical equations arising in all areas of physics. As computing power grows, computer modeling is becoming an increasingly important research and development tool. Correspondingly, there is a rising demand for scientists with multidisciplinary training that combines fundamental knowledge of physics with practical skills in computation. The computational physics option recognizes the unique qualifications of students who complete computation-related courses in addition to fulfilling the requirements for the physics majors. Graduates of the option will be qualified to work in industry or to pursue graduate studies in physics, computer science, engineering, or other technical fields.

**Optical Science and Engineering Option**
This program is for students who wish to prepare for a career as a physicist in photonics or for graduate school in optics or photonics. Today, light is at the core of technologies ranging from computing and communications to surgical techniques. There are more than 5,000 optics-related companies in the United States alone, but even more important, photonics provides the technical foundation for many more. Optical science and engineering has exploded to encompass nearly all fields of science and technology with a consequent shortage of individuals trained in the field. This option provides the necessary interdisciplinary background in physics and electrical engineering through a structured sequence of courses. This is the only program of this type in the region.

---

**Sample '08-09 Curriculum**

### Mathematics Minor
A minor in Mathematics requires 21 credits in select math courses. A grade of C or better is required in these courses. Contact the department for details.

### Sample '08-09 Curriculum

#### Mathematics Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 165, Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 166, Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 265, Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 300-400 Level Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

**Curriculum Total.** 21

---

**Department of Physics**

**www.ndsu.edu/ndsu/physics**

### Physics Major
Students who complete a major in Physics are prepared for careers in industrial and governmental research and development; for graduate study in physics, astronomy, engineering, medicine, oceanography, materials science; and for environmental science. In-depth preparation also is provided for teaching in secondary schools.

To meet requirements of the "No Child Left Behind" Act 2001, students interested in Physics Education are encouraged to declare a dual major in their discipline and in education (i.e., physics education and physics). Such dual majors may typically be earned by successful completion of a few additional credits. Students should contact their advisor or the Office of Registration and Records for details and are encouraged to declare their primary and secondary majors with the Office of Registration and Records, Ceres 110.

---

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUM/SOC SCI Electives (B.S. Degree)</td>
</tr>
<tr>
<td>HUM/SOC SCI Electives (B.A. Degree)</td>
</tr>
</tbody>
</table>

**Second Year Lang Proficiency (B.A. Degree)**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total.</td>
</tr>
</tbody>
</table>

---

**Major/Related Requirements (all options)**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 251R, Univ Physics I, Recitation</td>
</tr>
<tr>
<td>PHYS 252R, Univ Physics II, Recitation</td>
</tr>
<tr>
<td>PHYS 350, Modern Physics</td>
</tr>
<tr>
<td>PHYS 330 (MUSM), Intermediate Mechanics or PHYS 351, Mechanics I</td>
</tr>
<tr>
<td>PHYS 361, Electromagnetic Theory or PHYS 370 (MUSM), Electromag Theory</td>
</tr>
</tbody>
</table>

---

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>ENGL 1101, 120, College Comp I, II</td>
</tr>
<tr>
<td>ENGL Upper Level Writing</td>
</tr>
<tr>
<td>Quantitative Reasoning (R): MATH 165, Calculus I</td>
</tr>
<tr>
<td>Science &amp; Technology (S): PHYS 251, 251L, Univ Physics I, Lab</td>
</tr>
<tr>
<td>PHYS 252, 252L, Univ Physics II, Lab</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>Wellness (W)</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
</tr>
</tbody>
</table>

**Total.** 41

---

**Sample '08-09 Curriculum**

### Physics Education Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
</tr>
<tr>
<td>ENGL 1101, 120, College Comp I, II</td>
</tr>
<tr>
<td>ENGL Upper Level Writing</td>
</tr>
<tr>
<td>Quantitative Reasoning (R): MATH 165, Calculus I</td>
</tr>
<tr>
<td>Science &amp; Technology (S): PHYS 251, 251L, Univ Physics I, Lab</td>
</tr>
<tr>
<td>PHYS 252, 252L, Univ Physics II, Lab</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
</tr>
<tr>
<td>Wellness (W)</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
</tr>
</tbody>
</table>

**Total.** 41

---

**College/Department Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUM/SOC SCI Electives (B.S. Degree)</td>
</tr>
<tr>
<td>HUM/SOC SCI Electives (B.A. Degree)</td>
</tr>
</tbody>
</table>

**Second Year Lang Proficiency (B.A. Degree)**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total.</td>
</tr>
</tbody>
</table>

---

**Major/Related Requirements (all options)**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 251R, Univ Physics I, Recitation</td>
</tr>
<tr>
<td>PHYS 252R, Univ Physics II, Recitation</td>
</tr>
<tr>
<td>PHYS 350, Modern Physics</td>
</tr>
<tr>
<td>PHYS 330 (MUSM), Intermediate Mechanics or PHYS 351, Mechanics I</td>
</tr>
<tr>
<td>PHYS 361, Electromagnetic Theory or PHYS 370 (MUSM), Electromag Theory</td>
</tr>
</tbody>
</table>

**Total.** 41

---

**Option 1: General Physics**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS Electives</td>
</tr>
</tbody>
</table>

**Total.** 46

---

**Option 2: Computational Physics**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 463, Statistical Mechanics</td>
</tr>
<tr>
<td>PHYS Electives</td>
</tr>
<tr>
<td>CSCI 160, Computer Science I</td>
</tr>
<tr>
<td>CSCI 161, Computer Science II</td>
</tr>
<tr>
<td>ECE 173, Intro to Computing</td>
</tr>
<tr>
<td>STAT 367, Probability</td>
</tr>
<tr>
<td>STAT 368, Statistics</td>
</tr>
</tbody>
</table>

**Total.** 23

---

**Option 3: Optical Science/Engineering**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 413, Lasers for Scientists &amp; Engineers</td>
</tr>
<tr>
<td>PHYS 415, Elements of Photonics</td>
</tr>
<tr>
<td>ECE 173, Intro to Computing</td>
</tr>
<tr>
<td>EE 206, Circuit Analysis I</td>
</tr>
<tr>
<td>Recommended Courses: ECE 311, Circuit Analysis II</td>
</tr>
<tr>
<td>ECE 321, Electronics I</td>
</tr>
<tr>
<td>ECE 417, Optical Signal Transmission</td>
</tr>
<tr>
<td>ECE 483, Instrumentation for Engineers</td>
</tr>
</tbody>
</table>

**Total.** 13-28

---

**Curriculum Total (min) - All Options.** 122

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with composite ACT scores of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.

4 May substitute with PHYS 753, Classical Mechanics I, with department permission.

---

**Curriculum Total (min) - All Options.** 122

1 Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with composite ACT scores of less than 21 are required to register for English 110.

2 Refer to department or curriculum guide for course options.

3 May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed courses.

4 May substitute with PHYS 753, Classical Mechanics I, with department permission.
### College/Department Requirements Credits

**CHEM 121L, Gen Chem I Lab** ........................................... 1
**STAT 330, Intro Stats** .................................................. 3
**Total** ........................................................................... 4

### Major Requirements Credits

**CHEM 122, 122L, Gen Chem II, Lab** .................................. 3,1
**CHEM Elective** ................................................................. 4
**GEOL 105, 105L, Physical Geology, Lab** .......................... 3,1
**GEOL 106, 106L, Earth Through Time, Lab** ..................... 3,1
**MATH 166, Calculus II** ..................................................... 4
**MATH 265, Calculus III** ................................................... 4
**MATH 266, Intro to Differential Equations** ......................... 3
**PHYS 110, Intro Astronomy** ............................................. 3
**PHYS 251, 251L, Univ Physics I, Lab** .............................. 4,1
**PHYS 252, 252L, Univ Physics II, Lab** .............................. 4,1
**PHYS 350, Modern Physics** ............................................. 3
**PHYS 351, Mechanics I** ................................................ 3
**PHYS 361, Electromagnetic Theory** ............................... 4
**PHYS 411, 411L, Optics/Scientists & Engr.** ....................... 3,1
**PHYS 462, Heat & Thermodynamics** .............................. 3
**PHYS 471, Adv Physics Lab** ............................................ 2
**PHYS 485, Quantum Mechanics I** .................................. 3
**PHYS 491, Seminar** ....................................................... 1
**PHYS Electives** ............................................................. 6
**Total** ........................................................................... 69

### Professional Education Requirements Credits

**EDUC 321, Intro to Teaching** .......................................... 3
**EDUC 322, Educational Psychology** ............................... 3
**EDUC 381, Early Experience** ......................................... 1
**EDUC 451, Instruc, Planning, Meth & Assess** .................... 3
**EDUC 481, Classrm Prac/Meth of Teach I-Sci** ..................... 3
**EDUC 485, Student Teach Seminar** ................................ 1
**EDUC 486, Classrm Mgt of Diverse Learners** ..................... 2
**EDUC 487, Student Teaching** .......................................... 9
**EDUC 488, Applied Student Teaching** .............................. 3
**EDUC 489, Nat American/Multicult Inst Prac** ..................... 3
**Total** ........................................................................... 69

### Curriculum Total Credits

**Total** ........................................................................... 145-146

---

### Department of Psychology

[www.ndsu.edu/psych](http://www.ndsu.edu/psych)

Psychology is concerned with behavior, both of human beings and other living organisms. In studying behavior, psychologists rely heavily upon the methods of science. Some areas of psychology are more closely related to the natural and biological sciences while other areas within psychology are more closely related to the social sciences, especially sociology, anthropology, and communication. Both an undergraduate major and an undergraduate minor in psychology are available. Psychology majors may select the degree program that best suits their needs and interests from the B.A. and B.S. tracks outlined in this section.

All majors must complete 30 credits in psychology as listed in the outline for the B.S. degree. Additional courses in psychology may be selected, in consultation with the advisor, from any of those listed under the department’s offerings. Courses in the major field may not be taken on a pass/fail basis (except PSYC 494 and 496, which may be graded on a pass/fail basis by the instructor).

The psychology major also requires a supporting track in one of the following areas:

1. Natural Science Track: 14 additional credits in math, computer science, statistics, and/or science
2. Social Science Track: 14 additional credits in social science (other than psychology)
3. A minor in an approved area of study

---

### Career Orientation Overlays

An undergraduate education in psychology leads to a number of career choices following graduation. To assist students in preparing for post-graduate work and careers in psychology or related fields, the department has prepared several Career Orientation OverLays (COOLs). COOLs establish curriculum guidelines and suggestions for students who may be interested in a variety of careers, including medicine and neurosciences, business and industry, graduate school in psychology, or mental health and applied psychology. COOLs, when used in conjunction with the counsel of an advisor, are intended to help a student select the best courses within and outside of psychology (e.g., biology for medicine or business for industrial psychology) to suit particular interests and career goals.

---

### Advising Centers

Information for students is available on the department website and at the department in Minard Hall. Topics include requirements for majors and minors, COOLs, graduate school, and career information.

### Psychology Major

A total of 122 credits is required for a major in psychology leading toward a Bachelor of Science or Bachelor of Arts degree. The following requirements must be fulfilled:

#### Sample '08-09 Curriculum

### Psychology Major

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F)</td>
<td></td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C)</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 101, 120, College Comp I, II</td>
<td>3-3</td>
</tr>
<tr>
<td>ENGL 324, Writing in the Sciences or ENGL 325, Writing in Health Prof or ENGL 459, Research/Writing Grants</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td></td>
</tr>
<tr>
<td>STAT 330, Intro Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
</tbody>
</table>

---

### Notes

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for ENGL 120 with a passing grade. (P). Students with a composite ACT score of less than 21 are required to register for English 110.
3. Refer to department or curriculum guide for course options.

---

### College of Science and Mathematics

### Wellness (W)

**Credits** ...................................................... 2

---

### Cultural Diversity (D)

**Credits** ...................................................... 3

---

### Global Perspective (G)

**Credits** ...................................................... 2

---

### Total Credits

**Credits** ...................................................... 40

---

### College/Department Requirements Credits

**HUM/SOC SCI Electives (B.A.)** ........................................ 6
**HUM/SOC SCI Electives (B.A.)** ....................................... 12
**Second Year Lang Proficiency (B.A.)** ............................

**Total** ........................................................................... 6-12

### Major Requirements Credits

**PSYC 111, Intro to Psychology** ..................................... 3
**PSYC 350, Research Methods I** .................................... 3
**PSYC 351, Research Methods II** ................................... 3
**400 level Psychology Electives** .................................... 15
**Additional Psychology Electives** .................................. 6

**Total** ........................................................................... 30

### Related Requirements Credits

**Free Electives (for degree completion)** .......................... 12-26

**Total** ........................................................................... 12-26

### Curriculum Total (min.)

**Credits** ...................................................... 122

---

### Mathematics and Physics

#### Double Major

This program is for students who want additional theoretical background and preparation for graduate or technical careers in the sciences. See sample curriculum under Mathematics.

### Physics Minor

A Physics minor consists of 19 credits. At least 8 credits must be taken at NDSU.

### Sample '08-09 Curriculum

#### Physics Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 251, 251L, Univ Physics I, Lab</td>
<td>4,1</td>
</tr>
<tr>
<td>PHYS 252, 252L, Univ Physics II, Lab</td>
<td>4,1</td>
</tr>
<tr>
<td>PHYS 251R, Univ Physics I, Recitation</td>
<td></td>
</tr>
<tr>
<td>PHYS 252R, Univ Physics II, Recitation</td>
<td></td>
</tr>
<tr>
<td>PHYS 350, Modern Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 300-400 Level Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

**Curriculum Total** .................................................... 21

---

### College of Science and Mathematics

#### Wellness (W)

**Credits** ...................................................... 2

---

### Cultural Diversity (D)

**Credits** ...................................................... 3

---

### Global Perspective (G)

**Credits** ...................................................... 2

---

### Total Credits

**Credits** ...................................................... 40

---

### College/Department Requirements Credits

**HUM/SOC SCI Electives (B.A.)** ........................................ 6
**HUM/SOC SCI Electives (B.A.)** ....................................... 12
**Second Year Lang Proficiency (B.A.)** ............................

**Total** ........................................................................... 6-12

### Major Requirements Credits

**PSYC 111, Intro to Psychology** ..................................... 3
**PSYC 350, Research Methods I** .................................... 3
**PSYC 351, Research Methods II** ................................... 3
**400 level Psychology Electives** .................................... 15
**Additional Psychology Electives** .................................. 6

**Total** ........................................................................... 30

### Related Requirements Credits

**Free Electives (for degree completion)** .......................... 12-26

**Total** ........................................................................... 12-26

### Curriculum Total (min.)

**Credits** ...................................................... 122

---

### Notes

1. Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for ENGL 120 with a passing grade. (P). Students with a composite ACT score of less than 21 are required to register for English 110.
3. Refer to department or curriculum guide for course options.

### Psychology Minor

A minor in Psychology offers students electing majors in other disciplines the opportunity to complement their studies with a coherent set of psychology courses. Different courses are compatible with interests and career goals of students in major areas such as business, child development and family science, and computer science. Students planning a Psychology minor should consult with a faculty advisor from the Department of Psychology.

Students selecting a minor in Psychology must complete 18 credits in psychology (excluding PSYC 494 or 496). These 18 semester credits may not be taken pass/fail and must include at least one 3-credit 300- or 400-level course. A minimum of eight credits must be taken at NDSU.

### Sample '08-09 Curriculum

#### Psychology Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 111, Intro to Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSYC Electives</td>
<td>15</td>
</tr>
</tbody>
</table>

**Total** ........................................................................... 18

---

### Neuroscience Minor

A 17 credit minor in Neuroscience is also available. See the department of Psychology for details.
## Sample '08-09 Curriculum

### Behavioral Statistics Major

This degree is a joint effort between the Department of Statistics and the Department of Psychology. It is recommended that a student wishing to obtain a degree in Behavioral Statistics consult with an advisor in both departments. This major prepares students for careers involving collecting and analyzing data on human behavior, for example, in Medicare, insurance, market research, or health, educational and social services. Graduates of this program are expected to have good quantitative reasoning skills and to have strong people skills. Note: this curriculum also fulfills requirements for the B.S. in Psychology. See the sample curriculum under Mathematics.

### Sample '08-09 Curriculum

#### Behavioral Statistics Major

**General Education Requirements**

<table>
<thead>
<tr>
<th>First Year Experience (F):</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communications (C):</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, 120, College Comp I, II</td>
<td>3.3</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quantitative Reasoning (R):</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 165, Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH II</td>
<td>4</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B)</td>
<td>6</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td>2</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>2</td>
</tr>
</tbody>
</table>

| Total | 41 |

**College/Department Requirements**

| HUM/SOC SCI Electives (B.S. Degree) | 6 |
| HUM/SOC SCI Electives (B.A. Degree) | 12 |
| Second Year Lang Proficiency (B.A. Degree) | 6 |

| Total | 6-12 |

**Major Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 367, Probability</td>
</tr>
<tr>
<td>STAT 368, Statistics</td>
</tr>
<tr>
<td>STAT 461, Applied Regression Models</td>
</tr>
<tr>
<td>STAT 462, Intro/Experimental Design</td>
</tr>
<tr>
<td>STAT 476, Actuary Exam Study II or STAT 491, Capstone Seminar</td>
</tr>
<tr>
<td>CSCI/MATH/STAT Electives</td>
</tr>
</tbody>
</table>

| Total | 28 |

**Related Requirements**

| CSCI 126, Beginning FORTRAN or CSCI 160, Computer Science I or CSCI 227, Comput Fundamentals I | 3 |
| CSCI 222, Discrete Math or MATH 270, Intro to Abstract Math | 4 |
| MATH 129, Linear Algebra | 2 |
| MATH 166, Calculus II | 4 |
| MATH 265, Calculus III | 4 |

| Total | 16-17 |

**Additional Requirements**

| Free Electives (for degree completion) | 24-31 |

| Total | 24-31 |

---

### Mathematics and Statistics Double Major

#### Pre-Actuarial Science Option

Actuarial science is the study of the evaluation and measurement of risk. The Actuarial Science option is a pre-professional program designed to provide the background needed to enter the field. Entrance into the profession is regulated under a system of examinations run by actuarial professional societies. The curriculum for this option is designed to prepare the student to pass several of these examinations.

The nature of the actuarial profession requires its practitioners to have a broad knowledge of finance, law, mathematics, management, and statistics. This option leads to a double major in Mathematics and Statistics with either a minor in Economics or additional courses in business. Students selecting this option are requested to visit with the actuarial advisors in both the Departments of Mathematics and Statistics early and often to confirm their progress and to inform themselves of changes in the examination curriculum. See sample curriculum under Mathematics.

---

### Additional Requirements

**Credits**

| Free Electives | 7-16 |

| Total | 7-16 |

---

### Curriculum Total (min.)

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 331, Regression Analysis</td>
</tr>
<tr>
<td>STAT 462, Intro to Experimental Design</td>
</tr>
<tr>
<td>STAT 470, Statistical SAS Programming</td>
</tr>
<tr>
<td>PSYC/STAT 480, History &amp; Systems or PSYC/STAT 489, Honor’s or PSYC/STAT 491, Capstone Seminar</td>
</tr>
</tbody>
</table>

| Total | 42-44 |

---

### Related Requirements

**Credits**

| MATH 103, College Algebra or MATH 104, Finite Math | 3 |
| PSYC Behavior Electives | 9 |
| STAT Elective | 6 |

| Total | 18 |

---

### Additional Requirements

**Credits**

| Free Electives (for degree completion) | 7-16 |

| Total | 7-16 |

---

### Curriculum Total (min.)

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 331, Regression Analysis</td>
</tr>
<tr>
<td>STAT 462, Intro to Experimental Design</td>
</tr>
<tr>
<td>STAT 470, Statistical SAS Programming</td>
</tr>
<tr>
<td>PSYC/STAT 480, History &amp; Systems or PSYC/STAT 489, Honor’s or PSYC/STAT 491, Capstone Seminar</td>
</tr>
</tbody>
</table>

| Total | 42-44 |

---

### Curriculum Total (min.)

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 331, Regression Analysis</td>
</tr>
<tr>
<td>STAT 462, Intro to Experimental Design</td>
</tr>
<tr>
<td>STAT 470, Statistical SAS Programming</td>
</tr>
<tr>
<td>PSYC/STAT 480, History &amp; Systems or PSYC/STAT 489, Honor’s or PSYC/STAT 491, Capstone Seminar</td>
</tr>
</tbody>
</table>

| Total | 42-44 |

---

### Statistics Minors

Two different minors in Statistics are offered. A Department of Statistics (Waldron 201) advisor for minors must approve the program.

### Sample '08-09 Curriculum

#### Applied Statistics Minor

**Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 330, Intro to Stats</td>
</tr>
<tr>
<td>STAT 331, Regression Analysis</td>
</tr>
<tr>
<td>STAT 400 Level Electives</td>
</tr>
</tbody>
</table>

| Total | 17 |

---

### Sample '08-09 Curriculum

#### Statistics Minor

**Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 165, Calculus I</td>
</tr>
<tr>
<td>MATH 166, Calculus II</td>
</tr>
<tr>
<td>MATH 351, Regression Analysis or STAT 461, Applied Regression Models</td>
</tr>
<tr>
<td>STAT 367, Probability</td>
</tr>
<tr>
<td>STAT 462, Intro to Experimental Design</td>
</tr>
<tr>
<td>STAT 400 Level Elective</td>
</tr>
</tbody>
</table>

| Total | 22-23 |

---

### Curriculum Total (min.)

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Electives</td>
</tr>
</tbody>
</table>

| Total | 7-16 |

---

### Notes:

- Effective fall 2007, students with composite ACT scores of 21 or higher should register for English 120 (unless transfer credit for ENGL 120 is received). Students who complete English 120 with a C or higher will receive credit for English 110 with a passing grade (P). Students with a composite ACT score of less than 21 are required to register for English 110.
- Refer to department or curriculum guide for course options.
- May double count with select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech GenEd courses.

---

### College of Science and Mathematics

Statistics involve the analysis of numerical data. This ranges from the calculation of simple statistics to the mathematical theory behind very sophisticated statistical procedures. Professionals in areas such as agriculture, pharmacy, business, human development, and the social sciences use statistical tools. The Department of Statistics offers a major leading to a B.S., M.S., or Ph.D. degree, as well as minors in Statistics for both undergraduate and graduate students. The program is flexible enough to be individually planned around prior experience and in accord with professional goals. The program emphasis is on applied statistics, consulting, and computational methods.
Programs in the College of University Studies are designed for students with general needs or unique goals. These programs involve general studies for deciding students or the Bachelor of University Studies degree (a tailored degree program) for students with distinctive educational goals.

General Studies

The general studies program is designed to serve new students who wish to enter college but are unsure about their plans for the future. Special attention is given to selecting the best advisors, giving students a chance to explore a variety of fields, and acquainting them with people who are familiar with post-graduation opportunities.

Students in general studies may elect any pattern of courses for which they have satisfactory preparation. They may carry as little as one course (usually three hours of class a week), a full load of four or five courses, or on rare occasions, as many as six or seven courses.

Transfer to other colleges on campus from this program or into this program is possible at any time. Most students elect to pursue a major in one of the other academic units at NDSU by the end of their third semester.

Bachelor of University Studies Degree

Students with no fewer than 15 semester credits remaining and wishing to tailor their own degree may do so by proposing a plan of study. Upon approval, this plan of study leads to a Bachelor of University Studies (B.U.S.) degree.

Students seeking the Bachelor of University Studies degree usually begin by visiting the Associate Dean’s office and talking with an advisor about their long-range hopes and aspirations. Together, they select an advisor whose professional skills and interests most closely coincide with those of the student. The advisor will work with the student in preparing a statement of goals, a summary of previous education and experience, and a plan of study for the degree. After both have signed the proposal, it is forwarded to the Academic Policies/Program Review committee of the College of University Studies for approval.

If the proposal is approved by the committee, it becomes a set of requirements for graduation. Each program must meet the general education requirements and the graduation requirements of the university. The Bachelor of University Studies does not allow an academic minor or second major, but students are encouraged to create an area(s) of emphasis.

Experiential Learning Credit

Students may gain credit for university-level experiential learning depending on how their experience relates to their educational objectives and the pattern of formal education they plan to pursue. Students requesting credit for university-level experience must prepare summaries of their learning, including time periods, job descriptions, responsibilities, on-the-job training, verification of employment, and any other pertinent information according to published guidelines. Credit may be requested for any type of experience provided the experience leads to university-level learning and is related to educational goals. Ultimately, students must be prepared to demonstrate increased knowledge, problem-solving ability, ability to understand people, or some other significant personal growth as the result of their experience.

Cooperative Education

Cooperative Education, a program of the Career Center, offers undergraduate and graduate students an opportunity to integrate classroom study with paid, career related work experience for academic credit. Work may be full or part time. Credit is granted through Continuing Education and awarded directly by the Cooperative Education program. A Cooperative Education experience may substantially improve students’ employment opportunities after graduation.

Degree Plan Proposal

The degree plan must be submitted to the Academic Policies/Program Review committee through the Office of the Director of University Studies by guideline due dates (October 1 for spring or summer graduation; February 1 for fall graduation). No fewer than 15 credits must be proposed (remain to be taken after approval) and included in the proposal. Students who submit proposals after the due date will not be considered for graduation the following semester. Students are encouraged to submit their proposals during the junior year with approximately 30 credits proposed.

A program must include the following: at least one semester (15 credits) of study to be completed after approval; a total of no fewer than 122 credits (including credit for military experience, previous college work, work experience, etc.), 37 credits of junior- and senior-level courses (300-400 level); a cumulative grade-point average of 2.00 based on all work completed at North Dakota State University; 60 credits from a four-year institution; and the residency requirement (36 credits must be completed at North Dakota State University). Ordinarily, the last 30 credits must be resident credits. In addition, each program must fulfill the General Education requirements including the Capstone Experience, Cultural Diversity, and Global Perspectives categories and have as a minimum the following:

Requirements Credits
First-Year Experience 1
Communications (C):

COMM 110, Fund Public Speaking 3
ENGL 110a, 120, College Composition I, II 6
ENGL Upper Level Writing Course 3
Quantitative Reasoning 3
Science & Technology 10
Humanities & Fine Arts 6
Social & Behavioral Sciences 6
Wellness 2
Capstone 1
Total 47

Approval of a student’s proposal means that everybody involved believes that the approved plan is the best educational program available to that student and that it is a baccalaureate-level program.

It is the policy of the College of University Studies that students seeking a B.U.S. degree will, following approval of the B.U.S. proposal, be expected to make continual progress toward completion of their degree. Discontinuing enrollment for a period of two continuous academic years or more indicates lack of progress. The proposals of students who lack progress will no longer be considered valid for graduation with a B.U.S. degree. If these students choose to continue to seek a B.U.S. degree, it will be necessary to submit a new proposal for consideration by the committee.

In addition to the College of University Studies continual progress policy, NDSU requires that any student who discontinues enrollment for more than one year subject to completing the General Education requirements in effect at the time of re-entry. B.U.S. proposals are subject to the NDSU baccalaureate degree requirements.

For further information, contact:
Carolyn A. Schnell, Associate Dean
College of University Studies
112 Morrill Hall
North Dakota State University
Fargo, ND 58105
Telephone: 231-7014
www.ndsu.edu/univ_studies
Interdisciplinary Programs

INTERDISCIPLINARY PROGRAMS

Interdisciplinary study involves an integration of more than one discipline and perspective on a topic. North Dakota State University offers several interdisciplinary programs at both the undergraduate and graduate levels. The undergraduate programs listed in this section are offered through collaborative partnerships of departments in more than one academic college. Programs offered by multiple departments within the same academic college are listed in their respective college sections.

Biotechnology
www.ndsu.nodak.edu/plantsci

Biotechnology is an interdisciplinary field based on a combination of biology and technology. It includes the application of science and technology to the design of new plants, animals, and microorganisms that have improved characteristics. The methodologies include the use of recombinant DNA for gene cloning and gene transfers between organisms, culture of plant and animal cells and tissues, fusion of animal cells or plant protoplasts, and the regeneration of whole plants from single cells.

Biotechnology also is concerned with the large-scale fermentation processes that utilize some of these novel organisms for the production of pharmaceuticals, diagnostic tests for diseases, feed additives, enzymes, and hormones.

Biotechnology offers seemingly unlimited opportunities to combine genes from related or unrelated species to produce useful organisms with desirable properties that were not previously found in nature. The development of crop plants that are resistant to herbicides or insects, the production of human growth hormone and insulin by genetically engineered bacteria, and the development of unique vaccines are all examples of successful biotechnology.

The Biotechnology program is offered in either the College of Agriculture, Food Systems, and Natural Resources or the College of Science and Mathematics and leads to the Bachelor of Science degree. The curriculum is designed to provide students with knowledge and experience in both basic and applied sciences. Students have an opportunity to work with scientists in various areas including, animal science, biology, botany, chemistry, horticulture, microbiology, plant pathology, plant science, and zoology. Faculty in each of the cooperating life-science departments has been identified to serve as advisors for students who select the biotechnology major.

Graduates of this program have excellent opportunities for employment in the biotechnology industry or for graduate education. Students majoring in biotechnology are required to perform a research project in the laboratory of a faculty member/scientist, and to prepare a senior thesis describing their research project. A 2.50 institutional grade-point average is required to remain in the program.

Sample '08-'09 Curriculum

Biotechnology Major

General Education Requirements Credits
First Year Experience (F):
UNIV 189, Skills for Academic Success .................1
Communications (C):
COMM 110, Fund of Public Speaking ....................3
ENGL 110a, 120, College Composition I, II .............6
ENGL Upper Level Writing Course2 .....................3
Quantitative Reasoning (R):
STAT 330, Intro Stats ..................................3
Science & Technology (S):
BIOL 150, 150L, Gen Biology I, Lab ................. 3,1
CHEM 121, 121L, Gen Chemistry I, Lab .............. 3,1
CHEM 122, 122L, Gen Chemistry I, Lab .............. 3,1
Humanities & Fine Arts (A) .......................... 6
Social & Behavioral Sciences (B) .............. 6
Wellness (W) ...................................... 2
Cultural Diversity (D) ................................. 3
Global Perspective (G) 3 ................................--
Total .................................................. 42

Major Requirements Credits
BIOC 151, 151L, Gen Biology II & Lab ............... 3,1
CHEM 341, 341L, Organic Chemistry I/Lab .......... 3,1
CHEM 432, Organic Chemistry II .................... 3
MATH 146, 147, Applied Calculus I, II .............. 4,4
MICR 350, 350L, Gen Microbiology & Lab .......... 3,1
MICR 470, Basic Immunology ........................ 3
MICR 471, Immunology & Serology Lab .......... 2
MICR 482, Bacterial Genetics & Phage .............. 3
PHYS 211, 211L, College Physics I & Lab .......... 3,1
PHYS 212, 212L, College Physics II & Lab ........ 3,1
PLSC 315, 315L, Genetics & Lab .................... 3,1
BIOC 466, Found of Biochemistry & Molecular Biology I, II ................................. 8
BIOC 465, Prin of Physical Chem/Biophysics ... 4
BIOC 474, Meth in Recombinant DNA Tech ....... 3
BOT 380, Plant Physiology or ZOO 460, Animal Physiology ................. 4
Biotechnology Electives2 ............................ 4-6
Biotechnology Seminar ............................... 2
Senior Research ................................... 2-4
Senior Thesis ..................................... 1
Total .................................................. 71-75

Additional Requirements Credits
Advisory Electives ......................................6
CSCI Elective .........................................3
Electives ........................................... 15
Total ................................................... 75

Curriculum Total ........................................ 128-132

Sample '08-'09 Curriculum

Biotechnology Minor

Requirements Credits
BIOC 460, Found of Bioche & Molec Bio I ...........4
BIOC 461, Found of Bioche & Molec Bio II .........4
PLSC 315, 315L, Genetics & Lab .................... 3,1
Biotechnology Technical Electives3 ............................ 4
Specialized Electives4 ................................2
Total ................................................... 22

1 Refer to department or curriculum guide for course options.
2 Refer to department or curriculum guide for course options.

Note: Students must meet the university’s general education requirements as well as the curriculum requirements in effect at the time of entrance into a program.

Biotechnology Minor

A minor in biotechnology requires satisfactory completion of 22 credits in the following courses. A minimum of eight credits must be taken at NDSU.

Sample '08-'09 Curriculum

Biotechnology Minor

Requirements Credits
BIOC 460, Found of Bioche & Molec Bio I ...........4
BIOC 461, Found of Bioche & Molec Bio II .........4
PLSC 315, 315L, Genetics & Lab .................... 3,1
Biotechnology Technical Electives3 ............................ 4
Specialized Electives4 ................................2
Total ................................................... 22

1 Refer to department or curriculum guide for course options.
**Fraud Investigation**

The Department of Accounting and Information Systems, in collaboration with the Department of Criminal Justice and Political Science, offers a minor in Fraud Investigation. Students will study the causes of fraud, as well as the detection, investigation, and prevention of fraud. Students learn about the criminal justice system including law making, criminality, and prosecution of fraud and other types of crime. This minor will prepare students for possible careers in crime investigation, litigation support, or forensic accounting.

Contact the Department of Accounting and Information Systems or the Department of Criminal Justice and Political Science for specific course and minimum grade-point average requirements.

**Gerontology**

A minor in Gerontology is sponsored through the College of Human Development and Education and the College of Arts, Humanities and Social Sciences. It makes use of the Tri College University resources to provide students with an integrated understanding of the process of aging, aging services, and the aged in America. There are six basic areas of study. Students should follow the directions provided for each of the areas.

**Sample '08-09 Curriculum Gerontology Minor**

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 440, Sociology of Aging</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 460, Adult Development &amp; Aging or PSYC 471, The Psychology of Aging</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 182, Wellness &amp; Aging</td>
<td>3</td>
</tr>
<tr>
<td>CDFS 481, Women &amp; Aging or CDFS 482, Family Dynamics of Aging</td>
<td>3</td>
</tr>
<tr>
<td>Internship</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Curriculum Total (min) | 18

1. Each student must complete the equivalent of three semester credits of internship-practicum. Please contact Dr. Dan Klemow or Dr. Greg Sanders for details. Students who have completed an internship-related to Gerontology for their current major can request to substitute those credits for the required 3 credit elective.

2. Refer to department or curriculum guide for course options.

**Great Plains Institute of Food Safety**

www.ndsu.edu/foodsafety

An interdisciplinary team of faculty with expertise in food safety from various departments within NDSU’s Colleges of: Agriculture, Food Systems, and Natural Resources; Arts, Humanities and Social Sciences; Human Development and Education; Engineering and Architecture, and Science and Mathematics has formed the Great Plains Institute of Food Safety and developed a unique educational experience for NDSU students. The comprehensive food safety curriculum leads to B.S., M.S., and Ph.D. degrees in Food Safety, an Undergraduate Minor in Food Safety and a Graduate Certificate in Food Protection (see website for complete curriculum requirements). All these programs are unified around the single issue of food safety, an area of concern for many Americans, the current target of tremendous interest, effort, and spending worldwide, and an area in which shortages of expertise are manifest. Students in food safety are heavily recruited for employment in the food safety fields.

The curriculum is based on contemporary educational theory and employs experiential learning techniques to foster development of students’ critical-thinking abilities, collaborative and problem-solving skills, and awareness of employment opportunities. Courses are fully integrated so that students have the opportunity to trouble-shoot food-safety issues from “farm-to-fork.” The program promises to meet students’ present and future educational needs.

**Sample '08-09 Curriculum Food Safety Major**

<table>
<thead>
<tr>
<th>General Education Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F): AGR199, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C): COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110I, 120, College Composition I, II</td>
<td>6</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Course (R): STAT 330, Intro Stats</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (Q): Science &amp; Technology (S): BIOL 150, 150L, Gen Biology I, Lab</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121, 121L, Gen Chemistry I, Lab</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 122, 122L, Gen Chemistry I, Lab</td>
<td>3</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B): ECON 201, Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 202, Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D')</td>
<td>--</td>
</tr>
<tr>
<td>Global Perspective (G)</td>
<td>--</td>
</tr>
<tr>
<td>ECON 201, Principles of Microeconomics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total** | 42

**Major Requirements**

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR1 50, Ag Orientation</td>
</tr>
<tr>
<td>ANSC 340, Meat Science &amp; Technology</td>
</tr>
<tr>
<td>CFS 200, Intro to Food Systems or CFS, 210 Intro to Food Sci &amp; Tech</td>
</tr>
<tr>
<td>CFS 460, 461, Food Chemistry, Lab or CFS 464, Food Analysis</td>
</tr>
<tr>
<td>CFS 370, Food Processing I or CFS 470, 471, Food Processing II, Lab</td>
</tr>
<tr>
<td>MICR 350, 350L, Gen Microbiology I, Lab</td>
</tr>
<tr>
<td>SAFE 401, Food Safety Info &amp; Flow of Food</td>
</tr>
<tr>
<td>SAFE 402, Foodborne Hazards</td>
</tr>
<tr>
<td>SAFE 403, Food Safety Risk Assessment</td>
</tr>
<tr>
<td>SAFE 404, Epidemic of Foodborne Illness</td>
</tr>
<tr>
<td>SAFE 405, Costs of Food Safety</td>
</tr>
<tr>
<td>SAFE 406, Food Safety Crisis Comm</td>
</tr>
<tr>
<td>SAFE 407, Food Safety Risk Management</td>
</tr>
<tr>
<td>SAFE 408, Food Safety Regulatory Issues</td>
</tr>
<tr>
<td>SAFE 409, Food Safety Risk Comm &amp; Educ</td>
</tr>
<tr>
<td>SAFE Electives</td>
</tr>
</tbody>
</table>

**Curriculum Total** | 16

1. Refer to department or curriculum guide for course options.

**International Studies**

The International Studies minor is a secondary major that is offered concurrently with a student’s primary program of study. This program provides students with the opportunity to internationalize their major by combining special requirements to obtain the international studies major with their academic field of study. Students complete 27 credits of course work including an integrative senior project, demonstrate proficiency in a foreign language, and participate in an experience abroad to complete a second major in International Studies.

**Courses.** In addition to the courses required for the primary major, students seeking the International Studies major are required to take courses that have an international focus. These include a 12-credit core and nine credits of electives that will be chosen with the help of the student’s advisor. An integrative senior project that ties international study to the primary degree also is required.
Languages. Knowledge of a foreign language is an important part of the program. At NDSU students may study Arabic, French, German, and Spanish. Additional language study is available through the Tri-College University in languages such as Norwegian, Russian, Japanese, and Chinese. Foreign language proficiency equivalent to completion of two years of college language study is required. This requirement may be met either through appropriate course work or through a testing procedure in the Department of Modern Languages.

Experience abroad. An important part of the International Studies major is participation in a study, work, or research experience abroad for at least 10 weeks in duration. Assistance with finding an overseas study program is available in the Office of International Programs.

Selective admission. To be eligible to participate in the International Studies major, students must have sophomore standing with a minimum grade-point average of 2.5. Eligible students also must have initiated advanced level course work in their academic major and completed the first year or equivalent of their foreign language study. Additional information about the International Studies major and curriculum requirements are available through the Department of Modern Languages, and the Office of International Programs.

Logistics Management

Working in conjunction, the College of Business, the Department of Agribusiness and Applied Economics offer a minor in Logistics Management. Companies directly involved with transportation as well as companies in the retail and wholesale sectors increasingly rely on an effective and efficient logistics system to remain competitive. In addition, the public sector also utilizes individuals with logistics and supply chain management skills.

Sample '08-09 Curriculum Logistics Management Minor

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN 350, Foundations of Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 481, Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN 491, Seminar</td>
<td>1</td>
</tr>
<tr>
<td>AGE 378, Intro to Transportation &amp; Logistics</td>
<td>3</td>
</tr>
<tr>
<td>IME 470, Operations Research I</td>
<td>3</td>
</tr>
<tr>
<td>IME 480, Production &amp; Inventory Control</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Curriculum Total: 19

In addition, students must earn a 2.50 cumulative grade-point average based upon the courses used in the minor. A minor approval form and fee are required.

Natural Resources Management

www.ag.ndsu.nodak.edu/nrm

With increasing human pressure and a growing need to balance competing demands, our world needs new and better ways to manage society's impacts on the environment. The Natural Resources Management program prepares students for challenging careers requiring the holistic ecological perspective and global social perspective necessary for examining and solving complex natural resources management problems. Our goal is the highest and best societal uses of natural resources while maintaining the integrity of life-sustaining ecological systems. Career opportunities abound in federal, state and local government, the private sector, non-profit conservation and environmental organizations, as well as higher education and research.

An interdisciplinary major in NRM leads to a Bachelor of Science (BS) degree. Students benefit from faculty engagement from four colleges in the coordination of the program, classroom teaching and advising. Students may earn a B.S. degree from any one of the participating colleges: College of Agriculture, Food Systems, and Natural Resources; College of Engineering and Architecture; and College of Science and Mathematics.

During the first four semesters of the NRM program, students complete a broad foundation of core courses in the social, biological, and physical sciences. The second half of the program offers students the opportunity to focus on a specific area of interest (emphasis). NRM offers six emphasis areas, each allowing students the flexibility to select courses for specialized career preparation.

Biotic Resources Science deals with basic scientific principles that govern the interaction between biotic (e.g., plants, animals) and abiotic factors (e.g., climate, soils) in major ecosystems and the use of these principles for environmentally sound management of both natural and agro-ecosystems.

Environmental Communication is designed for environmentally oriented students preparing for careers in communication fields such as journalism, public relations, broadcast media and the internet.

Natural Resources Economics prepares students for management, administrative, regulatory, and policy positions that require a broad understanding of natural resources management and allocation.

Physical/Earth Resources Science leads to an understanding of the physical and chemical aspects of ecosystems. Topics of study include hydrology, water management and quality, waste management, soil properties, energy resources and land-use management.

Pollution Control focuses on the principles and practices of managing natural resources for pollution control. Topics include the technical aspects of pollution as they relate to water, air/solids, earth/solids, and the impact of environmental pollution on biotic factors. Students interested in this emphasis are strongly urged to complete College Algebra before entering the NRM program.

Social Sciences concentrates on human factors (social, political, anthropological) in environmental management and environmental disaster management, while recognizing constraints and opportunities presented by physical and biological factors.

Sample '08-09 Curriculum

Natural Resources Management Major

<table>
<thead>
<tr>
<th>General Education Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td>1</td>
</tr>
<tr>
<td>AGRI 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td>3</td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, College Composition I, II</td>
<td>6</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R):</td>
<td>3</td>
</tr>
<tr>
<td>STAT 330, Intro Stats</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S):</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 111, Concepts of Biology, Lab</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 124, Environmental Science</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 105, Physical Geography</td>
<td>3</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A):</td>
<td>6</td>
</tr>
<tr>
<td>Social &amp; Behavioral Sciences (B):</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 111, Concepts of Biology, Lab</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 110, Intro to Political Science</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110, Intro to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>Wellness (W):</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D):</td>
<td>3</td>
</tr>
<tr>
<td>Global Perspective (G):</td>
<td>--</td>
</tr>
<tr>
<td>GEOL 105, Physical Geography</td>
<td>--</td>
</tr>
</tbody>
</table>

Total Credits: 40

Major Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRM 150, NRM Orientation</td>
</tr>
<tr>
<td>NRM 225, Natural Resources/Agro-Ecology</td>
</tr>
<tr>
<td>SOIL 210, Intro to Soil Science</td>
</tr>
<tr>
<td>BIOL 151, 151L, General Biology II, Lab</td>
</tr>
<tr>
<td>CHEM 117, 117L, Chem Concepts &amp; Appl</td>
</tr>
<tr>
<td>BIOL 364, General Ecology</td>
</tr>
<tr>
<td>CHEM 121, Gen Chemistry I, Lab</td>
</tr>
<tr>
<td>NRM 264, Nat Resource Mgmt Sys</td>
</tr>
<tr>
<td>ECON 481, Nat Resource Economics</td>
</tr>
<tr>
<td>POLS 215, Prob/Policies in Amer Govt</td>
</tr>
<tr>
<td>POLS 360, Prin of Public Admin</td>
</tr>
<tr>
<td>POLS 422, State &amp; Local Politics</td>
</tr>
<tr>
<td>HIST 333, US Environmental History</td>
</tr>
<tr>
<td>HIST 434, Hist of Environmental Science</td>
</tr>
</tbody>
</table>

Additional Requirements

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 110, Intro to Sociology &amp; Sociology</td>
</tr>
<tr>
<td>SOC 431, Environmental Sociology</td>
</tr>
<tr>
<td>POLS 110, Intro to Political Science</td>
</tr>
<tr>
<td>POLS 453, Environ. Policy &amp; Politics</td>
</tr>
<tr>
<td>Free Electives</td>
</tr>
</tbody>
</table>

Total Credits: 76

In addition, students must earn a 2.50 cumulative grade-point average based upon the courses used in the minor. A minor approval form and fee are required.

1 Effective fall 2007, students with composite ACT scores of 21 or higher may be eligible to register for English 110. Students with composite ACT scores of less than 21 are required to register for English 110
2 Refer to department or curriculum guide for course options.
3 May double count with Select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed Courses.
Natural Resources Management Minor

Students may minor in NRM by completing a minimum of 18 credits. Six of those credits are required courses and an additional three credits from each of the following interdisciplinary categories is also required: Biotic Resources Science, Physical/Earth Science, and the Social Sciences Sections I and II. A minimum of eight credits must be taken at NDSU. A minor approval form is available from the NRM Student Services Office.

Sample '08-'09 Curriculum

Natural Resources Management Minor

Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRM 150, NRM Orientation</td>
<td>1</td>
</tr>
<tr>
<td>NRM 225, Nat Resources/Agro-Ecosystems</td>
<td>3</td>
</tr>
<tr>
<td>NRM 431, NEPA &amp; Env Impact ASMNT</td>
<td>2</td>
</tr>
<tr>
<td>Interdisciplinary Courses1</td>
<td>12</td>
</tr>
</tbody>
</table>

Curriculum Total ........................................... 18

Women’s Studies

www.ndsu.edu/womens_studies

The goals of Women's Studies include:
Examining the contributions of women to all aspects of society; exploring the intersections of race, class, sexual orientation, age, and physical ability with gender both globally and nationally; investigating the heritage, challenges and concerns of women; and providing a newer and broader understanding of women in all fields.

A Women's Studies program provides the benefits of a liberal arts education with an emphasis on critical thinking, writing, and organizational skills, making oral presentations, and expands the traditional acknowledgement that a liberal education produces well-rounded individuals. There also are multiple practical applications of a Women’s Studies major. With more women in the workplace, businesses must be able to address issues such as sexual harassment, flex-time, and equal opportunity not only with sensitivity but from a knowledge base.

Women's Studies Major

The major consists of 36 credits, including a 15 credit core, nine hours of general Women's Studies elective classes, and 12 hours of topic-intensive work. (Women and Liberal Arts, Women and Families, Women and Health, Women and Work, and Women and Public Policy). Many of the courses in the topic-intensive electives are at Concordia College and MSUM.

Sample '08-'09 Curriculum

Women’s Studies Major

General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Experience (F):</td>
<td></td>
</tr>
<tr>
<td>UNIV 189, Skills for Academic Success</td>
<td>1</td>
</tr>
<tr>
<td>Communications (C):</td>
<td></td>
</tr>
<tr>
<td>COMM 110, Fund of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1101, 120, College Composition I,II</td>
<td>6</td>
</tr>
<tr>
<td>ENGL Upper Level Writing Course2</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning (R)</td>
<td>3</td>
</tr>
<tr>
<td>Science &amp; Technology (S)</td>
<td>10</td>
</tr>
<tr>
<td>Humanities &amp; Fine Arts (A)</td>
<td>6</td>
</tr>
<tr>
<td>Including: Soc 412, Sociology of Sex Roles</td>
<td></td>
</tr>
<tr>
<td>Wellness (W)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural Diversity (D)</td>
<td></td>
</tr>
<tr>
<td>WS 110, Intro to Women's Studies</td>
<td></td>
</tr>
<tr>
<td>Global Perspective (G)2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

College/Department Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Fine Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>AHSS Elective (outside of major area)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
</tr>
</tbody>
</table>

Major Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS 350, Perspectives in Women's Studies</td>
<td>3</td>
</tr>
<tr>
<td>WS 489, Internship/Capstone</td>
<td>3</td>
</tr>
<tr>
<td>SOC 424, Feminist Theory &amp; Discourse</td>
<td>3</td>
</tr>
<tr>
<td>WS Electives1</td>
<td>9</td>
</tr>
<tr>
<td>Topic Electives1</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

Additional Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Electives (for degree completion)</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

Curriculum Total (min) ................................ 122

1 Refer to department or curriculum guide for course options.

Women’s Studies Minor

The Women's Studies minor is an interdisciplinary program appropriate as a complement to various majors. This minor is particularly useful in acquiring perspectives that complement traditional studies for developing leadership roles or for pursuing careers that involve women's concerns. A student selecting this minor must complete the following requirements:

Sample '08-'09 Curriculum

Women’s Studies Minor

Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS 110, Intro to Women's Studies</td>
<td>3</td>
</tr>
<tr>
<td>Core Courses1</td>
<td>9</td>
</tr>
<tr>
<td>Electives1</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
</tr>
</tbody>
</table>

At least three credits must be taken in each of the two colleges offering the minor – the College of Arts, Humanities and Social Sciences and the College of Human Development and Education.

Interdisciplinary Programs

1 Refer to department or curriculum guide for course options.
2 Refer to department or curriculum guide for course options.
3 May double count with Select Humanities & Fine Arts, Social & Behavioral Science and/or Science & Tech Gen Ed Courses.
The Graduate School presents advanced programs leading to the Master of Science, Master of Arts, Master of Business Administration, Master of Education, Master of Music, Master of Architecture, Master of Military Logistics, Master of Accountancy, Education Specialist, Doctor of Musical Arts, Doctor of Education, Doctor of Nursing Practice, and Doctor of Philosophy degrees. Graduate certificates may also be earned. Graduate degrees offered and subject matter fields are listed at the end of this section. For more complete details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin.

The Graduate School offers superior students the opportunity to develop their capabilities in given areas. Graduate study is particularly recommended for those students whose interests and aptitudes carry them beyond routine application. Graduate students are encouraged to develop powers of independent thought and to become familiar with the conduct of research.

The Graduate School extends and enlarges the work of the undergraduate programs and supports specialized training, research, and scholarly expression.

Graduate programs are administered by the graduate dean assisted by a Graduate Council composed of six elected and six appointed faculty members, and two appointed graduate students.

Admission to Graduate Study
The Graduate School encourages applicants to apply to graduate programs using the electronic application (www.ndsu.edu/gradschool/apply). Every applicant must complete an application form, as well as a Reasons for Graduate Study Statement, and return it to the Graduate School. Arrangements must be made for official transcripts of all previous course work to be sent to the Graduate School. Additionally, the applicant should indicate the names of three individuals who will provide letters of reference. Some departments require Graduate Record Examination (GRE) scores. Education and Counseling and Guidance may require scores on the Miller Analogies Test (MAT) or the Graduate Record Examination (GRE). Applications to the Master of Business Administration program must include Graduate Management Admission Test (GMAT) scores.

Processing time requires that international student applications must be received by the Graduate School prior to May 1 for Fall Semester and prior to August 1 for Spring Semester.

Admission to the Graduate School is open to qualified graduates of universities and colleges of recognized standing without regard to age, race, color, gender, sexual orientation, religion, national origin, disability, or Vietnam-era veteran status. Admission to the Graduate School is a selective process intended to identify applicants who are outstanding among recipients of baccalaureate degrees.

The following minimum qualifications are required of all students seeking an advanced degree:
1. The applicant must have a baccalaureate degree from an educational institution of recognized standing.
2. The applicant must have adequate preparation in the chosen field of study and must show potential to undertake advanced study and research, as evidenced by academic performance and experience.
3. At the baccalaureate level, the applicant must have earned a cumulative grade-point average in all courses of at least 3.0, or equivalent, to attain full standing in a graduate degree program. Students with a previous graduate degree for which the GPA was at least 3.0, or equivalent, may be admitted in full standing.
4. Each department or program may set higher qualifications and may require the submission of additional evidence of academic performance.

A student is permitted to register for graduate courses only after formal admission. Departments or programs make recommendations on all applications, but the final admission decision is the responsibility of the graduate dean.

Registration Procedure
For first-time registration, consult with the department chair or designee, or your major advisor and complete the necessary forms for on-site registration. Thereafter, consult with an advisor in advance of registration to plan courses to meet your degree requirements.

Fees for Graduate Students
Fees are listed in the section titled Student Financial Information and Services.

General Requirements for Master's Degrees
Minimum requirements for all master's degrees include the following items:

Supervisory Committee
The student, with the approval of the department/program chair, will select a major advisor. The major advisor-student relationship must be mutually acceptable. The major advisor will act as the chair of the student's supervisory committee and will be in charge of the Plan of Study. In addition to the major advisor, two additional members must be agreed upon by the advisor and student. One of these members must be from the faculty. The other member may be either a faculty member or a qualified off-campus expert in the field, depending upon the department. A fourth committee member serves as a Graduate School appointee.

The student and major advisor, in consultation with all other supervisory committee members, will develop a tentative Plan of Study, consisting of not fewer than 30 graduate semester credits. The Plan of Study must bear the signatures of the supervisory committee and be approved by the chair of the major department, the academic dean, and the graduate dean before it is official. It may be revised as advisable and necessary but must be filed with the Graduate School not later than the term immediately after the supervisory committee is formed. Revisions may be made later but must be approved by the student, all supervisory committee members, the chair of the student's department, and the graduate dean.

The supervisory committee is encouraged to convene at least once per semester and meet at least once per year to review the progress of the student's graduate program.

Number of Credit Hours
Candidates for the master's degree are required to earn a minimum total of 30 credits in appropriate and approved 600- and 700-level courses.

Residence Requirement
No degree is given without at least one full year of academic work in residence. The residence requirement may be met by residence at the institution for two full semesters on a full-time basis. Part-time students earn residence in proportion to the number of credits earned.
Transfer of Credit

All graduate credits used to meet the requirements of a master's degree must be approved by the supervisory committee, the department/program chair, the academic dean, and the graduate dean. A candidate for the master's degree must petition in order to transfer up to a maximum of nine (9) semester hours of graduate credit from another institution to satisfy course requirements on the Plan of Study.

Note: Educational Leadership Program course requirements taken through Tri-College are not considered transfer credits and may be included on Plans of Study without petition. All other graduate credits earned through Tri-College University are considered transfer credits.

Time Limitation

All requirements for the master's degree must be completed within a period of seven (7) consecutive years. Graduate credit for any course work that is more than seven calendar years old at the time of the final examination may not be used to satisfy degree requirements.

Final Examination

Candidates earning a M.S. or M.A. degree shall pass a final examination before being awarded the master's degree. The supervisory committee shall serve as the examining committee of which the major advisor shall serve as chair. Committee member substitutions must be approved by the graduate dean.

The final examination shall cover course work taken by the candidate, the thesis, paper, or other activity (e.g., portfolio), and knowledge fundamental thereto. The final examination shall be held and passed before the student can participate in commencement.

Degree Requirements

Master of Science

The Master of Science (M.S.) degree is offered in two options: Thesis Option (available in all departments) or Comprehensive Study Option (not available in all departments). The Thesis Option emphasis is on research and ability to analyze data and to prepare a scholarly thesis, whereas the Comprehensive Study Option emphasis is on a broader understanding of a major area.

In those departments offering both options, the choice should be made jointly by the student and the major advisor, based upon the nature of the responsibilities for which the student is preparing.

Under the guidance of the major advisor, each candidate shall prepare a thesis or paper to be approved by the chair of the major department, all members of the supervisory committee, and the graduate dean. The thesis consists of no fewer than six (6) and no more than ten (10) credits toward the minimum 30 required credits. The paper contributes no fewer than two (2) and no more than four (4) credits toward the minimum 30 required credits. The thesis or paper bearing the approval of the major advisor, other supervisory committee members, and the department chair, are to be presented, unbound, to the Graduate School. Two bound copies of the thesis or paper go the university Library. The remaining three bound copies are for the student, the student's advisor, and student's department.

Master of Arts

Candidates for the Master of Arts (M.A.) degree will meet the preceding general requirements and those specific requirements in the humanities, and social and behavioral sciences departments that offer the M.A. degree. The additional requirements normally include two years of a foreign language.

Master of Business Administration

The Master of Business Administration (M.B.A.) degree is a non-disquisition, professional degree program structured to serve qualified students with any undergraduate degree.

Master of Education

The Master of Education (M.Ed.) degree is a non-disquisition, practitioner-oriented degree for teachers and school counselors. Candidates for this degree will meet the preceding general requirements as well as specific requirements established by the School of Education.

Master of Music

The Master of Music (M.M.) is the professional master's degree in music designed for (1) performers, conductors, and music industry professionals wishing to augment and refine their skills, (2) music teachers wishing to update and increase their knowledge, especially in content areas of performance and/or conducting, and (3) those wishing to teach music at the college level. Two tracks are offered: Performance and Conducting. Each requires a minimum of 30 credits. Students in the D.M.A. program may receive the M.M. after completion of all requirements, and all work taken in the M.M. may apply to parallel tracks in the D.M.A.

Master of Architecture Degree

The Master of Architecture (M.Arch.) is the professional degree for architects wishing to enter the profession. The M.Arch. requires 30 graduate credits in the structured architecture curriculum beyond the four-year pre-professional Bachelor of Science in Environmental Design degree offered at NDSU.

Master of Military Logistics

The M.M.L. is a professional degree program targeted specifically at career military officers and Department of Defense (DoD) civilians. The degree is tailored to meet DoD’s strategic goals of joint officer development and logistics transformation.

The M.M.L. in Transportation and Logistics allows students, who are selected by DoD and NDSU, to develop advanced knowledge and research skills. The key emphasis areas are: joint military logistics and transportation, advanced supply chain management, integration of technology with supply-chain and enterprise resource planning, and the integration of homeland security and crisis management issues with military logistics. The M.M.L. degree program provides students with a comprehensive integrated knowledge of joint military logistics and transportation, which will enable them to be successful in the ever-changing field of military operations.

Master of Science, Master of Education, and Education Specialist in Educational Leadership

Candidates for the Master of Science, Master of Education, and Education Specialist in Educational Leadership degrees will meet the requirements established by the Tri-College University Educational Leadership program. Additional information outlining these requirements is available on request from the College of Graduate and Interdisciplinary Studies.

Doctor of Philosophy

Only a brief summary of the requirements for the Ph.D. degree is listed. (For details, see the Graduate Bulletin online at www.ndsu.edu/gradschool/bulletin) The Doctor of Philosophy degree is awarded in recognition of high scholarly attainment as evidenced by a period of successful advanced study, the satisfactory completion of certain prescribed examinations, and the development of an acceptable dissertation covering some significant aspect of a major field of learning.

Plan of Study and Supervisory Committee

See this section under General Requirements for the master's degree. The minimum number of semester credits is 90. Thirty (30) of them may be satisfied with a previous master's degree.

Residence Requirement

Graduate study for the Doctor of Philosophy degree normally requires a minimum of three (3) years of full-time study beyond the baccalaureate degree. A student who has a master's degree or equivalent must devote at least one of the two remaining academic years of study in residence at North Dakota State University.

Time Limitation

All requirements for the Doctor of Philosophy degree must be completed within a period of 10 consecutive years. Graduate credit for any course work, not included in the master's degree that is more than 10 calendar years old at the time of the final examination may not be used to satisfy degree requirements.

Language Requirements

Each graduate department will determine whether it will require a language and, if so, the language or languages applicable to the candidate's field of study and the level of reading proficiency required. Low-level proficiency will measure the candidate's comprehension of material in the major field in the foreign language with unlimited use of linguistic reference sources (e.g., dictionaries, glossaries, etc.); high-level proficiency will measure a similar reading comprehension with limited use of such reference sources. All examinations will be administered under the supervision of the Department of Modern Languages. International students whose native language is not English may satisfy the language requirement in their native language, providing their graduate department approves. In these cases, the basis for proficiency will be the candidate's use of English, rather than the foreign language. The certificate testifying to proficiency in the foreign language must be filed with the graduate dean before the student may be admitted to the comprehensive/preliminary examination in those cases where the department requires a foreign language.
Examinations
Comprehensive /Preliminary Examination: This examination will be required of each student after the greater portion of courses has been completed and any required language proficiency has been certified. The examination consists of both written and oral parts. After passing the comprehensive/preliminary examination, the student will be formally admitted to candidacy for the Doctor of Philosophy degree. At least one academic semester must elapse between the comprehensive/preliminary examination and the final examination.

Final Examination
This examination will be taken after the candidate has completed the course work and dissertation. This is an oral examination that is concerned primarily with the dissertation, but may also include material from course work, especially courses fundamental to the dissertation.

Dissertation
The dissertation must show originality and demonstrate the student’s capacity for independent research. It must embody results of research that constitute a definitive contribution to knowledge.

Doctor of Education
The Doctor of Education (Ed.D.) degree requires extensive field service involving qualitative and/or quantitative research, leading to a dissertation that will apply a theory at an institution (application of theory). This is a professional degree designed to meet the pragmatic expectations in the field of education.

Doctor of Musical Arts
The Doctor of Musical Arts (D.M.A.) is the terminal professional practical degree in music, designed for performers and conductors wishing to acquire the highest performance abilities. Graduates will have attained the academic qualifications generally accepted for teaching at the college level. Two tracks are offered: Performance and Conducting. Each track requires a minimum of 90 credits beyond the baccalaureate degree (93 for the D.M.A. in choral conducting). Students entering the program with an approved master’s degree or its equivalent may apply credits toward the D.M.A. The graduate music faculty will determine the viability and number of transfer credits.

Doctor of Nursing Practice
The D.N.P. is the professional nursing degree for advanced nursing practice, designed for registered nurses desiring to provide advanced nursing care for clients. Graduates will have met academic and clinical practice requirements for national certification as a nurse practitioner or clinical nurse specialist.

General Regulations
The following rules pertain to all graduate programs of study at NDSU:

Scholastic Standards
Graduate study demands a substantially greater effort on the part of the student than undergraduate study. The graduate student must maintain an overall average of B or better in all courses taken as a graduate student. Grades lower than C will not be accepted for graduate credit. Thesis, paper, and dissertation grades will be recorded as satisfactory or unsatisfactory.

Credit Courses
Courses approved at the 600 and 700 level may be taken for graduate credit and used to satisfy course requirements on the graduate Plan of Study. Courses that a student has used to fulfill the requirements of a baccalaureate degree may not be used on that student’s graduate Plan of Study.

Credit Load
A full-time graduate load is nine (9) credits. Graduate assistants in half-time status (0.5 FTE) are considered full time if registered for four (4) or more graduate credits. Graduate students wishing to register for more than twelve (12) credits in a regular semester shall secure the approval of their academic dean and the graduate dean.

Graduate Study by Faculty Members
A member of the faculty may not receive an advanced degree or certificate from the department in which they hold an appointment.

Individualized Plans of Study
To be most effective, graduate study must provide for the individual interests, needs, and abilities and should not be subject to rigid, detailed regulation. Therefore, the graduate dean is authorized to consider each case according to the recommendations of the program committee.

Graduate Degrees Granted
Degrees offered are Master of Science, Master of Arts, Master of Education, Master of Business Administration, Master of Music, Master of Architecture, Master of Military Logistics, Education Specialist, Doctor of Musical Arts, Doctor of Education, Doctor of Nursing Practice, and Doctor of Philosophy. Graduate certificates also are available.

The following programs of study are offered at the master’s degree level:

Accountancy (fall 2009)
Agricultural and Applied Economics
Agricultural and Biosystems Engineering
Agricultural Education
Animal and Range Sciences
Architecture
Biochemistry
Business Administration
Cereal Science
Chemistry
Child Development and Family Science
Civil Engineering
Coatings and Polymetric Materials
Community Development
Computer Science
Construction Management
Counseling
Criminal Justice
Counseling
Education
Educational Leadership
Electrical and Computer Engineering
Emergency Management
English
Entomology
Environmental and Conservation Science
Environmental Engineering
Family and Consumer Sciences Education
Food Safety
Genomics and Bioinformatics
Health, Nutrition and Exercise Science
History
Horticulture

Industrial Engineering and Management
International Agribusiness
Manufacturing Engineering
Mass Communication
Mathematics
Mechanical Engineering
Merchandising
Microbiology
Music
Natural Resources Management
Nursing
Pharmaceutical Sciences
Physics
Plant Pathology
Plant Sciences
Psychology
Social Science
Sociology
Software Engineering
Soil Science
Speech Communication
Statistics, Applied
Transportation and Logistics
Zoology

The Education Specialist degree may be earned in Educational Leadership through the Tri-College University.

The following programs of study are offered at the doctoral degree level:

Agricultural and Biosystems Engineering
Animal and Range Sciences
Biochemistry
Botany
Cellular and Molecular Biology
Cereal Science
Chemistry
Civil Engineering
Coatings and Polymetric Materials
Communication
Computer Science
Criminal Justice
Education (Ed.D, PhD)
Electrical and Computer Engineering
Emergency Management
Engineering
Entomology
Environmental and Conservation Science
Food Safety
Genomics and Bioinformatics
History
Human Development
Industrial and Manufacturing Engineering
Materials and Nanotechnology
Mathematics
Mechanical Engineering
Molecular Pathogenesis
Music (DMA)
Natural Resources Management
Nursing Practice, Advanced (DNP)
Pharmaceutical Sciences
Physics
Plant Pathology
Plant Sciences
Psychology
Science, Technology, Engineering & Mathematics
(STEM) Education (pending approval)
Software Engineering
Soil Science
Statistics
Transportation and Logistics
Zoology
COURSE DESCRIPTIONS
Courses approved at the time of publication are listed in this bulletin. Not all courses are offered every term. Refer to the online schedule of courses each term and Campus Connection for listed offerings.

Definitions
Course descriptions frequently include additional information about enrollment. Students are responsible for complying with restrictions or expectations related to course enrollment listed herein or in any supplementary information.

Course credits: Credits are stated in semester units as defined in the Academic Policies section in this bulletin.

Course prerequisites (Prereq): Prerequisites indicate the academic background, academic level, or other requirements considered necessary for enrollment in the course. Most prerequisites are specific courses, however, equivalent preparation is usually acceptable.

Course corequisites (Coreq): Corequisites indicate courses to be taken concurrently with the course described. Instructor or department permission may override a prerequisite or corequisite.

Cross-listed courses: A cross-listed course means the same course is offered by two or more departments or under another course prefix. Cross-listed courses are noted and the full description appears under the department responsible for the course. Credit may only be earned for the course under one of the prefixes.

Dual-listed courses: Dual-listed courses with 400- or 500- and 600-level course numbers permit undergraduate and graduate students in the same class. The same amount of credit for the course is earned by all students, but additional work is required of students enrolled under the graduate level number. Credit may only be earned for the course at one of the levels.

Designators
• (CCN) - This abbreviation indicates the course has a common number, title, and description throughout ND University System institutions. Common courses offered at NDSU are listed in the Appendix.

- (ND: ___) - This designator has various abbreviations following the colon to indicate the general education category for which the course has been approved by the ND University System for transfer to other System institutions. General Education Requirement Transfer Agreement (GERTA) designators are the following: (ND: COMPS) computer science, (ND: ENGL) English composition, (ND: FA) fine arts activities, (ND: HIST) history, (ND: HUM) humanities, (ND: LABSC) laboratory science, (ND: MATH) mathematics, (ND: SCI) science and technology, (ND: COMM) speech, and (ND: SS) social science. For more GERTA information, refer to the Academic Policies section in this bulletin.

Note: NDSU general education requirements and approved courses are available in Academic Policies in this bulletin, and online at www.ndsu.edu/registrar.

Format of Course Listings
All university course offerings, listed alphabetically by areas of study, are described on the following pages. Course information and course availability is subject to change. The heading, which precedes the brief description of each course, includes the current course number; former course number, if any, in brackets; course title; a CCN indicator, if any; and the number of semester credit hours, fixed or variable. Enrollment information, such as prerequisites and corequisites follows. The frequency the course is offered may appear at the end of the description. F = Fall, S = Spring, SS = Summer Session. Terms presented in a fraction indicate course is offered alternate years. F/2 = every other Fall Semester.

Course Numbers
Course numbers indicate the student classification for which the course is primarily intended. Some course numbers end with a letter suffix: L - laboratory course; R - recitation (undergraduate) or research continuation (graduate); S - graduate project. The number system is as follows:

100 series courses - open to freshmen
200 series courses - primarily for sophomores
300 series courses - primarily for juniors
400 series courses - primarily for seniors
500-599 series courses - post-baccalaureate professional courses
600 numbered courses - Continuing Education post-baccalaureate courses, not applicable toward graduate degrees
601-699 series courses - graduate courses taught concurrently in the same classroom with advanced undergraduates at the 400 or 500 level
700-799 series courses - open to graduate students

Notes: A bracketed course number or prefix [ ] indicates that the number or prefix of the same course has changed since the last publication of the bulletin. Double credit cannot be earned by repeating a course unless the course description indicates otherwise.

Graduate standing is required for 600-700 level courses unless prior approval to use the course for an undergraduate program of study is granted by the department/instructor.

Uniform Course Numbers
The following courses may be offered by departments but are described here because of their uniform numbers and descriptions.

(Seminar) 291, 391, 491 (CCN); 590, 690, 790
Seminar 1-5
A group of students engaged, under a professor or professors, in research or criticism and in presentation of reports pertaining thereto.

(Study Abroad) 292, 392, 492
Study Abroad 1-15
Pre-arranged study at accredited foreign institutions or in approved study abroad programs. Prereq: Sophomore standing and prior approval by major department. Graded P or F.

(Individual Study) 194, 294, 394, 494 (CCN)
Individual Study 1-5
Individual student work on research or criticism under the supervision of a professor.

Field Experience 1-15
Field-oriented supervised learning activities outside the college classroom that include a preplanned assessment of the experience, registration during the term the experience is conducted, and post evaluation with the instructor. Departmental approval.

Cooperative Education 1-4
Practical application of classroom learning through employment in supervised career-related positions. Students are granted full-time student status by the university regardless of the actual credit hours. Requires departmental approval and Co-op Program application.

Special Topics 1-5
A group study of the known and established literature of a field, or other evidence, for purposes of scholarly development.

Study Tour Abroad 1-6
NDSU faculty directed, part-term experience or field study in a foreign country. Conducted in English for residence credit. Prereq: Prior approval by the Office of International Programs and major department. May be repeated. Graded P or F.

Case Studies 1-3
Critical review, analysis, and evaluation of selected topics by individual presentations and group discussions. Case study topics are indicated by title on the student's transcript. Graded S or U.

Individual Study/Tutorial 1-5
Directed study allowing an individual student under faculty supervision to undertake selected, independent work in topics of special interest or a limited experience in research. Requires departmental approval.

Practicum/Internship 1-8
Course designed to provide practical participation under professional supervision in selected situations to gain experience in the application of concepts, principles, and theories related to the student's area of specialization. Requires approved program and consent of instructor. Graded S or U.

Temporary/Trial Topics 1-5
University-wide course focused on group study involving critical examination and discussion of subject matter selected for proposal as a temporary or trial course.

Master's Paper 1-3
Literature review, research, and preparation for paper required for the comprehensive study option. Graded S or U.

Paper Continued Registration 1-3
Continued registration for graduate paper. Only for students in a department/program with a limit on enrollment for paper credits. Graded S or U.
(Prefix) 797S
Comprehensive Project 1-6
An in-depth research study/project in a graduate student’s field of study. Prereq: Graduate standing.

(Prefix) 798
Master’s Thesis 1-10
Original investigation under the supervision of a major adviser and a supervisory committee. Graded S or U.

(Prefix) 798R
Thesis Continued Registration 1-3
Continued registration for graduate thesis. Only for students in a department/program with a limit on enrollment for thesis credits. Graded S or U.

(Prefix) 798S
Specialist Field Study 1-6

(Prefix) 799
Doctoral Dissertation 1-15
Original investigation under the supervision of a major adviser and an advisory committee. Graded S or U.

(Prefix) 799R
Dissertation Continued Registration 1-3
Continued registration for graduate dissertation. Only for students in a department/program with a limit on enrollment for dissertation credits. Graded S or U.

ACCOUNTING (ACCT)

Bowlin, Head; Andersen, Clifton, Dietz, Dowdell, Glatt, Jorgenson, Klaum, Olsen, Snyder

COURSES

(All courses 300 level and above require a minimum of junior standing.)

102 Fundamentals of Accounting (CCN) 3
Introduces financial statements and other accounting information to make personal and business decisions. Not available to majors and accounting minors in the College of Business Administration.

200 Elements of Accounting I (CCN) 3
Study of the basic concepts of accounting applied to businesses and the use of accounting information as a basis for decision-making. The focus is on financial accounting. Prereq: Sophomore standing. Coreq: CSCI 116.

201 Elements of Accounting II (CCN) 3
Study of the basic concepts of accounting applied to businesses and the use of accounting information as a basis for decision-making. The focus is on managerial accounting. Prereq: ACCT 200.

Minimum grade of “B” is required in ACCT 200, ACCT 201, or the equivalent course in transfer, to enroll in 300-400 level accounting courses.

311, 312 Intermediate Accounting I, II 4 each
Intensive study of accounting theories, corporate accounting problems, financial statements and disclosures, problems in income determination, and other evolving issues in accounting. Prereq: ACCT 201, 311 respectively.

318 Taxation in Management Decisions 3
Study of the fundamental concepts of tax implications that result from common business transactions. Prereq: ACCT 102 or 201. Cross-listed with BUSN.

320 Cost Management Systems 3
Study of cost management methods used to assign costs, and plan and evaluate business activities. Prereq: ACCT 201.

321 Government and Not-for-Profit Accounting 3
Study of accounting standards and procedures applicable to government and not-for-profit institutions. Prereq: ACCT 201. Recommended: ACCT 311.

342 Fundamentals of Financial Planning 3
Introduction to the concepts of personal financial planning: investing, budgeting, insurance, taxes, retirement and estate planning. Prereq: ACCT 201.

410/610 Fraud Examination 3
Study of the pervasiveness and causes of fraud in society; examination of methods of fraud detection and prevention, and on the investigation of financial statement fraud. Prereq: ACCT 201.

411/611 Advanced Fraud Examination 3
Advanced application of fraud examination principles that encompass the investigation and prevention of fraudulent financial transactions. Coursework is focused on the analysis of fraudulent financial statements and fieldwork involving actual organizations. Prereq: ACCT 410.

413 Accounting Internship 3
Supervised professional experience in a non-paid position. May be repeated.

415/615 Advanced Accounting 3
Study of advanced topics including consolidated statements, international operations, and derivative financial instruments. Prereq: ACCT 312.

418/618 Tax Accounting I 3
Study of the theory and principles related to the determination of taxable income and computation of federal income taxes for individuals. Students will prepare manual and computerized tax returns. Prereq: ACCT 201.

419/619 Tax Accounting II 3
Study of the theory and principles related to the determination of taxable income and computation of federal income taxes for partnerships, corporations, trusts and estates, and other specialized tax issues. Prereq: ACCT 418/618.

420/620 Accounting Information Systems 3
Study of conceptual and practical aspects of accounting information systems with a focus on business processes. Practical application includes use of software in a lab setting. Prereq: MIS 370. For 420: ACCT 311. For 620: ACCT 312.

421/621 Auditing I 3
Study of audit principles and practices including evidence gathering, internal controls, sampling and testing, report writing, ethics and legal liabilities. Prereq: ACCT 312.

422/622 Auditing II 3
Advanced application of audit principles in organizational situations through case studies and the investigation of current issues in auditing. Prereq: ACCT 421/621.

430 Tax Practice and Research 3

440/640 Management Control Systems 3
Study of the role of management analysts in the design, implementation, and use of management control systems. Prereq: ACCT 320.

720 Strategic Cost Management 3
Study of management’s use of cost management methods to plan and evaluate business activities.

735 Applied Professional Research 3
This course will emphasize substantive accounting questions and issues that arise in practice. Professional research methods will be used to solve cases addressing these questions. Teamwork, communication skills, and analytical skills required of contemporary accounting practitioners will be developed. Prereq: ACCT 311, 312 and 320.

750 Accounting Theory 3
This course will examine the conceptual underpinnings of accounting, the development of those concepts, and accounting issues as related to contemporary financial reporting. Prereq: ACCT 311, 312 and 320.

755 Financial Statement Analysis 3
This course is the study of conceptual and practical aspects of the financial information in corporate annual reports. The course focuses on the interpretation and critical evaluation of financial information, rather than the mechanics of preparing financial reports. Prereq: ACCT 311, 312 and 320.

AEROSPACE STUDIES (AS)

(AIR FORCE ROTC)

Williams, Chair; Baumgartner, Blackwell, Lamoreaux, Moon

COURSES

110 Air Force ROTC Fitness 1
Physical Training classes are designed to make students aware of the benefits of being physically fit and participating in lifetime fitness programs. May be repeated. F, S

111 The Air Force Today I 1
Introduces students to the United State Air Force and provides an overview of the basic character, missions, and organization of the Air Force. F

112 The Air Force Today II 1
Continuation of AS 111; provides an overview of the basic characteristics, missions and organization of the Air Force. S

210 Leadership Laboratory 1
Introduction to Air Force customs and courtesies, drill and ceremonies, and military structure. May be repeated. F, S

211 Evolution of USAF Air and Space Power I 1
Introduction to Air Force heritage and leaders, Air Force concepts, ethics and values, leadership, and the application of both oral and written communication skills. Course content covers air power history from 1783-1960. F

212 Evolution of USAF Air and Space Power II 1
Continuation of AS 211, includes an introduction to Air Force heritage and leaders, Air Force concepts, ethics and values, leadership, and the application of both oral and written communication skills. Prepares cadets for Field Training. Course content covers air power history from 1960 to the intermediate future. S
321 Air Force Leadership/Management I 3
Introduction to leadership and management within the USAF, in both theory and practical application emphasizing communication skills (in both oral and written Air Force formats) and interpersonal skills. F

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

410 Leadership Laboratory 1
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 with the cadet corps organization. May be repeated. F, S

441 Preparation for Active Duty I 3
A study of the national security process, regional studies, advanced leadership ethics and Air Force doctrine. Topics include the military as a profession, officer ethics, military justice, civilian control of the military, and current issues. Application of communication skills is included. F

442 Preparation for Active Duty II 3
A continuation of AS 441. Topics include the military as a profession, officer ethics, 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. S

AGRICULTURAL AND BIOSYSTEMS ENGINEERING (ABEN)
Backer; Chair, Bon, Bora, Jia, Panigrahi, Pryor, Rahman, Solseng, Steele, Wiesenborn

COURSES

110 Introduction to Agricultural and Biosystems Engineering 2
Introduction to the agricultural and biosystems engineering profession with emphasis on engineering problem solving. 2 lectures. F

189 Skills for Academic Success 1
See University Interdisciplinary Studies for description.

255 Computer-Aided Analysis and Design 3
Application and use of software for engineering design, analysis, and graphical communication. 2 one-hour-and-15-minute laboratories. F

263 Biological Materials Processing 3
Processing equipment design and physical properties of biological materials that influence their harvesting, handling, processing, storage, marketing, and quality evaluation. 2 lectures, 1 three-hour laboratory. Prereq: ABEN 255. S

358 Electric Energy Application in Agriculture 3
Electrical distribution/services. Electrical control units, solid state and digital electronics, electromagnetic sensors, and sensing techniques with applications to food, agricultural, and biological systems. 2 lectures, 1 three-hour laboratory. Prereq: PHYS 252. F

377 Numerical Modeling in Agricultural and Biosystems Engineering 3
Numerical modeling using finite element and other techniques. Engineering applications include modeling of stress/strain, heat, and mass transfer in physical, natural resource, and biological systems such as grain and food products. 3 lectures. Prereq: MATH 266, ME 223. S

383 Structural Design for Biosystems 3
Study of framing systems, building materials, and load requirements. Analysis and design of structures for biosystems. 3 lectures. Prereq: ME 223. F

444/644 Transport Processes 3
Energy and mass transport principles applied to biological and environmental systems. Prereq: MATH 266 and CE 309 or ME 352. S

452/652 Bioenvironmental Systems Design 3
Study of psychrometrics, heat and mass transfer, and physiological requirements for livestock and bioproducts. Design of environmental modifications, livestock wastes and control systems. 3 lectures. Prereq: CE 309, ME 350. F

458/658 Food Process Engineering 3
Analysis and design of food processing equipment and plants. Emphasis is on application of fluid flow, thermodynamics, and heat and mass transfer principles. 3 lectures. Prereq: Junior standing. F

464/664 Resource Conservation and Irrigation Engineering 4
Engineering principles and design of systems for soil and water resource management and environmental protection. 3 lectures, 1 three-hour laboratory. Prereq: CE 309. S

473/673 Agricultural Power 3
Theory, analysis, and testing of internal combustion engines, traction, power trains, hydraulic systems, vehicle dynamics, stability, and ergonomics in tractor design. Electrical power units including motors. Alternative energy systems. 2 lectures, 1 three-hour laboratory. Prereq: ME 350. F

478/678 Machinery Analysis and Design 3
Principles of design, development, and testing of agricultural machines and machine systems. Applications of computer aided design and FMEA. 3 lectures. Prereq: ME 223. S

479/679 Fluid Power Systems Design 3
See Mechanical Engineering for description.

482/682 Instrumentation and Measurements 3
Application of instrumentation and sensor concepts to measurement and control of environmental, biological, and mechanical parameters. Includes sensor principles, signal conditioning, data collection, and data analysis methods. 2 lectures, 1 three-hour laboratory. Prereq: ME 223, PHYS 252. S

486 Design Project I 2
Capstone learning experience involving principles of design, project management, and evaluation. Student teams define a capstone project in their area of interest. 1 lecture/laboratory. Prereq: Senior standing. F

487 Design Project II 2
Continuation and completion of the capstone learning experience begun in ABEN 486. Communication in oral, written, and graphic forms is emphasized. 2 lectures/labatories. Prereq: ABEN 486. S

758 Applied Computer Imaging and Sensing for Biosystems 3
Sensors and non-destructive sensing principles (e.g., computer vision, spectroscopy, imaging, fiber optic sensing) for bioproduction and processing applications. Data/signal acquisition, signal conditioning/analysis techniques, signal interpretation, and pattern recognition using statistical, neural networks, and fuzzy logic techniques.

763 Theory of Drying Biological Products 3
Theory used to describe the drying processes of biological products. 3 lectures. F

765 Small Watershed Hydrology and Modeling 3

773 Advanced Agricultural Power and Machinery 3
Theory and design of agricultural power units and field machines. 3 lectures. Prereq: ABEN 473/673. F

783 Advanced Structures and Environmental Systems 3
Detailed analysis of building components and advanced design problems relating to agricultural and environmental systems. 3 lectures. Prereq: ABEN 383. S

AGRICULTURAL ECONOMICS (AGEC)
Wahl, Chair; Aakre, Barber, Fahs, Gustafson, Hearne, Kim, Koo, Lambert, Leistritz, Mack, McKee, Miljkovic, Olson, Petry, Rathge, Szewonsky, Shaik, Swenson, Taylor, Tweeten, Wachenheim, Wilson

COURSES

150 Quantitative Economics 2
Application of algebra and calculus to price theory. 2 lectures. Prereq: MATH 103 or 107.

220 World Agricultural Development (CCN) 3
Introduction to theories, policies, and practices to increase food production and agricultural development in developing countries. 2 lectures. Prereq: ECON 201. (ND:SS)

242 Intro to Agricultural Management (CCN) 4
Economic and managerial concepts related to farm or agribusiness production process, development of cost data, enterprise analysis, organization and management of production inputs. 3 lectures, 1 laboratory.

244 Agricultural Marketing (CCN) 3
Study of the agricultural marketing system to include cash marketing, commodity futures trading, branded products merchandising and the interrelationship of the government and international trade. 3 lectures.

246 Introduction to Agricultural Finance I (CCN) 4
Introduction to agricultural finance; provides background in farm and agribusiness credit use and evaluation. Discussion of specific financial conditions on farms and in agribusinesses. 3 lectures, 1 laboratory.

339 Quantitative Methods and Decision Making 3
Application of basic probability concepts to decision analysis, introduction to linear programming models, and decision-tree analysis. 3 lectures. Prereq: ECON 201 and AGEC 150 or MATH 146.
Course Descriptions

342 Farm and Agribusiness Management II 3
Application of production economics principles to farm and agribusiness operations. Economic input-output principles and profit maximization. 2 lectures, 1 laboratory. Prereq: AGEC 242.

344 Agriculture Price Analysis 3
Introduction to price analysis in agricultural markets. 3 lectures. Prereq: AGEC 244.

346 Applied Risk Analysis 3
Development of tools to analyze business and financial risk problems unique to farms and agribusinesses. 3 lectures. Prereq: STAT 330.

347 Principles of Real Estate 3
Principles and techniques of real estate appraisals, practical application of appraisal principles, and techniques to real property evaluation. 3 lectures. Prereq: ECON 201. Cross-listed with BUSN.

350 AgriSales 3
The principles of salesmanship applied to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, and closing sales. 3 lectures.

360 International Agribusiness Experience 3
Provides students an applied context for analyzing international agribusiness. Students participate in a self- or pre-arranged experience and research an agribusiness topic in depth prior to and while studying in a foreign country.

374 Cooperatives 3
Theory, practice, and evaluation of cooperatives including principles, management, marketing, finance, taxes, legal issues, and adjusting to change. 2 lectures. Prereq: ECON 201. Cross-listed with BUSN.

375 Applied Agricultural Law (CCN) 3
Study of laws affecting agriculture and agribusiness including property ownership, financial relations, and environmental regulation. 3 lectures.

378 Introduction to Transportation and Logistics 3
Presents major analytical tools and methods used in analyzing logistical strategies. Course emphasis is on application of analytical tools used in quantifying logistical problems by manufacturing, trading, and shipping firms. Prereq: AGEC 378 and AGEC 339 or BUSN 352.

446/646 Agribusiness Finance 3
Application of financial theory to investment and liability management problems of agribusiness and farm firms. Characteristics, operations, and management of agricultural financial institutions. 3 lectures. Prereq: AGEC 339, 346.

450 National AgriMarketing Association (NAMA) I 1
Learn the components of an agribusiness marketing plan and apply this knowledge in the development of a marketing plan for a selected product. 1 lecture.

451 National AgriMarketing Assoc (NAMA) II 2
Review the components of an agribusiness marketing plan. Work in teams to prepare written and oral marketing plans for the National NAMA student chapter competition in April. 2 lectures.

452/652 Food Laws and Regulations 3
See Food Safety for description.

470/670 Agricultural Trade 2
Introduction to trade theory and policies and their applications to agricultural product trade. 2 lectures.

472/672 Advanced Logistical Analysis 3
Advanced logistical analysis. Prerequisite: MATH 146. Cross-listed with NRM.

484 Agricultural Policy 3

701 Research Philosophy 1
Role of the scientist, reasoning, values, and decisions. Problem formulation, literature review, hypothesis development, data collection, analysis, and interpretation. 1 lecture.

711 Advanced Topics in Econometrics 1-3
Advanced econometric methods appropriate to a variety of research areas in economics and agribusiness will be offered. Analytical methods covered will vary by semester. May be repeated. Prereq: AGEC 710.

720 Food Safety Costs and Benefits Analysis 3
See Food Safety for description.

725 Food Policy 3
See Food Safety for description.

739 Analytical Methods for Applied Economics 3
Study and application of operations research techniques and other decision methods to problems in agriculture, transportation, and resource management. 3 lectures. Prereq: MATH 146.

741 Advanced Microeconomics 3
Advanced analysis of demand, production, and costs; pricing output and resource allocation under various market structures. Prereq: ECON 341.

743 Advanced Macroeconomics 3
Advanced analysis of macroeconomic theories; economic growth, business fluctuations, and inflation. Prereq: ECON 343, MATH 146.

744 Agribusiness I: Agricultural Product Marketing and Agribusiness Strategy 3
Conceptual foundations of agribusiness strategy, food product marketing, and strategic planning are presented. Emphasis is placed on quantitative strategic decision making for the agribusiness firm.

746 Agribusiness II: Agrifinance and Commodity Trading 3
Conceptual foundations of agribusiness finance, trading, and strategy are presented. Emphasis is placed on financial instruments and planning for agribusiness firms and trading and risk management in agricultural commodities.

771 Economics of Transportation Systems 3
The course will provide an understanding of transportation economics and policy issues facing society. Topics include transportation demand, model costs, transportation competition and market power, transportation regulation, transportation investment, and the economics of transportation safety. Cross-listed with CE.

772 Rural Logistics and Distribution Management 3
Logistical systems and concepts, distribution management, management of railroads and motor carriers, and location of facilities. Includes agribusiness and natural resource case studies. Cross-listed with CE.

AGRICULTURAL SYSTEMS MANAGEMENT (ASM) 3
Backer, Chair; Bon, Jia, Panigrahi, Pryor, Solseng, Steele, Wiesenborn

COURSES 3

115 Fundamentals of Agricultural Systems Management (CCN) 3
Overview of agricultural systems management; engines, machinery, structures, electricity, processing, and conservation. 3 lectures. Coreq: MATH 103, 104, or 107.

125 Fabrication and Construction Technology (CCN) 3
Introduction to materials, methods, and tools used in fabrication, installation, and maintenance of agricultural production and processing facilities. 2 lectures, 1 three-hour laboratory.

225 Computer Applications in Agricultural Systems Management (CCN) 3
Application and use of software for problem solving, reporting, and graphical communication. 2 one-hour and 15 minute laboratories. Prereq: CSCI 114 or 116, MATH 105, 107, or 146.

259 Measurements in Natural Resource Systems 1
Surveying, data acquisition, area and volume determinations, and other measurement calculation techniques in planning and management of natural resource systems.

264 Natural Resource Management Systems (CCN) 3
General principles of management of natural resource systems including hydrology, soil erosion, irrigation, drainage, and water quality. 2 lectures, 1 three-hour laboratory. Prereq: MATH 103, 104, or 107. Cross-listed with NRM.

323 Post-Harvest Technology 3
Principles and management of crop and feed storage, handling, drying, processing, and crop/feed systems siting, planning, and development. 3 lectures. Prereq: MATH 103, 104, or 107.
**Course Descriptions**

### 354 Electricity and Electronic Applications (CCN) 3
Fundamentals and applications of electricity, power distribution, controls, motors, and solid-state electronics. For non-engineering majors. 2 lectures, 1 three-hour laboratory. Prereq: Junior standing, MATH 103, 104, or 107.

### 368 Structures and Environment Systems 3
Study of environmental needs of animals and bioproducts, control of building environments, construction materials, framing systems, and functional planning for biosystem structures. 3 lectures. Prereq: MATH 103, 104, or 107.

### 373 Tractors and Power Units (CCN) 3
Theory and principles of operation, use, maintenance, repair, and selection of tractors and power systems. Includes engines, transmissions, fuel, lubrication, hydraulics, traction, and electrical systems. 3 lectures. Prereq: MATH 103, 104, or 107.

### 374 Power Units Laboratory (CCN) 1
Laboratory to complement concepts introduced in ASM 373. Topics include engine systems, operation, adjustment, maintenance, repair, measurement, and testing. 1 three-hour laboratory. Prereq: MATH 103, 104, or 107.

### 378 Machinery Principles and Management (CCN) 3
Principles of agricultural machinery manufacture, sales, operation, and management. Topics include selection, replacement, operation, application, and maintenance. 2 lectures, 1 three-hour laboratory. Prereq: MATH 103, 104, or 107.

### 429 Hydraulic Power Principles and Applications 3
Study of fluid power principles, components, schematics, and systems. Emphasis is on proper use, maintenance, and applications of hydraulic power equipment. Prereq: PHYS 211, Junior standing.

### 454/654 Principles of Site Specific Agriculture 3
Principles and practices of site-specific farming, including data acquisition, data management, modeling, equipment management, GPS, and GIS. 2 lectures, 1 three-hour laboratory. Prereq: MATH 103, 104, or 107.

### 468 Golf Course Irrigation I 2
See Plant Sciences for description.

### 469 Golf Course Irrigation II 1
See Plant Sciences for description.

### 473/675 Management of Agricultural Systems 2
Capstone learning experience involving team problem solving in agricultural systems management. Oral and written communications are emphasized. 2 lectures. Prereq: Senior standing.

### AGRICULTURE (AGRI)

**Dean, Grafton**

<table>
<thead>
<tr>
<th>COURSES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>103 Introduction to Agricultural Communication</strong> 3</td>
<td>An introduction to key issues in agricultural communication. The course focuses on the creation and critical consumption of messages in the context of agriculture. Cross-listed with COMM.</td>
</tr>
</tbody>
</table>

### 150 Agriculture Orientation (CCN) 1
Introduction to opportunities and professional advancement in agricultural careers. Overview of majors offered in the College of Agriculture, Food Systems, and Natural Resources, activities, and support services.

### 189 Skills for Academic Success (CCN) 1
See University Interdisciplinary Studies for description.

### ANIMAL SCIENCE (ANSC) [ARSC]

**Buchanan, Head; Anderson, Bauer, Eric Berg, Erika Berg, P. Berg, Berryhill, Caton, Colville, Danielson, Dodds, Eck, Graziul-Bilska, Hammer, Havve, Lardy, Luther, Maddock, Maddock-Carlín, Moore, Park, Redmer, Reynolds, Schroeder, Stokka, Stoltenow, Swanloss, Taylor, Vonahme, Wagner**

<table>
<thead>
<tr>
<th>COURSES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>114 Introduction to Animal Sciences (CCN) 3</strong></td>
<td>General principles of the livestock industry and relationships to mankind. 2 lectures, 1 two-hour laboratory.</td>
</tr>
<tr>
<td><strong>123 Feeds and Feeding (CCN) 3</strong></td>
<td>Principles of feeding livestock including digestive systems, nutrient requirements, nutrient characteristics, and sources utilized in the formulation of balanced rations. 2 lectures, 1 two-hour laboratory.</td>
</tr>
<tr>
<td><strong>210 Introduction to Therapeutic Horsemanship 3</strong></td>
<td>This course will introduce students to perspectives of disabilities, how equine assisted activities may affect individuals with specific disabilities, how to select appropriate horses and adaptive equipment, and will include discussion on the history and current discipline of therapeutic horsemanship and related fields. F</td>
</tr>
<tr>
<td><strong>220 Livestock Production (CCN) 3</strong></td>
<td>General production and management of major meat and dairy animal species. Topics include production systems, feeding, facilities, health, economics, and marketing. 2 lectures, 1 two-hour laboratory.</td>
</tr>
<tr>
<td><strong>222 Meat Animal Evaluation (CCN) 2</strong></td>
<td>Relationship between live animal composition and meat product values. Introduction to basic muscle biology and effects of livestock practices on meat quality. 2 two-hour laboratories. F</td>
</tr>
<tr>
<td><strong>260 Introduction to Equine Studies (CCN) 2</strong></td>
<td>Introduction to basic aspects of equine studies and general principles surrounding the horse industry. 2 one-hour lectures. F</td>
</tr>
<tr>
<td><strong>260L Equine Care and Management Practicum (CCN) 1</strong></td>
<td>A laboratory course designed to supplement lecture material covered in ANSC 260. Students will learn management and husbandry skills relevant to modern horse care practices. 1 three-hour laboratory. Correq: ANSC 260. F</td>
</tr>
<tr>
<td><strong>261 Basic Equitation and Horsemanship 1</strong></td>
<td>Basic grooming, saddling, bridling, mounting, ground work, correct riding position and proper coordination of the riding aids will be addressed. Horse behavior will also be discussed throughout the course. 1 two-hour laboratory. Lab fee required. Enrollment priority will be given to Equine Studies Major/Minor/Certificate students.</td>
</tr>
<tr>
<td><strong>263 Introduction to Animal Biotechnology 3</strong></td>
<td>Basic aspects of animal biotechnology, biotechnology in health, biotechnology in reproduction, biotechniques. 3 lectures. Prereq: BIOL 126 or 150. S</td>
</tr>
<tr>
<td><strong>301 Principles of Therapeutic Horsemanship Instruction 3</strong></td>
<td>This course is focused on theoretical knowledge and application of therapeutic horsemanship instruction through experiential learning and teaching techniques of peers, and includes evaluation and training techniques for therapy horses, lesson plan development, and critical reviews of the literature. Prereq: ANSC 210. S</td>
</tr>
<tr>
<td><strong>320 Dairy Cattle Selection 1-2</strong></td>
<td>Visual appraisal, selection, and evaluation of dairy cattle. Type classification of dairy cattle. 2 three-hour laboratories. May be repeated.</td>
</tr>
<tr>
<td><strong>323 Fundamentals of Nutrition 3</strong></td>
<td>Fundamentals of nutrition emphasizing digestion, metabolism, function, requirements, and sources of specific nutrients. 3 lectures. Prereq: ANSC 123, BIOC 260. S</td>
</tr>
<tr>
<td><strong>330 Meat Selection, Grading, and Judging 1-2</strong></td>
<td>Evaluation and grading of carcasses and wholesale cuts of beef, pork, and lamb. Written explanation of decisions and comparisons. 2 three-hour laboratories. May be repeated. Prereq: ANSC 222.</td>
</tr>
<tr>
<td><strong>331 Livestock Selection (CCN) 1-2</strong></td>
<td>Visual and performance evaluation of breeding and slaughter classes of the major meat producing livestock. 2-3 three-hour laboratories. May be repeated. Prereq: ANSC 222.</td>
</tr>
<tr>
<td><strong>340 Meat Science and Technology 2</strong></td>
<td>Chemical and physical relationships of meat and meat products. Identification, nutritive analysis, preservation, cooking, and packaging technology. 2 lectures, 1 two-hour laboratory. Prereq: CHEM 260.</td>
</tr>
<tr>
<td><strong>344 Fundamentals of Meat Processing 3</strong></td>
<td>Chemical and physical relationships in meat preservation, sausage production, and other meat product preparation. 1 lecture, 1 three-hour laboratory.</td>
</tr>
<tr>
<td><strong>357 Animal Genetics 3</strong></td>
<td>Genetic and statistical principles applied to livestock improvement. 2 lectures, 1 two-hour laboratory. Prereq: PLSC 315, STAT 330. S</td>
</tr>
<tr>
<td><strong>360 Equine Nutrition 3</strong></td>
<td>This course focuses on basic equine nutrition fundamentals while integrating concepts in an applied and practical manner. Prereq: ANSC 123. S</td>
</tr>
<tr>
<td><strong>361 Intermediate Horsemanship 1</strong></td>
<td>A continuation of ANSC 261. Further emphasis will be placed on development of the balanced seat and coordinated aids necessary to complete more advanced maneuvers. 1 two-hour laboratory. Lab fee required. Enrollment priority will be given to Equine Studies Major/Minor/Certificate students. Prereq: ANSC 261.</td>
</tr>
<tr>
<td><strong>362 Colts in Training 2</strong></td>
<td>Principles and application of techniques required to train a young horse to ride. Three two-hour laboratories. Enrollment priority will be given to equine studies major/minor students.</td>
</tr>
<tr>
<td><strong>364 Equine Anatomy and Physiology 3</strong></td>
<td>This course focuses on a practical understanding of equine anatomy and physiology as they relate to management, conditioning, and reproduction. Prereq: VETS 135.</td>
</tr>
<tr>
<td><strong>365 Equine Evaluation 2</strong></td>
<td>Detailed study of horse conformation, selection criteria, and judging standards for equine competitions. Emphasis</td>
</tr>
</tbody>
</table>
will be placed on critical thinking, decision making, and oral presentation skills. 2 three-hour laboratories. May be repeated. Prereq: ANSC 260. F, S.

375 Methods of Horsemanship Instruction 2
In this experiential learning course, students will study methods of instruction, lesson plan development, and demonstrate integration of their knowledge through practical teaching situations, both mounted and unmounted. Prereq: ANSC 261, 361.

410 Therapeutic Horsemanship Teaching Practicum 1
In this practical teaching course, students will team teach for 6 to 12 weeks with a North American Riding for the Handicapped Association (NARHA) certified instructor at a local therapeutic program, assisting with lesson plan and program plan development, mounting and dismounting of riders, as well as instruction and evaluation of riders. Prereq: ANSC 210, 310.

435/635 Nutrition Laboratory Techniques 3
Theory and laboratory techniques associated with nutritional research and current information regarding advanced techniques and developments. 2 lectures, laboratory by arrangement. Prereq: CHEM 260. F (even years)

461 Advanced Horsemanship and Equitation 1
This course is designed to further the skills obtained in ANSC 361. Riders will be exposed to advanced technical and theoretical knowledge of Western and Hunt seat equitation and horsemanship. More intensive study and development of the skills required for advanced maneuvers will be covered. 1 two-hour laboratory. Lab fee required. Enrollment priority will be given to Equine Studies Major/Minor/Certificate students. Prereq: ANSC 361.

463/663 Physiology of Reproduction 3
Comparative anatomy, physiology, and endocrinology of reproduction in mammals. Cross-listed with ZOO.

463L/663L Physiology of Reproduction Laboratory 1
Anatomy, physiology and demonstration and utilization of techniques in large animal reproductive management. Cross-listed with ZOO. Prereq: ANSC 463.

464 Reproductive Management Procedures 2
Demonstration and utilization of the new technology in large animal reproductive management including embryo and semen collection, pregnancy diagnosis, and estrous control. 1 lecture, 1 three-hour laboratory. Prereq: ANSC 463. F

466 Principles of Feed Production 2
This course is a comprehensive introduction to feed production technology; the science of feeds, feeding, feed additives and feed optimization; and management and legal aspects in providing quality livestock, poultry, aquaculture and companion animal feeds. Prereq: ANSC 123.

470 Applied Nutrition 4
Application of nutrition principles in feed management systems for livestock with emphasis on energy and protein (ruminants) and energy and amino acids (non-ruminants). 4 lectures. Prereq: ANSC 323. S

480 Equine Industry and Production Systems 3
A capstone course that incorporates genetics, nutrition, exercise physiology, reproduction, health care, and industry practices into management of the equine enterprise. 2 lectures, 1 two-hour laboratory. Prereq: ANSC 363, 463. F

482 Sheep Industry and Production Systems 2
Capstone course to include the management, systems, selection, record keeping, merchandising, and production testing of sheep. 3 lectures, 1 two-hour laboratory. Prereq: ANSC 220, 336, 357, 463, 470. Half semester.

484 Swine Industry and Production Systems 2
Capstone course includes breeding systems, disease control, applied economics, housing, marketing, and nutrition in a systems approach. 3 lectures, 2 one-hour laboratory. Prereq: ANSC 220, 357, 463, 470. Half semester.

486 Beef Industry and Production Systems 2
Capstone course includes the management, systems, selection, record keeping, merchandising, and production testing of beef. 3 lectures, 1 two-hour laboratory. Prereq: ANSC 220, 336, 357, 463, 470. Half semester.

488 Dairy Industry and Production Systems 2
Capstone course includes the management, selection, record keeping, merchandising, and production testing of dairy and dairy products. 2 lectures, 1 two-hour laboratory. Prereq: ANSC 220, 357, 463, 470. Half semester.

721 Biology of Lactation 2
Mammary gland development and mechanisms controlling lactation. 2 lectures. Prereq: BIOL 460.

728 Advanced Reproductive Biology 3
Discussion of reproductive physiology research with emphasis on current topics in cellular and molecular biology. 3 lectures. Prereq: ANSC 463, BIOL 460. F (odd years)

730 Growth Biology 3
Regulation of growth at the cell/tissue, organ system, and whole animal levels. 3 lectures. Prereq: ANSC 463, BIOL 460. Cross-listed with BIOL. S (even years)

736 Experimental Nutrition Methods 1
Design, conductance, analysis, and reporting of experiments taken in conjunction with ANSC 773, 774, 775, or 776. Prereq: ANSC 470, BIOL 460.

740 Data Analyses and Designs of Experiments 3
Experimental design principles, introductory statistical theory, and commonly used data analyses of animal and range science data are taught and practiced with practical applications using the computer. 3 lectures. Prereq: STAT 725.

755 Advanced Meat Science 3
An in-depth investigation of the physical and biochemical characteristics of muscle and meat. Students will gain an understanding of advanced meat science topics, and improve their ability to design, conduct, interpret and report meat science research. Prereq: ANSC 340, BIOL 460. (even years)

773 Energy Metabolism 3
Methods of measuring energy values and the metabolic processes involved in the production of useful biological energy from organic compounds. 3 lectures. Prereq: ANSC 470, BIOL 701. F (odd years)

774 Nitrogen Metabolism 3
Detailed overview of nitrogenous compounds including metabolism and function. Considerable emphasis on current research from the literature. 3 lectures. Prereq: ANSC 470, BIOL 701. S (even years)

775 Vitamins and Minerals 3
Metabolism of vitamins and minerals and their application in animal nutrition and the feed industry. 3 lectures. Prereq: ANSC 470, BIOL 701. F (even years)

776 Digestive Physiology 3
Investigation of digestive and absorptive events occurring within farm animals. Emphasis on enzyme action, nutrient transport, gut motility, gastrointestinal endocrinology, and current research. 3 lectures. Prereq: ANSC 470, BIOL 701. F (odd years)

ANTHROPOLOGY (ANTH)
Klenow, Chair: Clark, Gill-Robinson, Kitch, Kloberdanz, Riley, Sather-Wagstaff

COURSES

111 Introduction to Anthropology (CCN) 3
Introductory overview of the major divisions of anthropology: cultural and physical anthropology, archaeology, and linguistics. (ND:SS)

204 Archaeology and Prehistory 3
Introduction to archaeological methods, followed by a survey of world prehistory.

205 Human Origins 3
Examination of the evolution of humans through the investigation of fundamental principles of evolution, human variation, comparative primate behavior, and the fossil record.

206 Peoples of the World 3
General survey of cultural anthropology and cultures of various regions of the world.

208 Folklore and Culture 3
Examination of folk traditions (oral, customary, and material) within their cultural context.

209 Introduction to Linguistics 3
See English for description.

432/632 Human Osteology 3
The analysis of human bones. Areas of study include skeletal anatomy, human biological individualization and interpretation of archaeological and paleontological skeletal material. Prereq: ANTH 111, 204, 205.

433/663 Apes and Human Evolution 3
A laboratory-oriented survey of living primates describing and comparing the diverse behavioral and morphological adaptations of great apes in a human evolutionary context. Prereq: ANTH 111, 204, 205.

444/664 Peoples of the Pacific Islands 3
General survey of cultures, past and present, in Melanesia, Polynesia, and Micronesia.

446/646 Current Problems in Paleoanthropology 3
This course is a critical inquiry and survey of biologicallyanthropology. It allows students to construct our ancestors’ past using evidence from paleoanthropology, archaeology, geology, ecology, zoology, and comparative primate morphology. Prereq: ANTH 111, 204, 205.

450/650 Cultural Anthropology 3
Examination of the nature of culture, the dynamics of culture, cultural subsystems, and cultural data collection and analysis. Prereq: ANTH 111.
452/652 North American Indians

General survey of native North American Indian cultures. Focuses on cultural systems as anthropologists have reconstructed them for the pre-contact period.

453/653 Magic and Religion

Comparative religion, religious concepts, practices, and practitioners. In-depth study of selected religious systems with a focus on shamanic religions. Prereq: ANTH 111. Cross-listed with RELS.

458/658 Indians of the Plains

Ethnographic/ethno-historical survey of major Indian tribes in the Great American Plains region from ancient times to the present.

461/661 Germans from Russia

Study of the cultural and historical background of an important ethnic group in the Great American Plains region—German-speaking people from Russia.

462/662 Cultural Ecology

Analysis of the systematic relationship between human populations and their ecological surroundings. Prereq: Any ANTH course.

464/664 Disaster and Culture

Examines human-made and natural disasters through cross-cultural and historical perspectives. Addresses cultural variation across and within relevant communities including those of disaster victims, emergency management systems, and a broad public. Prereq: Junior or Senior standing. Cross-listed with EMGT.

465/665 Web-based Media in Anthropology

This course focuses on the use of modern computer imaging techniques within an anthropology research context. Topics to be covered include: visual anthropology, cultural preservation, data protection, ethics, web 3-D, digital video, web-design and Internet dissemination.

480/680 Development of Anthropological Theory

Focus on major theoretical orientations in anthropology. Emphasis on the ways in which anthropological theories are used to generate explanations for multicultural phenomena. Prereq: ANTH 111.

489 Senior Capstone in Anthropology

Synthesis of social research methods, anthropological theory, and sub-discipline content material. Emphasis on integrative skills needed to interrelate the basic concepts of the discipline. Prereq: Senior standing.

705 Forensic Anthropology

Theory and methods in the recovery, identification, and evaluation of human skeletal remains for criminal investigation purposes.

APPAREL, DESIGN AND HOSPITALITY MANAGEMENT (ADHM) [ADFH]

Bastow-Shoop, Head; Braaten, Hirani, Jha, Lee, Manikowske, Phillips, Ragan, Ray-Degges, Richardson, Sunderlin, Wilkening, Wolfe

COURSES

101 Beginning Apparel Construction

Introduction to basic apparel assembly methods and use of a sewing machine.
Developing original patterns through flat pattern design in all prereq courses. Coreq: ADHM 368, 460. S

372 Global Retailing
Theoretical approach to management practices and marketing policies for retail soft goods in a complex and changing world market. Prereq: 2.5 cumulative GPA, junior standing and BUSN 360, 362, or ADHM 171. Cross-listed with BUSN.

370 Sewn-Product Manufacturing and Analysis
Analysis of the sewn-product manufacturing processes, governmental regulations, sourcing, and technology applications. Focus on evaluating products' quality, performance, and cost. Prereq: ADHM 366 or 367. S

368 Interior Materials and Maintenance
3

363 Commercial Lighting Design and Building Systems
Integration of theory, techniques, and the art of lighting design with emphasis on commercial applications. Analysis of commercial building systems. Prereq: Interior Design major. Coreq: ADHM 351, 365, 366, 367 with a grade of C or higher in all prereq courses. F

360 Front Office Management
Front office procedures; reservations, selling strategies, handling guest inquiries, and night audit functions. Computer application is highlighted. Prereq: ADHM 140, 141. S

356 Pattern Drafting and Grading
Individual and commercial apparel patterns are created with the pattern drafting method. Grading, a system of making a range of sizes for a master pattern, is examined. Prereq: ADHM 155. S

355 Flat Pattern Design and Draping
Developing original patterns through flat pattern design and draping for individual and commercial applications. Prereq: ADHM 155. S

353 Interior Design Studio V: Large Scale Contract Design
Application of design components to a large scale commercial project with emphasis on special populations and design focus. Prereq: Interior Design major. Prereq: ADHM 254 with a grade of C or higher in all prereq courses. Coreq: ADHM 362, 363. F

352 Commercial Interior Design
Application of design components to an advanced residential interior. Prereq: ADHM 140, 141, BUSN 360. S

351 Interiors Design Studio IV: Advanced Residential
Application of design components to an advanced residential project with emphasis on special populations and design focus. Prereq: Interior Design major. Prereq: ADHM 254 with a grade of C or higher in all prereq courses. Coreq: ADHM 362, 363. F

347 Hospitality Law
Legal considerations of hospitality property management and exploration of important legislation. Legal rights, liabilities and responsibilities of the operator in conjunction with management policies. Prereq: Senior standing. F

346 Career Development and Professional Practice
Overview of professional standards and promotional activities as related to the interior design profession. Coreq: ADHM 353, 368. S

345/645 Advanced Apparel Assembly
Application of principles and concepts of advanced apparel assembly to finished products. Prototype development and advanced dressmaking techniques applied to clothing for men, women, and children. Prereq: ADHM 155.

343 Food and World Cultures
An integrated approach to the study of foods and cultures. Food influences on demography, habitat, social traditions and settings, social status, religious beliefs, gender, and environmental considerations. History, concepts, and principles of cultures and cuisines. F, S

340 Research and Project Development in Interior Design
Research, development, and presentation of a programming proposal for a large scale commercial or residential interior. Prereq: ADHM 353, 368, 460 with a grade of C or higher in all prereq courses. F

336 Codes for Interiors
Health and safety issues in interior design. Includes codes, regulations, and universal design. Prereq: ADHM 263, 264. Coreq: ADHM 351, 365, 366, 367 with a grade of C or higher in all prereq courses. F

334 Global Retailing
Analysis of the sewn-product manufacturing processes, governmental regulations, sourcing, and technology applications. Focus on evaluating products' quality, performance, and cost. Prereq: ADHM 366 or 367. S

332 Sewn-Product Manufacturing and Analysis
Analysis of the sewn-product manufacturing processes, governmental regulations, sourcing, and technology applications. Focus on evaluating products' quality, performance, and cost. Prereq: ADHM 366 or 367. S

330 Facility Operations and Analysis
Integrative organizational theory applied to financial structures, management procedures, support functions, and operations within a major facility. Prereq: ACCT 102. F (even years)

328 Hospitality Marketing and Sales
Basic marketing theory and contemporary practice as adapted to the hospitality industry. Emphasis on consumer behavior, market opportunities, marketing research and strategies, and marketing plans. Prereq: ADHM 140, 141, BUSN 360. S

324 Beverage Operations
Identification and evaluation of beverages served in hospitality establishments with a focus on making quality decisions. Beverages presented will include alcohol (spirits, wines, liqueurs, and beer), coffee, tea, soft drinks, and mineral waters. Prereq: ADHM 140, 141. F

323 Global Fashion Economics
Study of factors affecting production, distribution, and consumption of products in domestic and foreign textile and apparel industries. Prereq: Junior standing, ECON 105, 201, or 202. F

321 Convention and Meeting Planning
The roles and responsibilities of professional meeting planners are examined. Planning or hosting a convention or meeting for a corporation, association, or special group. Emphasis on audio/visual equipment, room layout, and special requests. Prereq: ADHM 140 or 141. S

320 Professional Catering Management
Study and application of advanced operational managerial principles of food service management for on- or off-premise catering and special events. Prereq: HNES 141, 261, 261L. F

319 Resort and Spa Operations
Analysis of the resort concept; history, master planning, environmental impact, facility design, and operational management. Emergence of spa operations and treatments as part of resort amenities. Prereq: ADHM 140 or 141. F

318 Hospitality Industry Management Strategies
Capstone course for HTM majors. Includes opportunities to analyze hospitality issues, make strategic business decisions, and solve practical problems through case studies and simulations. Prereq: ADHM 241. Senior standing, S

317 Hospitality Industry Management
Understanding facilities and their components; mastering techniques and procedures for analyzing, planning, designing, constructing, programming, specifying furnishings, and equipping facilities. Prereq: ADHM 253. F (odd years)
481 Apparel and Textiles Capstone Experience 3
Critically analyze and propose research-based solutions to problems related to apparel and textiles including production, distribution, and retailing of goods and services. Prereq: Junior standing. S

482 Facility Management Capstone Experience 3
Focuses on integrative and problem-solving skills. Key competencies applied in completing a multi-phasic project focusing on benchmarking annual and five-year facility plans that culminate in a professional presentation. Prereq: ADHM 253, 380, Senior standing. S

486/686 Dress and Human Behavior 3
Influence of dress and appearance on human behavior throughout the life cycle. F

489 Study Tour 1-3
Faculty-directed tour to key fashion, design, tourism destinations, or business centers in the U.S. and abroad. Visits to off-campus destinations provide students contact with practicing professionals as they are exposed to the fast pace of a changing global industry. May be repeated. Prereq: ADHM 140 or 160, 171.

710 Consumer Behavior in Merchandising 3
Examination of psychological, sociological, and cultural theories of consumer behavior through the examination of factors influencing the consumer decision-making process.

720 Professional Advancement 3
Analysis of leadership and how it affects organizational culture and change through past and present experiences. Various leadership styles examined and a personal leadership philosophy developed for professional advancement in merchandising.

730 Product Design, Development, and Evaluation 3
Advanced study of issues and management strategies necessary to design and produce a competitively priced product. Examination of the role of globalization and rapidly changing technology on the development of a successful product.

736 Entrepreneurship in Dietetics 3
The economics of entrepreneurship, business plan development, and steps in starting your own business related to hospitality or dietetics, including consultation.

740 Promotional Strategies in Merchandising 3
Examination of integrated marketing communications (i.e., promotional strategies and techniques) while fostering cultural and global awareness, social responsibility and ethical decision making in the field of promotion.

750 Retail Theory and Current Practice 3
Theoretical and applied analysis of merchandising strategies; assessment of internal and external environmental forces impacting strategic decisions by retail firms; synthesis of past and present trends in order to forecast probable future patterns. Prereq: BUSN 362.

760 History and Contemporary Issues in Trade 3
The examination of fiber, textile, and apparel industries in a global context. Historical development of global and U.S. textile and apparel industries and how the economic, political, and social systems affect production and trade. Prereq: ADHM 710, 720, 730, 740, 750.

770 International Retail Expansion 3
Comprehensive understanding of theory, practices, and trends on international merchandise management. An analysis of global retail system and the way goods are distributed to consumers in various countries. Prereq: ADHM 710, 720, 730, 740, 750.

775 Research Methods in Merchandising 3
An overview of the research process used in social science, including an overview and analysis of research methodologies. Also includes a review of current merchandising literature with implications for future research. Prereq: Graduate level statistics course, ADHM 710, 720, 730, 740, 750.

780 Financial Merchandising Implications 3
The advanced study of financial trends in the merchandising industries; implications related to varied organizational structures. Focus will be on the financial implications of recent advances in the field. Prereq: ADHM 710, 720, 730, 740, 750.

785 Strategic Merchandising Planning 3
Examination of the executive planning process utilized to develop successful corporate strategies; emphasis on the importance of a market orientation for building customer value and sustaining a competitive advantage. Prereq: ADHM 710, 720, 730, 740, 750.

ARABIC (ARB)  
Homan, Chair

COURSES

101 First-Year Arabic I 4
Basic structures and vocabulary of modern standard Arabic. Practice in the fundamentals of listening, speaking, reading, and writing; introduction to the cultural context of the Arabic-speaking world. No previous knowledge of Arabic required. Not open to native speakers of Arabic.

102 First-Year Arabic II 4
Basic structures and vocabulary of modern standard Arabic. Practice in the fundamentals of listening, speaking, reading, and writing; introduction to the cultural context of the Arabic-speaking world. Continuation of ARB 101. Not open to native speakers of Arabic.

201 Second-Year Arabic I 3
Extended practice with grammatical structures and practical vocabulary to develop proficiency in listening and speaking; additional emphasis on development of skills in reading and writing; cultural topics. Prereq: ARB 102 or equivalent.

202 Second-Year Arabic II 3
Extended practice with grammatical structures and practical vocabulary to develop proficiency in listening and speaking; additional emphasis on development of skills in reading and writing; cultural topics. Prereq: ARB 201 or equivalent.

ARCHITECTURE (ARCH)  
Gleye, Chair; Aly Ahmed, Barnhouse, Booker, Christenson, Crutchfield, Faulkner, Lindquist, Mahalingam, Martens, Ramsey, Schwan, Urness, Wischer

COURSES

231 Architectural Drawing 3
Instruction in traditional (non-digital) representation of architectural designs: elevations, plans, sections, perspectives. Practice with presentation techniques. Prereq: Admission into second year of architecture or landscape architecture program.

232 Design Technology 2
Introductory exploration of digital design media and environmental technology in architecture and landscape architecture. Prereq: ARCH or LA 271. Cross-listed with LA.

271 Architectural Design I 6
Studio course focused on beginning exercises in basic design, incorporating abstract two-dimensional design, functional response to environmental determinants, the articulation of form, spatial organization, and aesthetic judgment. Prereq: Admission into second year of program.

272 Architectural Design II 6
Studio course focused on continuing exercises in basic design, incorporating abstract two-dimensional design, functional response to environmental determinants, the articulation of form, spatial organization, and aesthetic judgment. Prereq: ARCH 271.

321 History of Architecture I 3
History of architecture from ancient times through the Renaissance with attention placed on the design connections across cultures and across the globe. Lecture course.

322 History of Architecture II 3
History of architecture from the Baroque to the present placing within a global perspective. Lecture course.

326 Design Theory 3
Study of the theoretical, methodological, and ethical elements of architectural design. Prereq: Admission into second year of program.

344 Architectural Structures I 3
Overview of the principles of statics and mechanics of materials and structural concepts relative to building members and frames. Prereq: ARCH 371, MATH 146, PHYS 120.

351 Materials and Construction 4
Study of building materials from source through manufacture, focusing on their contribution to design and the study of the assembly processes of construction. Lecture course. Prereq: ARCH 272.

354 Architectural Detailing 3

371 Architectural Design III 6
Studio course providing intermediate level exercises in architectural design; responding to contextual, cultural, environmental, climatic, technological, and aesthetic determinants. Prereq: ARCH 272.

372 Architectural Design IV 6
Studio course continuing intermediate level exercises in architectural design: responding to contextual, cultural, environmental, climatic, technological, and aesthetic determinants. Prereq: ARCH 371.

443 Architectural Structures II 3
Overview of the principles of statics and mechanics of materials and structural concepts relative to building members and frames. Prereq: ARCH 344.
453 Environmental Control Systems: Passive Principles
Study of architectural design related to thermal comfort, climate, passive solar systems, daylighting, acoustics, and other environmental concerns. Prereq: ARCH 372.

454 Environmental Control Systems: Active Systems
Study of the basic fundamentals of illumination and basic power generation, distribution and service; heating, ventilation, and air-conditioning systems; plumbing systems; and acoustics as they relate to building design. Prereq: ARCH 453, 471.

461 Urban Design
Study of urban form and urban theory, development, and processes in a historic and contemporary context. Prereq: Junior standing.

471, 472 Architectural Design V, VI 6 each
Studio courses involving the complex organization of architectural spaces and forms in an urban context. Prereq: ARCH 372, 471 respectively. ARCH 471 is the Capstone course.

474 International Design Studio
Comprehensive design studio experience in advanced architectural studios to be conducted in culturally diverse, international locations. Prereq: ARCH 471.

663 Programming and Thesis Preparation

681 Professional Practice
Study of contemporary architectural practice covering professional development, firm organization, and project management within the context of the ethical, legal, and regulatory environment. Prereq: ARCH 472. Cross-listed with LA 581.

721 Non-Western Architectural Traditions 2
Advanced course on the investigation of design methods and building traditions of non-Western cultures and diverse geographic regions. May be repeated.

722 Urbanism 2
Advanced course to explore in-depth aspects of urban design. May be repeated.

723 Historic Preservation 2
Advanced course to explore the philosophy and techniques of preserving historic buildings. May be repeated.

724 Architectural Technology 2
Advanced course to explore the historical and theoretical underpinnings of architectural technology. May be repeated.

725 Architecture of the Recent Past 2
Advanced course to explore the major architectural movements and personalities since the mid-20th century. May be repeated.

726 Current Architectural Theory 2
Advanced course focused on current issues and the work and design theory of leading architectural practitioners around the world. May be repeated.

727 Vernacular Architectural Traditions 2
Advanced course to explore vernacular architectural traditions in North America and elsewhere. May be repeated.

728 Socio-Cultural Issues 2
Advanced course focused on the social issues and movements that have influenced environmental design.

771 Advanced Architectural Design 6
Advanced studio course addressing complex design problems requiring increased self-direction. Prereq: ARCH 472.

772 Design Thesis 8
Advanced studio course devoted to the execution of a comprehensive design thesis project, from schematic design through design development, presentation, and review. Prereq: ARCH 663, 771.

789 Professional Topics in Architecture 3
Various topics related to theoretical or methodological aspects of architecture as a professional discipline.

ART (ART)
Bromley, Groberg, Kapplinger, Swenson

COURSES

110 Introduction to the Visual Arts (CCN) 3
Study and analysis of artistic methods and meaning in the visual arts; designed for non-majors. (ND:HUM)

111 Introduction to Art History 3
Survey of world art from prehistoric to modern times designed for non-majors.

120 Painting I (CCN) 3
Introduction to basic painting through a variety of materials. Includes historical examples, painting the human figure, using acrylics, oils, pastel, and mixed-media.

122 Two-Dimensional Design (CCN) 3
Basic study of two-dimensional design for the studio artist.

124 Three-Dimensional Design (CCN) 3
Basic study of three-dimensional design for the studio artist. (ND:FA)

130 Drawing I (CCN) 3
Study and application of different drawing media, methods, and techniques. Drawing from the human figure required. (ND:FA)

150 Ceramics I (CCN) 3
Introduction to basic ceramic techniques. Includes wheel-throwing and hand-building techniques, surface decoration, glazing, and firing.

160 Sculpture I 3
Introduction to basic sculpture materials and techniques. Includes exploration of sculptural form in maquettes and large-scale work; additive and subtractive approaches in wood, stone, and mixed media; casting practice in plaster and hydro-stone.

170 Printmaking I (CCN) 3
Introduction to basic printmaking techniques and materials. Includes mono-print, collagraph, intaglio, relief, and serigraphy in both traditional and nontoxic methods.

180 Photography I (CCN) 3
Introduction to basic photography. Includes visual issues of black and white and color photography. Experience with black and white processing and printing.

185 Digital Media 3
Introduction to basic visual arts techniques and applications using computers, tablets, and other digital media.

210, 211 Art History I, II (CCN) 3 each
Intensive survey of art from Paleolithic to the Renaissance and from the Renaissance to the present. (ND:HUM)

220 Painting II 3
Intermediate study, studio practice, and critique. Use of oils, acrylics, watercolor, and mixed media. Painting the human figure and development of individual concept and content. Prereq: ART 120.

230 Drawing II (CCN) 3
Advanced study and application of different drawing media, methods, techniques and drawing the human figure. Prereq: ART 130.

250 Ceramics II 3
Intermediate study, studio practice, and critique. Development of individual concept and content. Further exploration of forming skills and surface decoration. Introduction to basic mold techniques, clay and glaze theory, and kiln technology. Prereq: ART 150.

260 Sculpture II 3

270 Printmaking II 3

280 Photography II 3

285 Digital Media II 3

320 Painting III 3
Advanced study, studio practice, and critique. Exploration of mixed-media. Emphasis on individual concept and content. Prereq: ART 220.

330 Drawing III 3

335 Figure Drawing 3
Exploration of the human form through drawing representationally, abstractly and expressively using a variety of media. Studying historic and contemporary use of the figure will be significant. Prereq: ART 130.

350 Ceramics III 3
Advanced study and studio practice with individual and group critique. Focus on current issues in ceramics and innovative use of form, process, and materials. Emphasis on individual concept and content. Prereq: ART 250.
360 Sculpture III

370 Printmaking III
Advanced study, studio practice, the human figure, and critique. Exploration of mixed-media. Emphasis on individual concept and content. Prereq: ART 270.

380 Photography III
Advanced study, studio practice, and critique. Professional practice, promotion, and presentation. Emphasis on individual concept and content. Prereq: ART 280.

385 Digital Media III

420 Painting IV
Advanced study, studio practice and critique in painting. Exploration and development of an individual concept. May be repeated. Prereq: ART 320.

430 Drawing IV

435 Advanced Figure Drawing
Advanced study, studio practice and critique in figure drawing. Continued exploration of the human form and development of an individual concept. May be repeated. Prereq: ART 335.

450 Ceramics IV
Advanced study, studio practice and critique in ceramics. A focus on current issues in ceramics with innovative use of form, process and materials centered in a personal use of content and formal issues. May be repeated. Prereq: ART 350.

451 History of American Art
Study of American art from pre-Columbian through contemporary (including Native American), emphasizing its highly individual nature and its effect on world art. Prereq: ART 210, 211.

452 Contemporary Art
Study of the development of contemporary art examining its cultural and intellectual basis; includes analysis of current art imagery and readings in art theory and criticism.

453 Topics in Art History
As an upper-division course in a specialized topic in Art History, the subject matter of the course varies by semester, allowing the curriculum to be more responsive and flexible in the subjects it addresses. May be repeated. Prereq: ART 210 or 211.

460 Sculpture IV
Advanced study, studio practice and critique in sculpture. A focus on current issues in sculpture with innovative use of form, process and materials centered in a personal use of content and formal issues. May be repeated. Prereq: ART 360.

470 Printmaking IV

480 Photography IV
Advanced study, studio practice and critique in photography. Students will expand knowledge of processes while extending their personal exploration. May be repeated. Prereq: ART 380.

485 Digital Media IV

489 Baccalaureate Project
3-6 Capstone research and creative experience within a specific area of interest with emphasis on refinement of aesthetic applications of techniques and media. May be repeated.

ATHLETICS (ATHL)
COURSES
111 Activity I
1 Basic techniques and practice of fitness activities.

116 Weight Training
1 Basic techniques and practice of weight training.

223 Intercollegiate Sports Participation
1 Participation on an intercollegiate sports team. May be repeated.

323 Intercollegiate Sports Participation
1 Participation on an intercollegiate sports team. May be repeated.

BIOCHEMISTRY (BIOC)
Dorsam, Haring, Killilea, Offerdahl, Srivastava
COURSES
CHEM 260 Elements of Biochemistry (CCN)
4 Protein structure, function conformation, and dynamics; enzymes; DNA-RNA: structure and flow of genetic information; biological membranes; metabolism. 4 lectures. Recommended: CHEM 117 or 122, 140 or 240. Also listed under CHEM.

460/660 Foundations of Biochemistry and Molecular Biology I
4 Rigorous treatment of biomolecules, generation and use of metabolic energy, biosynthesis, metabolic regulation; storage, transmission, and expression of genetic information. 4 lectures, 1 three-hour laboratory. Recommended: CHEM 240 or 342.

461/661 Foundations of Biochemistry and Molecular Biology II
4 Interrelations between metabolic pathways and controls, with emphasis on mammalian systems; biochemistry of specialized tissues, fluids, and hormones; regulation of gene expression in eukaryotes; genetic defects in metabolism. 4 lectures. Recommended: BIOC 460.

465/665 Principles of Physical Chemistry and Biophysics
4 Conceptual approach to physical chemistry and biophysics; molecular structure, energy, equilibria, and kinetics. Application of fundamental concepts and related instrumental techniques to the life sciences. 4 lectures. Recommended prerequisite: MATH 147, PHYS 212. Recommended coreq: BIOC 460.

473/673 Methods of Biochemical Research
3 Advanced separation, characterization, and enzymological techniques for research in the biological sciences are emphasized. 1 lecture, 2 three-hour laboratories. Recommended: BIOC 461. Recommended coreq for 673: BIOC 701.

474/674 Methods of Recombinant DNA Technology
3 Principles and techniques of recombinant DNA construction, gene cloning, and analysis of gene structure. 1 lecture, 2 three-hour laboratories. Recommended: BIOC 461. Recommended coreq for 674: BIOC 702.

475/675 Computer Applications in Biochemistry and Molecular Biology
3 This course will cover basic and advanced biochemical calculations and the use of computer programs to make these calculations. Programs for the presentation of data and seminars will also be presented. Recommended: BIOC 460.

483/683 Cellular Signal Transduction Processes and Metabolic Regulation
3 Advanced topics in regulation of metabolic processes including signal transduction, reversible and irreversible covalent modification, hormonal effects, protein turnover, and related phenomena. 2 lectures. Recommended for 683: BIOC 702.

485/685 Industrial Biotechnology
3 Discussion of commercial biochemical processes, including industrial fermentation and fermentor design, immobilized cell and enzyme bioreactors, product recovery methods, relevant metabolic pathways, and other aspects of industrial biotechnology. 3 lectures. Recommended: BIOC 460 or 702, MICR 350.

487 Molecular Biology of Gene Expression
3 This is an advanced undergraduate course designed to analyze current information regarding biochemistry and molecular biology of gene expression and regulation in prokaryotes, eukaryotes and archaea, with primary emphasis on eukaryotic systems.

701, 702 Comprehensive Biochemistry I, II
4 each Comprehensive treatment of the chemistry and biochemistry of proteins, nucleic acids, carbohydrates, lipids, vitamins, hormones, and the specific metabolism of these substances. 4 lectures. Recommended: CHEM 342, BIOC 701 respectively.

716 Protein and Enzyme Biochemistry
3 Advanced topics in protein properties and structure, and the influence of these factors on enzyme kinetics and mechanism. 3 lectures. Recommended: BIOC 702.

717 Carbohydrate/Lipid Biochemistry
3 Advanced topics in the structure, reactions, biosynthesis, and properties of carbohydrate and lipid materials of plant and animal origin. 3 lectures. Recommended: BIOC 702.
719 Molecular Biology of Gene Expression and Regulation 3
Advanced topics in molecular biology and regulation in prokaryotes, eukaryotes, and archaea; early events in developmental gene expression. 3 lectures. Recommended: BIOL 702.

721 Genomics Techniques 2
See Plant Sciences for description.

**BIOLOGICAL SCIENCES (BIOL)**
Bleier, Department Head; Anderson, Asplin, Barker, Biga, Butler, Clambey, Clark, Eslinger, Greenlee, Kenyon, Montplaisir, Otte, Reed, Reindl, Schroer, Sheridan, Stockwell, Travers

**COURSES**

**Biology (BIOL)**

111, 111L Concepts of Biology, Lab (CCN) 3, 1
Introduction to a wide range of biological topics, from the organism, ecology, and evolution to the cell, molecular biology, and genetics. (ND:LABSC)

124, 124L Environmental Science, Lab (CCN) 3, 1
Ecological principles related to human cultures, resource use, and environmental alterations. (ND:LABSC)

126, 126L Human Biology, Lab (CCN) 3, 1
Consideration of selected problems in human biology. Cross-listed with ZOO. (ND:SCI)

150, 150L General Biology I, Lab (CCN) 3, 1
Introduction to cellular and molecular biology, genetics, and evolution. (ND:LABSC)

151, 151L General Biology II, Lab (CCN) 3, 1
An introduction to the biology of living organisms and their interactions with each other and their environments. Examples primarily involve plants and animals, but include other groups of organisms as well. (ND:LABSC)

220, 220L Human Anatomy and Physiology I, Lab (CCN) 3, 1
An in-depth introduction to structure and function of human organs systems - cells, tissues, the integumentary system, the skeletal system, joints, muscle and muscular system, nervous tissue and nervous system, and the special senses. F (ND:LABSC)

221, 221L Human Anatomy and Physiology II, Lab (CCN) 3, 1
A continuation of BIOL 220, 220L; the endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems and development. S

310L Methods in Cell and Molecular Biology 3
This course exposes students to the most recent experimental methods used to study common organisms used in biological research. Techniques used include gel electrophoresis, chloroplast transformation, genetic analysis, gene sequencing, and basic molecular genetics. Prereq: BIOL 150, 150L.

315, 315L Genetics, Lab (CCN) 3, 1
See Plant Sciences for description.

364 General Ecology 3
Ecological principles associated with organism environment interactions, populations, communities, and ecosystems. Quantitative approach with examples (animal, plant, microbial) included. Prereq: BIOL 150 or 151. Cross-listed with ZOO.

440/640 Biotechnology and Ethics 2
Study of ethical issues associated with the development of emerging technologies and their application in solving biological problems. Prereq: BIOL 150 or Junior standing.

459/659 Evolution 3
Discussion of the mechanisms of evolution, including population genetics, selection, speciation, adaptation, and molecular evolution. Capstone course for Botany and Biological Sciences majors. Prereq: BIOL 315, 364, BIOL 260 or 460.

478/678 Methods In Animal Physiology 3
Students will investigate physiological functions at the cell, tissue, organ and organismal levels. Prereq: BIOL 150 and BIOL 151. Coreq: ZOO 460 or ZOO 462.

480/680 Ecotoxicology 3
Ecotoxicology, the behavior of pollutants in and effects on ecosystems; top-down and bottom-up approaches for assessment/prediction of effects on populations, communities and ecosystems; ecotoxicological testing at single/multi-species levels; biomarkers; passive/active biomonitoring. Prereq: BIOL 150 and BIOL 150L and BIOL 151 and BIOL 151L. (even years)

705 Teaching College Science 3
This course is designed for graduate students in the sciences who are interested in learning more about science teaching and student learning at the undergraduate level. Cross-listed with EDUC.

730 Growth Biology 3
See Animal Sciences for description.

742 Quantitative Biology 3
See Entomology for description.

750 Advanced Ecology 3
This course covers classical ecological literature and current literature focusing on ecological research philosophy and techniques. An overview/introduction of a variety of statistical methods for analyzing ecological data is covered. Prereq: ZOO 364, STAT 330.

776 Population Dynamics 4
Principles and mechanics of animal population dynamics. Prereq: BIOL 364 and an interest in working with numbers, S (odd years)

777 Population Analysis 3
Contemporary maximum likelihood approaches to estimating abundance, survival, reproduction, and dispersal in free-living populations. Goodness-of-fit and information theory applied to population model selection. Examples from a variety of real populations. Prereq: BIOL 776, STAT 660 or 661, ENT 742.

784 Biological Research Principles 3
Discussion, analysis of published research papers, lectures on selected topics, and student research proposal. Prereq: STAT 725 or 350 and 331.

785 Photobiology 3
Topics are related to student interests and can include photosynthesis, animal visual systems, light regulated metabolism, pigmentation, photoreceptors, biosensors, photomorphogenesis, and photoperiodic responses. Emphasis will be on recent papers in photobiology. Prereq: BIOL 460.

**Botany (BOT)**

314 Systematic Botany 3
Principles of plant systematics as illustrated by study of variation within and relationship between selected families and orders of vascular plants. Prereq: BIOL 151, 151L.

315, 315L Genetics, Lab 3, 1
See Plant Sciences for description.

372 Structure and Diversity of Plants and Fungi 4
Comparative survey of diversity in plants (Kingdom Plantae) and fungi (Kingdom Fungi), with emphasis on reproductive and vegetative morphology. Major groups and specific examples discussed in lecture will be given detailed study in the laboratory. Prereq: BIOL 150 or 151.

380 Plant Physiology Lab 1
Optional laboratory course accompanying BOT 380. Molecular, biochemical, and physiological techniques will be used to address contemporary problems in plant physiology. Coreq: BOT 380.

431/631 Intermediate Genetics 3
See Plant Sciences for description.

450/650 Range Plants 3
See Range Science for description.

452/652 Plant Structure 3
Study of the development and structure of cells, tissues, and organs of vascular plants. 2 lectures, 1 laboratory. F (even years)

460/660 Plant Ecology 3
Ecological structure, processes, and patterns observed with plant communities and populations as influenced by environmental conditions. Illustrations provided with local fieldwork. Prereq: BIOL 151, 151L. Cross-listed with RNG.

471/671 Phycology 3
Identification, systematics, evolution, ecology, life histories, physiology, cytology, and culture of algae. Prereq: BIOL 151, 151L.

472/672 Lichenology 3
Biology, ecology, and systematics of lichen fungi. Prereq: BIOL 151, 151L.

716 Agrostology 3
See Range Science for description.

717 Aquatic Vascular Plants 2
See Range Science for description.

720 Advanced Cell Biology 3
In-depth survey of cell biology, including studies of membranes, secretion cytoskeleton, cellular movement organelles, and gene regulation. Prereq: BIOL 702.

762 Environment and Adaptation 3
764 Ecological Processes
Ecosystem dynamics (short-term, successional, evolutionary), component interactions, ecological energetics, and biogeochemical transfers, with consideration of anthropogenic aspects. Historical and theoretical viewpoints included. Prereq: BIOL 364.

780 Plant Metabolism and Plant Stress Physiology
A detailed study of the dynamics, compartmentation, and interactions among metabolic processes in plants and the changes that occur in response to various biotic and abiotic stresses. Prereq: BOT 380 or BIOL 460.

782 Regulation of Plant Growth

Zoology (ZOO)
126, 126L Human Biology, Lab
See Biological Sciences (Biology) for description. Does not count toward major or minor. (ND:SCI)

280 Comparative Chordate Morphology
Introduction to the systematics, history, and structure of chordates, especially the vertebrates. Prereq: BIOL 151, 151L.

315, 315L Genetics, Lab
See Plant Sciences for description.

360 Animal Behavior
Description of the principal behavior patterns of animals with consideration of ecological, evolutionary, and internal mechanisms. Prereq: BIOL 151, 151L.

364 General Ecology
See Biological Sciences (Biology) for description.

370 Cell Biology
Structure and function of cells, including cell surfaces, membranes, organelles, cytoskeleton, cell division, cell physiology, and methods used in cell studies. Prereq: BIOL 150, 150L, CHEM 341.

380 Vertebrate Histology
Study of the microscopic anatomy of vertebrate tissues and organs, especially mammals. Prereq: BIOL 151, 151L.

431/631 Intermediate Genetics
See Plant Sciences for description.

440/640 Microbial Ecology
Microbial ecology introduces the student to basic, applied, and current concepts in microbiology and the environment. It considers the roles of microorganisms in maintaining environmental quality and the role of environment in determining microbial diversity. Prereq: ZOO 364.

450/650 Vertebrate Zoology
Survey of the biology, classification, and evolution of vertebrates. Emphasis on major phyla, marine, and parasitic taxa. Prereq: BIOL 151, 151L.

452/652 Ichthyology
Biology and taxonomy of fishes. Prereq: BIOL 151, 151L.

454/654 Herpetology
Primarily a field and laboratory course focusing on amphibians and reptiles. Students must make a commitment to participate in at least one of two 4-day field trips plus an independent review project. Prereq: BIOL 151, 151L.

456/656 Ornithology
Introduction to the biology, classification, and identification of birds, especially local forms. Early morning field trips required. Prereq: BIOL 151, 151L.

458/658 Mammalogy
Biological and taxonomy of mammals. Prereq: BIOL 151, 151L.

460/660 Animal Physiology
Study of the physical and chemical principles that govern cell, tissue, organ, organ system, and organismal function. Prereq: BIOL 150, 150L, CHEM 341.

462/662 Physiological Ecology
Comparative physiology of the vertebrates. Study of biochemical, morphological, and behavioral mechanisms involved with compensatory changes in response to changes in ontogeny and/or external environment. Prereq: BIOL 151, 151L.

463/663 Physiology of Reproduction
See Animal Sciences for description.

463L/663L Physiology of Reproduction Laboratory
See Animal Sciences for description.

464/664 Endocrinology
Physiology and anatomy of endocrine glands; chemistry and interrelations of their secretions. Prereq: BIOL 151, 151L.

470/670 Limnology
Biological, physical, and chemical features of freshwater ecosystems. Prereq: BIOL 151, 151L, 364, one year chemistry. F/2 (odd years).

472/672 Fisheries Biology
Principles of ecology and limnology applied to fish production. Prereq: BIOL 364. S/2 (even years).

474/674 Fisheries Management
Techniques used in the study and management of fish. Prereq: ZOO 472. S/2 (even years).

475/675 Conservation Biology
Integrative approach to the study and conservation of biodiversity. Application of principles from various subdisciplines of the biological and social sciences to current conservation problems. Prereq: ZOO 315, 315L.

476/676 Wildlife Ecology and Management
Application of ecological principles to management of game and non-game wildlife populations. Field trips required. Prereq: BIOL 364.

477/677 Wildlife and Fisheries Management Techniques
Students will learn traditional and state-of-the-art techniques used in the study and management of fish, wildlife, and other animal populations. Topics will include assessment of population characteristics, habitat, behavioral ecology and genetic structure. Field trips required. Prereq: ZOO 476.

482/682 Developmental Biology
Analysis of the processes of development, with an emphasis on animal development. Topics range from classical embryology to the cellular and molecular basis of development. Prereq: BIOL 151, 151L.

720 Advanced Cell Biology
Study of molecular biology of plant and animal cells including molecules, molecular organization, growth and development, nuclear function, cell cycle, and cellular communication. Prereq: BIOL 702.

750 Advanced Conservation Biology
This class will cover recent developments in the field of evolutionary theory and their implications in the study of animal adaptation, ecology, and behavior. Prereq: BIOL 364.

764 Neuroendocrine and Endocrine Systems

770 Aquatic Community Ecology
Nature and ecological roles of the freshwater biota. Discussion of contemporary issues in aquatic ecology. Prereq: ZOO 470. F/2 (even years).

BUSINESS ADMINISTRATION (BUSN)

189 Skills for Academic Success
See University Interdisciplinary Studies for description.

310 International Business
Study of international business: ways in which it differs from domestic operations; benefits of operating globally; and political, cultural, and economic problems faced by managers of firms engaged in international activities.

318 Taxation in Management Decisions
See Accounting for description.

340 Principles of Finance
Various concepts and analytical tools in business finance. Includes financial mathematics, valuation, financial analysis and planning, funding sources, capital budgeting, cost of capital, leverage, dividend policy, and working capital management. Prereq: ACCT 200, 201, ECON 201, 202, STAT 330.

347 Principles of Real Estate
See Agricultural Economics for description.

350 Foundations of Management
Study of the major functional areas of management including an international perspective of management.
351 Foundations of Organizational Behavior
A behavioral approach to management with emphasis on the understanding of individual behavior in groups in organizations. Topics include motivation, communication, perception, and cultural diversity. Prereq: BUSN 350.

352 Operations Management

360 Foundations of Marketing
Survey of the four basic areas of marketing: product, price, place, and promotion. Exposure to consumer behavior and strategic marketing from an international perspective.

362 Foundations of Retailing
Analysis of the global retail environment and exposure to issues such as the development of retailing image, location theory, inventory management, and integrated marketing communication. Prereq: BUSN 360.

372 Global Retailing
See Apparel, Design and Hospitality Management for description.

374 Cooperatives
See Agricultural Economics for description.

383 Organizational Communication I
See Communication for description.

413 Business Internship
Supervised professional experience with an appropriate public or private business. Students must meet standards established by the employer and the College of Business Administration.

415 Small Business Institute
Practical application of classroom learning in a supervised consulting project with a local business. Teams analyze actual business problems, and develop recommendations for the client.

430/630 Legal and Social Environment of Business
Study of legal and regulatory environment in which business firms operate, as well as the social environment. Includes business ethics and social responsibility issues.

431 Business Law I – Contracts, Property and Torts
A study of the foundations of business law and commercial transactions: the law of contracts, personal property, real estate, insurance, wills and estates, and torts.

432/632 Business Law II – Business Organizations and Commercial Transactions
A study of advanced topics in business organizations and commercial transactions: the law of sales, commercial paper, agency, business organizations, secured transactions, bankruptcy, securities regulation, and accountants’ liability. Prereq: BUSN 431 or 430/630.

435/635 International Business Law
Study of public and private international law as it relates to international business: international contracts and sales; international business organizations; and international trade, tariffs, and agreements. Prereq: BUSN 430.

436/636 Law of Electronic Commerce
This course will examine the domestic and international legal and regulatory environment of electronic commerce, including the law relating to commercial transactions in cyberspace and liability for those engaged in business on the Internet.

441/641 Investment Analysis and Management
Evaluation of various securities for investment (stocks, bonds), investment analysis (fundamental and technical), concepts of efficient markets, and market risk. Portfolio management and international investment aspects are briefly covered. Prereq: BUSN 340.

442/642 Speculative Markets
Evaluation of options, futures, and other derivative securities used for hedging, speculation, and arbitrage. Related market structure, trading strategies, and risks are examined. Prereq: BUSN 340 and any BUSN 400 level course satisfying finance concentration.

443/643 Management of Financial Institutions

444/644 Money and Capital Markets

445/645 International Finance
Concerns international financial markets, exchange rates, currency futures, and options. Includes financial aspects of international corporations such as management of corporate assets and liabilities, capital structure, cost of capital, capital budgeting, and international risks. Prereq: BUSN 340.

446 Corporate Finance
This course is an extension of BUSN 340 with specific focus on the time value of money, risk and return trade-off, capital structure and firm value, project analysis, dividend policies, and financial case analysis. Prereq: BUSN 340.

450/650 Human Resource Management
Survey of human resource management, including job analysis, recruitment, selection, performance appraisal, compensation, training, and labor relations. The impact of environmental influences such as legislation, court decisions, and unions on human resource activities are addressed. Prereq: BUSN 350.

451 Managerial Economics
Use of decision science techniques such as statistical and numerical analysis and optimization to study profit, demand and supply, cost and production, market structure, pricing practices, and the impact of government regulations on management decisions. Prereq: BUSN 350, ECON 201, 202, MATH 146.

452/652 Compensation Management
Study of the human resource management function of compensation. Topics include the job analysis, job evaluation, wage determination, pay-for-performance, and employee benefits. The impact of compensation on recruitment, satisfaction, and performance is examined. Prereq: BUSN 450/650.

453 Understanding and Managing Diversity in Organizations
Use of case analysis and experiential learning to consider the theoretical perspectives and practical implications of different forms of diversity at three management levels: personal values and actions; group dynamics; institutional policies and practices. Prereq: BUSN 350.

454/654 International Management

455/655 Negotiation and Alternative Dispute Resolution
An exploration of negotiation and conflict settlement in interpersonal, business, and international settings. Topics include techniques used in negotiations and alternative dispute resolution procedures such as mediation and arbitration. May be repeated. Prereq: BUSN 350.

456 Entrepreneurship/Small Business Mgmt
A comprehensive entrepreneurship/small business course that examines entrepreneurial ideas, processes, individuals; new venture creation and growth (including franchises and family business); and application of management, marketing, and finance tools to the small business context.

457/657 Leadership in Organizations
This course will give students a comprehensive view of the principles, practices, and challenges of contemporary leadership and followership. Prereq: BUSN 350.

458/658 Labor-Management Relations
Analysis of human resource management in the presence of labor unions. Topics include: labor history, labor law, organizing unions, contract negotiations and administration, contract dispute resolution, labor-management cooperation, and strikes. Prereq: BUSN 350.

460/660 Consumer Behavior
Examination of dimensions of consumer buying theories. Aimed at understanding the buying behavior of customers. Prereq: BUSN 360.

461/661 Advertising and Integrated Marketing Communication
Examination of the use of advertising as part of the worldwide marketing function; prepares the student to analyze and plan integrated marketing communication campaigns. Prereq: BUSN 360.

462/662 Sales and Sales Force Management
Examination of different aspects of effective personal selling with focus on decision areas pertaining to sales force management. Prereq: BUSN 360.

463/663 Marketing Research
Study of research methods with focus on research design, data collection, and analysis techniques. Prereq: BUSN 360, STAT 331.

464/664 International Marketing
Focused on identifying and satisfying global customer needs better than the competition, both domestic and international, and coordinating marketing activities within the context of the global environment. Prereq: BUSN 360.
465 Marketing Strategy
The analysis, planning, implementation, and control of worldwide marketing programs to achieve an organization’s objectives including an examination of the progress of the Internet for the marketing of goods and services. Prereq: BUSN 360.

466/666 Services Marketing
This course focuses on management and strategic issues as they relate to the marketing of services. Prereq: BUSN 360.

467/667 Sports Marketing
Focus on effective sports marketing, including an understanding of the sport consumer, the sport product, research, development, and sponsorship and licensing. Areas of sport considered include professional, collegiate, and youth sport, as well as adult and youth recreation and fitness. Prereq: BUSN 360.

481 Supply Chain Management
Identification of the key elements in a firm’s management of their supply chain. Theory and practical applications for analyzing and developing strategies to assist firms in obtaining and maintaining a competitive advantage.

486 Senior Thesis
Directed development of a paper showing the application, synthesis, and integration of business concepts.

489 Strategic Management

730 Legal Aspects of Business
This course will study law related to business in the areas of agency, accountant legal liability, business organizations, contracts, debtor-creditor relationships, government regulations of business transactions, real property, sales, and the Uniform Commercial Code. Prereq: BUSN 430/630.

740 Advanced Financial Management
In-depth coverage of concepts and decision-making tools in financial analysis, cost of capital, capital structure, capital budgeting, and dividend policy. Emphasis on risk analysis, international perspectives, and current topics in corporate finance. Prereq: BUSN 340.

750 Advanced Organizational Behavior
Study of theory and current management research dealing with individual and small-group behavior in organizations. Topics include motivation, reward, job satisfaction, stress, communication, and conflict resolution. Prereq: BUSN 350.

751 Advanced Operations Management
Advanced study of concepts and technologies used by service and manufacturing firms with emphasis on process analysis and improvements. Includes demonstration and application of techniques such as simulation, linear/integer programming, and project scheduling. Prereq: STAT 330.

760 Strategic Marketing Management
Focus on the major decision areas that marketing executives face in their efforts to match the objectives and resources of the organization with the needs and opportunities in the marketplace. Prereq: BUSN 360.

780 Business Conditions Analysis
Preparation of students to analyze domestic and global economic factors that impact the U.S. and world economy. Prereq: BUSN 760.

789 Business Policy and Strategy
Process and tools of strategy formulation and implementation in a variety of organizational environments. Prereq: BUSN 740, 750, 751, 760.

CEREAL AND FOOD SCIENCES (CFS)
Myers, Chair: Chang, Hall, Khan, Manthey, Schwarz, Simsek; Adjunct Faculty: Doehlert, Grant, Hareland, Ohlm, Wiesenborn

COURSES
200 Introduction to Food Systems
The fundamentals of food science and food safety will be introduced with emphasis on how food components and processing affect quality and safety of foods.

210 Introduction to Food Science and Technology
Overview of food components, food quality, nutrition, processing, packaging, safety, sanitation laws, sensory evaluation, distribution, and utilization.

370 Food Processing I
This course is designed to provide students with an introduction to food processing methods. The course will provide hands-on experience with a focus on basic food processing methods. Prereq: CFS 210.

430/630 Food Unit Operations
Thermodynamics, materials and energy balance, fluid flow, heat transfer, heat exchange, all related to food processing. Prereq: MATH 147, PHYS 211, 211L. Coreq: CFS 431/631.

450/650 Cereal Technology
Discussion of cereal grains, their properties, evaluation, and utilization.

452/652 Food Laws and Regulations
See Food Safety for description.

453/653 Food and Dairy Microbiology
See Microbiology for description.

454/654 Bioprocessing
See Microbiology for description.

460/660 Food Chemistry
Study of food components including water, carbohydrates, lipids, proteins, vitamins, minerals, and enzymes. Prereq: CFS 210, CHEM 341, 341L.

461/661 Food Chemistry Laboratory
Laboratory isolation, observation of characteristics, and quantitation of food components. Coreq: CFS 460/660.

464/664 Food Analysis
Principles, applications, and practice of methods for quantitative determination of food components. 2 lectures, 1 three-hour laboratory. Prereq: BIOC 460, CFS 460/660.

470/670 Food Processing II
This course is designed to provide students with an in-depth academic and practical exposure to food processing methods and the food industry. Concepts in quality control systems and sanitation will be discussed. Prereq: CFS 370.

471/671 Food Processing Laboratory

474/674 Sensory Science of Foods
The science used in the evaluation of flavor, color, and texture of foods. Experiential approaches will be used to evaluate sensory characteristics of foods. Prereq: CFS 460/660, STAT 330.

480/680 Food Product Development
This course is designed to provide students the opportunity to incorporate the basic principles of food science in the theoretical development of food products. (Food Science Capstone). Prereq: CFS 453, 464, 470.

725 Food Policy
See Food Safety for description.

752 Advanced Food Microbiology
See Food Safety for description.

758 Fundamentals of Flour Testing and Baking
Flour testing, industrial, and experimental bread baking. Production methods, ingredients, and baking reactions. Lectures and laboratories. Prereq: CFS 450/650.

759 Milling
Experimental and industrial feed and flour milling. Production, equipment, and factors involved in the milling process. Lectures and laboratories. Prereq: CFS 450/650.

760 Pasta Processing
Durum wheat quality, pasta production, and pasta quality evaluation. Lectures and laboratories. Prereq: CFS 450/650.

761 Malting and Brewing
Barley and malt quality; malting and brewing. Lectures and laboratories. Prereq: CFS 450/650.

764 Cereal Carbohydrates
Carbohydrates (monosaccharides, oligosaccharides, and polysaccharides) of cereals with emphasis on barley, wheat, and flour and their importance in industrial products. Prereq: BIOC 701.

765 Advanced Cereal and Food Chemistry I
Physiochemical, structural, functional, and analysis of cereal and food carbohydrates and enzymes. Biochemical aspects of these components will also be presented.

766 Advanced Cereal and Food Chemistry II
Physiochemical, structural, and functional properties of cereal and food proteins and lipids in food systems.

CHEMISTRY (CHEM)
Hersheger, Chair; Burghaus, Cook, Jacobson, Jayaraman, Liu, Offerdahl, Oswald, Page, Radke, Rasmussen, Rodgers, Sibi, Sun, Zhao

COURSES
117, 117L Chemical Concepts and Applications, Lab (CCN)
Introduction to general and organic chemistry, with applications drawn from the health, environmental, and materials sciences. Recommended coreq: MATH 103 or 107. (ND:LABSC)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>121, 121L</td>
<td>General Chemistry I, Lab (CCN)</td>
<td>3,1</td>
</tr>
<tr>
<td>122, 122L</td>
<td>General Chemistry II, Lab (CCN)</td>
<td>3,1</td>
</tr>
<tr>
<td>140</td>
<td>Organic Chemical Concepts and Applications (CCN)</td>
<td>1</td>
</tr>
<tr>
<td>150, 160</td>
<td>Principles of Chemistry I, Lab</td>
<td>3,1</td>
</tr>
<tr>
<td>240</td>
<td>Survey of Organic Chemistry (CCN)</td>
<td>3</td>
</tr>
<tr>
<td>260</td>
<td>Elements of Biochemistry (CCN)</td>
<td>4</td>
</tr>
<tr>
<td>341, 341L</td>
<td>Organic Chemistry I, Lab (CCN)</td>
<td>3,1</td>
</tr>
<tr>
<td>342, 342L</td>
<td>Organic Chemistry II, Lab (CCN)</td>
<td>3,1</td>
</tr>
<tr>
<td>353</td>
<td>Majors' Organic Chemistry Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>364, 365</td>
<td>Physical Chemistry I, II</td>
<td>4 each</td>
</tr>
<tr>
<td>380</td>
<td>Chemistry Junior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>387</td>
<td>Computational Quantum Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>425/625</td>
<td>Inorganic Chemistry I</td>
<td>3,3</td>
</tr>
<tr>
<td>426/626</td>
<td>Crystallography/Crystal Chemistry</td>
<td>2,2</td>
</tr>
<tr>
<td>427/627</td>
<td>X-Ray Diffraction</td>
<td>2,2</td>
</tr>
<tr>
<td>428/628</td>
<td>Geochemistry</td>
<td>3,3</td>
</tr>
<tr>
<td>429</td>
<td>Inorganic Chemistry Laboratory</td>
<td>2,2</td>
</tr>
<tr>
<td>431, 431L</td>
<td>Analytical Chemistry I, Lab</td>
<td>3,2</td>
</tr>
<tr>
<td>435/635</td>
<td>Chemical History</td>
<td>2,4</td>
</tr>
<tr>
<td>471</td>
<td>Physical Chemistry Laboratory</td>
<td>2,2</td>
</tr>
<tr>
<td>472/672</td>
<td>Surface Chemistry</td>
<td>2,2</td>
</tr>
<tr>
<td>476/676</td>
<td>Introduction to Computational Quantum Chemistry</td>
<td>1,1</td>
</tr>
<tr>
<td>486/686</td>
<td>Corrosion and Its Control by Coatings</td>
<td>2,2</td>
</tr>
<tr>
<td>724</td>
<td>Chemical Applications of Group Theory</td>
<td>1,1</td>
</tr>
<tr>
<td>725</td>
<td>Inorganic Chemistry II</td>
<td>3,3</td>
</tr>
<tr>
<td>726</td>
<td>Photochemistry and Photophysics</td>
<td>2,2</td>
</tr>
<tr>
<td>727</td>
<td>Organometallic Chemistry</td>
<td>2,2</td>
</tr>
<tr>
<td>728</td>
<td>Physical Methods in Inorganic Chemistry</td>
<td>2,2</td>
</tr>
<tr>
<td>729</td>
<td>X-Ray Structure Determination</td>
<td>2,2</td>
</tr>
<tr>
<td>730</td>
<td>Separations</td>
<td>2,2</td>
</tr>
<tr>
<td>732</td>
<td>Electrochemistry</td>
<td>4,4</td>
</tr>
<tr>
<td>733</td>
<td>Instrumentation Electronics</td>
<td>5,5</td>
</tr>
<tr>
<td>734</td>
<td>Mass Spectrometry</td>
<td>2,2</td>
</tr>
<tr>
<td>737</td>
<td>Gas Phase Ion Chemistry</td>
<td>2,2</td>
</tr>
<tr>
<td>740</td>
<td>Physical Organic Chemistry</td>
<td>4,4</td>
</tr>
<tr>
<td>742</td>
<td>Physical Organic Chemistry II</td>
<td>2,2</td>
</tr>
<tr>
<td>743</td>
<td>Reactive Intermediates</td>
<td>2,2</td>
</tr>
<tr>
<td>744</td>
<td>Organic Spectroscopy</td>
<td>2,2</td>
</tr>
<tr>
<td>745</td>
<td>Organic Synthesis</td>
<td>4,4</td>
</tr>
</tbody>
</table>

Recommended coreq: MATH 103 or 107. (ND:LABSC)

Recommended coreq: CHEM 121, 121L or 151, 161.

Recommended coreq: CHEM 364, 365, 366.

Recommended coreq: CHEM 425, 426, 427.

Recommended coreq: CHEM 736, 737, 738.

Recommended coreq: CHEM 741.

Recommended coreq: CHEM 742/632.
746 Advanced NMR Spectrometry 2
Theory of pulsed FT-NMR, instrumentation, pulse sequences (with emphasis on multipulse experiments), two-dimensional NMR and applications. Recommended: CHEM 745. Half semester.

747 Heterocycles 2
Synthesis of heterocycles, aromaticity, organometallic chemistry, nucleosides, natural products. Recommended: CHEM 745.

748 Total Synthesis of Natural Products 2
Retrosynthetic analysis, total synthesis, terpenes, alkaloids will be studied. Prereq: CHEM 745.

754 Organic Spectroscopy Laboratory I 1
Laboratory to accompany 744, with emphasis on NMR techniques. Recommended coreq: CHEM 744. Half semester.

759 Intermediate Physical Chemistry 3
Fundamental principles of physical chemistry including quantum chemistry, spectroscopy, molecular thermodynamics, and kinetics.

760 Statistical Thermodynamics 4
Macroscopic and microscopic models for the study of equilibrium properties of pure phases and solutions. Recommended: CHEM 365.

761 Optical Spectroscopy 2

763 Kinetics 2

764 Dynamics 2
Chemical physics of energy transfer and reactive collisions. Recommended: CHEM 763. Half semester.

766 Quantum Chemistry I 4
Wave functions and their properties, quantum mechanical behavior of atoms and molecules. Recommended: CHEM 365.

767 Quantum Chemistry II 2
Ab initio and semi-empirical methods for the calculation of energetic and structural properties of molecules; computational methods. Recommended: CHEM 766. Half semester.

CHILD DEVELOPMENT AND FAMILY SCIENCE (CDFS)

Deal, Head; Bjööde, Blodgett-Salia, Bratteli, Brotherson, Duggan, Fitzgerald, Habedank, Hcetner, Kaler, Light, McGeorge, Pankow, Randall, Sanders, Stone-Carlson, Torges, Werlinger, Woods

COURSES

135 Family Science 3
Introduction to family science concepts including family life cycle, different styles of family life, and the influence of society on the family.

182 Wellness and Aging 3
Study of wellness in the later years with a focus on the positive aspects of aging and the contributions of elders in society including emphases on research, theory, and wellness resources.
Course Descriptions

475/675 Children and Families Across Cultures 3
Study of developmental and family issues as viewed from a cross-cultural diversity perspective.

476 Child Exploitation and Abuse 2

477/677 Financial Counseling 3

478/678 Financial and Consumer Issues of Aging 3
Integration of economic and consumer problems of the elderly including income trends in retirement and health care. Prereq: 6 credits social science.

479 Children as Witnesses 2
Critical analyses of issues related to children's testimony in the family and child-care legal arena. Emphasis on developmental perspective of credibility and validity of children's testimony, including cognition, memory, suggestibility, effects of repeated questioning.

480/680 Learning and Cognition in Children 3
Study of developmental research and theoretical approaches to learning and cognitive development in children from birth through adolescence. Prereq: CDFS 230, 330.

481/681 Women and Aging 3
Study of theory, research, and application of issues related to women and the aging experience. Prereq: CDFS 460.

482/682 Family Dynamics of Aging 3
Examination of issues related to family life in the later years from the perspectives of the elderly and the family. Prereq: 6 credits social science.

485 Capstone Experience in CDFS 3
Integration and application of concepts. Emphasis on theory and research in CDFS, processing and presenting information, and community service. For CDFS majors who will graduate within one year. Prereq: 6 credits social science.

486/686 Children in Social Contexts 3
Critical examination of research and theory on social relationships established in childhood and adolescence. Special attention given to the development of peer relationships and school contacts and contexts specific to certain children. Prereq: CDFS 330.

487 Practicum in Child Development Programs 1-8
Supervised on- or off-campus experience in early childhood settings. Application of theoretical and practical knowledge as a professional. Prereq: Grade of C or better in CDFS 330, 341, 371, 381, first aid and infant/toddler CPR certification.

488/688 Exceptional Child and Family 3
Study of children and their families who vary from the norm in development and functioning. Prereq: 6 credits social science.

701 Graduate Orientation Seminar 1
Introduction to graduate program, faculty, policies and procedures.

703 Research Methods in Child Development and Family Science 3
Introduction to research methods in child development and marital and family relationships. Includes instrument selection/construction, data collection, interpretation of results, and proposal writing. Emphasis on the unique methodological features associated with the field.

710 Foundations of Youth Development 1
This course will examine the fundamentals of youth development and the youth development profession. Through this introduction to the field, students will explore the ethical, professional, and historical elements of youth development as it has evolved toward professionalization.

711 Youth Development 3
An introduction to theory and research in positive youth development. The course emphasizes how the developmental tasks of this life stage are influenced by (and influence) family and home, school, peers, and other contextual forces. The course will help students recognize and become familiar with the major issues and transitions of adolescents.

712 Community Youth Development 3
Focuses upon community youth development from a strength-based approach. This approach is a holistic and dynamic understanding of youth and communities encompassing both individual development (i.e. positive youth development) and adolescents' interrelationships with their environments. Emphasis is placed upon research, theory, and practice.

713 Adolescents and Their Families 3
This course explores adolescent development in the context of the family. The bi-directional influences between adolescents and their families will be examined. Implications for professionals working with youth and families will be explored and highlighted.

714 Contemporary Youth Issues 3
This course presents issues faced by youth today and associated risk and resiliency factors. A different topic is presented each year. Past topics have included Youth Violence, Youth and Appearance, and Volunteerism. The course may be taken more than once, as long as the topic areas are different each time.

715 Youth In Cultural Contexts 3
This course will examine the cultural contexts that affect youth from within and outside the family. Students will be encouraged to think critically about society and culture, gain further knowledge of how ethnic groups fit historically into society, and examine how history has shaped the current cultural climate of the U.S.

716 Youth Professionals as Consumers of Research 3
Students will learn the basics of quantitative and qualitative research approaches that will enable them to understand, evaluate, and critique research articles. Students will be able to judge the validity and usefulness of research articles in order to guide their educational or therapeutic interventions or public policy decisions.

717 Program Design, Implementation, and Evaluation 3
Focuses on hands-on tools for conducting strategic planning, designing program logic model, and evaluating the performance of programs for youth and families. Students will develop knowledge through participating in a community-based project involving the practical application of program design and evaluation methods.

718 Administration and Program Management 3
This course introduces students to the development, administration and management of youth-serving organizations.

719 Youth Policy 3
This course examines federal and state policies that impact the developmental opportunities for youth. A guiding question that will be used to evaluate these existing (and prospective) policies is whether they contribute to, or act as barriers to desired developmental outcomes.

722 Applied Research in Gerontology 3
Study of research in applied social gerontology. The course will explore quantitative and qualitative approaches to studying older persons and related systems.

760 Aging Policy 3
Formation, implementation and impact of policies that affect the well-being of the elderly in the United States.

761 Applications in Gerontology 3
Study of the applications of gerontology research and theory. The course will provide an overview of programs, methods and evaluations of services for older adults.

762 Retirement Planning, Employee Benefits and the Family 3
Critical examination of micro and macro considerations in retirement planning for individuals and families.

763 Personal Income Taxation 3
Study of principles and concepts of personal income tax planning as they relate to families.

764 Family Economics 3
Overview of basic concepts and theories in family economics with emphasis on the economics situation of families in the United States.

765 Insurance Planning for Families 3
An in-depth study of risk management concepts, tools, and strategies for individuals and families.

766 Estate Planning for Families 3
Study of principles and concepts of estate planning as they relate to families.

767 Professional Practices in Family Financial Planning 3
Study of strategies and methods for managing private family financial planning practices including ethics, compensation, client-centered marketing and practice management.

768 Housing/Real Estate 3
Overview of the role of housing and real estate in the family financial planning process including taxation, law, mortgages, ethics and financial calculations.

769 Financial Planning Case Studies 3
Examines professional issues in family financial planning including ethics, regulation on certification, communication, and professional responsibility. Emphasis on personal finance case studies and investment policy.

770 Fundamentals of Financial Planning 3
Survey of personal/family financial planning including process, time value of money, cash management, credit, taxation, insurance, housing, investments, retirement, and estate planning.
771 Investing for the Family's Future 3 Study of the concepts of time and risk value of money in evaluating investment markets.

773 Foundations of Couple and Family Therapy I 3 This course introduces students to the foundational theories in the field of couple and family therapy. This course also offers a critique of the foundational principles of the field from a critical social justice perspective.

774 Foundations of Couple and Family Therapy II 3 Study of theories and interventions that apply to work with couples in therapy. Other topics include sex therapy, domestic violence, issues related to gender, race, and class, and therapy with LGBT couples.

775 Clinical Applications of Couple and Family Therapy I 3 This course offers an introduction to socially just approaches to couple and family therapy including narrative and feminist therapies. This course also focuses on working with the gay, lesbian, bisexual, and transgender community. Coreq: CDFS 794.

776 Clinical Applications of Couple and Family Therapy II 3 This course explores ethical issues related to working with children; assessment of children; child play therapy; family play therapy; child abuse; and grief and loss within the context of sexism, racism, classism, and heterosexism. Coreq: CDFS 794.

777 Diagnosis and Assessment in Couple and Family Therapy 3 This course explores issues related to assessment and diagnosis in the treatment of individuals, couples, and families within the context of sexism, racism, classism, and heterosexism; and practical application of the DSM-IV-TR. Coreq: CDFS 794.

780 Ethics and Professional Issues in Couple and Family Therapy 3 Study of ethical and professional issues in couple and family therapy. Focusing on legal, feminist, personal, and relational ethics. Exploring the influence of the contextual issues of racism, classism, sexism, and heterosexism on ethical practice.

781 Family Systems 3 Advanced study of contemporary family systems with emphasis on research, ethics, media, and current family issues.

782 Advanced Human Development: Birth Through Childhood 3 Critical examination of current research and theories on child development. Emphasis on applying theoretical understanding and knowledge of the current empirical research base to current issues facing children and families.

783 Dynamics of Parent-Child Relations 3 Study of selected theories and research in parent-child relations. Emphasis on interaction between adults and children from infancy to youth. Prereq: CDFS 784, 785.

784 Advanced Human Development: Adolescence Through Adulthood 3 Critical examination of current research and theories on adolescent and adult development. Emphasis on applying theoretical understanding and knowledge of the current empirical research base to current issues facing adolescents, adults, and families.

785 Family Theory 3 Identification and analysis of theoretical approaches to research on the family. Study of frameworks currently used.

CIVIL ENGINEERING (CE) 3

111 Introduction to Civil Engineering 2 Introduction to duty and role of the professional engineer, phases of engineering design activities, computer applications with word processing and spreadsheets. 2 one-hour lectures.

204 Surveying 4 Measurements and errors; topographical and construction surveys; vertical and horizontal control methods; field exercises and computation techniques for surveying data; computation of earthwork volumes. 2 one-hour lectures, 2 three-hour laboratories. Prereq: MATH 105 or 107. F, SS

212 Civil Engineering Graphic Communications 3 Integrating manual drafting and computer-aided drafting and design in one course with emphasis on civil engineering practices. This required course will be taught at sophomore level to get students properly prepared for civil engineering courses. Prereq: CE 111, F, S

303 Civil Engineering Materials 3 Physical and chemical properties of different types of building materials and Portland cement concrete. Industry standards and tests for evaluating raw materials and mix designs. 2 one-hour lectures, 1 three-hour laboratory. Prereq: CE 316 or CM&F 320. S

309 Fluid Mechanics 3 Statics, kinematics, and dynamics of fluid flow; momentum and energy concepts; flow through pipes; uniform flow in open channels; pumps and measurement of flow. 3 one-hour lectures. Prereq: ME 222. F, S

310 Fluid Mechanics Laboratory 1 Visualization and verification of the concepts of fluid flow, pumps, turbines, and flow meters. 1 two-hour laboratory. Prereq: CE 309. F, S

316 Soil Mechanics 3 Principles of soil mechanics including three-phase composition, classification, effective stress, consolidation, shear strength, compaction, and site investigation. 2 lectures, 1 two-hour laboratory. Prereq: ME 222, ME 223, Coreq or prereq: MATH 266. F

343 Structural Engineering and Analysis 4 Structural loading and analysis of statically determinate and indeterminate structures. Covers the elastic analysis and deformations of trusses, beams, and frames using force methods, displacement methods, matrix methods, and moment distribution. Prereq: ME 223. S

370 Introduction to Environmental Engineering 3 Introduction to various municipal and industrial pollutants being introduced into water, air, and land systems and their effects on the environment. Application of chemical, physical, and biological principles to the management of these pollutants. 3 one-hour lectures. Prereq: CE 309, CHEM 122. S

371 Environmental Engineering Laboratory 3 Water, wastewater, and solid waste analyses regarding their theory, objectives, and practices. Exposure to practical applications of the scientific and design theories presented in CE 370. 1 three-hour laboratory. Prereq or Coreq: CE 370. S

404 Reinforced Concrete 3 Principles of design and analysis of reinforced concrete members, flexural and shear design of rectangular and rectangular beams, serviceability criteria, short and slender columns. 2 one-hour lectures, 1 two-hour session. Prereq: CE 343. F

405/605 Advanced Reinforced Concrete 2 Development and anchorage of reinforcement, details of reinforcement in flexural members, continuous beams and one-way slabs, slender columns, two-way slabs. 1 one-hour lecture, 1 two-hour session. Prereq: CE 404. F

408 Water Resources and Supply 3 Hydrologic concepts, development of water supply sources, principles involved in the collection and transportation of water/wastewater/storm runoff, and distribution of water for municipal use. Prereq: CHEM 122, ME 309. S

410/610 Water and Wastewater Engineering 3 Principles involved in treatment, disposal, reuse, and recycling of municipal water supplies and wastewaters. Laboratory introduces tests to evaluate treatment requirements and effectiveness. 3 one-hour lectures, 1 three-hour laboratory. Prereq: CE 370. F

411/611 Design of Pre-stressed Concrete 2 Theory and design of pre-stressed concrete structures, pre- and post-tensioning, loss of pre-stress, proportioning of flexural members, deflections. 2 one-hour lectures. Prereq: CE 404. S

417/617 Slope Stability and Retaining Walls 2 Performance and design of retaining walls, sheet pile walls, braced walls, and reinforced earth. Also evaluation and mitigation of unstable earth slopes. 2 one-hour lectures. Prereq: CE 316. S

418 Transportation Engineering 4 Location, analysis, modeling, and design of multi-modal facilities including highways, railways, airports, terminals, harbors, ports, canals, waterways, pipelines, and conveyor systems. 3 one-hour lectures, 1 two-hour session. Prereq: CE 204, ME 221, MATH 259. S

419/619 Pavement Design 3 Design of flexible and rigid pavements including sub-grade, base courses, surface courses; evaluation criteria including soil, climate, traffic, material, drainage; initial and maintenance cost considerations; construction practices. 2 one-hour lectures, 1 two-hour session. Prereq. CE 303. S

421/621 Open Channel Flow 3 Geometric and hydraulic properties of open channels, momentum and energy principles, design of channels for uniform flow, gradually varied and rapidly varied flow. 2 one-hour lectures. Prereq: CE 309. S

430/630 Timber and Form Design 3 Analysis and design of wood structures and concrete formwork. 2 one-hour lectures, 1 three-hour session. Prereq: ME 223. S
441/461 Finite Element Analysis
Weak and strong solutions to governing differential equations in bars, boundary conditions, Galerkin approximation, nodal basis functions, shape functions. Two-dimensional problems with triangular and quadrilateral elements. 2 two-hour lectures. Prereq: MATH 266. F, S

442/462 Matrix Analysis of Structures
Review of matrix algebra, flexibility and stiffness methods, direct stiffness method, introduction to finite element analysis. 2 lectures. Prereq: CE 343. F, S

444 Structural Steel Design
Design of metal structures including mechanical behavior of metals; behavior and proportioning of tension and compression members; beams, beam columns, and connections; selection of metal structural systems. 2 one-hour lectures, 1 two-hour session. Prereq: CE 343. F

445/465 Advanced Steel Design
Analysis and design of metal structures including connections, selection of structural systems. 1 one-hour lecture, 1 two-hour session. Prereq: CE 444. S

446/464 Basic Dynamics of Structures
Analysis of single degree of freedom structural systems to harmonic and general dynamic loading, free vibration of multiple degree of freedom systems, modal superposition, earthquake engineering. 3 one-hour lectures. Prereq: CE 343. S

451/651 Advanced Surveying
Property description and legal land surveys. Astronomical observations to establish position and direction. State plane coordinates. 2 one-hour lectures. Prereq: CE 204. F

454/654 Geometric Highway Design
Location and design of highways and streets; design controls, elements of design; cross-section and alignment; design of intersections, interchanges, safety appurtenances, and noise barriers. 2 one-hour lectures, 1 two-hour session. Prereq: CE 418. F

455/655 Airport Planning and Design
System planning and demand forecasting; siting and configuration of airports; aircraft characteristics; air traffic controls; standards for geometric design, pavement design, earthwork, drainage, lighting, and marking. 2 one-hour lectures. Prereq: CE 418. F

456/656 Railroad Planning and Design
Rail planning and location analysis, track/rail structure, track layout and control system, locomotives and train resistance, track safety standards and geometrics, terminal design. 2 one-hour lectures. Prereq: CE 418. F

457/657 Pavement Management Systems
Pavement design, maintenance, and rehabilitation strategies; planning, budgeting, and programming for pavement management at network and project levels; development, design, and maintenance of pavement management systems. 2 one-hour lectures. Prereq: CE 303. F

458/658 Bituminous Materials and Mixtures
This course presents fundamental knowledge of asphalt material properties, performance requirements, specifications and related test characteristics. Prereq: CE 303. F

461/661 Foundation Engineering
Performance and selection of the following foundations: shallow, mat, combined pile, and drilled piers. 2 one-hour lectures. Prereq: CE 316. F

462/662 Designing with Geosynthetics
Theories, principles, and engineering design using geosynthetic materials for a variety of civil engineering applications. Applications to geotechnical, environmental, transportation, and water resources fields are emphasized. Includes construction issues. Prereq: CE 316. S

472/672 Solid Waste Management
Basic study of solid waste materials, current collection methods, available disposal techniques, recycling and resource conservation, and economics of solid waste collection and disposal. 3 one-hour lectures. Prereq: CE 370. F

473/673 Air Pollution
Fundamentals of air pollution and its control technology. Types and sources of air pollutants, meteorology, effects on plants, animals, people, and property. Design of control equipment. 3 one-hour lectures, 1 three-hour laboratory. Prereq: CE 370. S

477/677 Applied Hydrology
Scope of hydrology, probabilistic concepts in water resources, regional frequency analysis, application of risk concepts to hydrologic design, hydrologic data generation for ungauged watersheds, hydrologic modeling. 2 one-hour lectures. Prereq: CE 408. F

478/678 Water Quality Management
Physical, chemical, biological, hydrological characteristics, and hydrodynamic elements of receiving waters. Characterizations, measurement, and modeling methods of river/streams, lakes/reservoirs, and groundwater systems. 2 one-hour lectures. Prereq: CE 370. F, S

479/679 Advanced Water and Wastewater Treatment
Selected problems in the investigation and design of sewerage systems, water distribution systems, wastewater treatment plants, and water purification plants. 2 one-hour lectures. Prereq: CE 370, 410. S

483 Contracts and Specifications
Formation, interpretation, and termination of engineering contracts. Engineering specifications and drawings. Other legal matters of concern to engineers. 2 one-hour lectures. Prereq: Senior standing. S

486/686 Nanotechnology and Nanomaterials
This course covers principles of nanotechnology, nanomaterials and develops a framework for their understanding. The basic tools of nanotechnology: nanoscale characterization, physics and materials design will be discussed in the context of current technological advances. Prereq: Senior standing in Engineering or Sciences. Cross-listed with ME.

489 Senior Design
An open-ended capstone design project encompassing a number of the disciplines within civil engineering. 2 one-hour lectures. Prereq: Senior standing.

701 Theory of Elasticity
A theoretical study of linear elasticity, Saint Venant’s problems, plain stress, plain strain, strain energy, and torsion. 2 one-hour lectures.

702 Plates and Shells
Theoretical and applied study of the classical theories of plates and shells as they pertain to engineering problems including small displacement of rectangular and circular plates and thin shells. 2 one-hour lectures.

706 Plastic Design in Structural Steel
Inelastic bending of beams and frames, application of upper and lower bound theorems, calculation of deflection, effect of axial and shearing forces on flexural strength, connections, structural safety, and rules of plastic design. 2 one-hour lectures.

709 Dynamics of Structures and Foundations
Advanced topics in structural dynamics, frequency domain response, generalized coordinates, nonlinear structural response, dynamic analysis of framed structures, structures with distributed properties, seismic design considerations. 2 one-hour lectures. Prereq: CE 446.

714 Theory of Elastic Stability
Bending of beams under simultaneous action of axial and lateral loads, buckling of compressed bars in both the elastic and plastic ranges, design formulas, lateral buckling of beams. 2 one-hour lectures.

720 Continuum Mechanics
Tensor analysis in affine and metric spaces, kinematics of motion, general principles of continuum mechanics, thermodynamics of deformation, and postulates on constitutive laws. 3 one-hour lectures. Cross-listed with ME.

725 Biomaterials-Materials in Biomedical Engineering
This course covers the fundamentals of synthesis, properties, and biocompatibility of metallic, ceramic, polymeric and composite materials that are designed for replacement of biological materials such as hard and soft tissues.

762 Advanced Foundation Engineering
Advanced topics in performance and design of foundations. Current topics include a two-dimensional finite element analysis of the foundation and its supporting soil. 2 one-hour lectures. Prereq: CE 461/661.

768 Advanced Water and Wastewater Laboratory
Studies on selected processes, efficiency and evaluation of water and wastewater treatment. Selected methods of water and wastewater analyses. 2 one-hour lectures, 1 three-hour laboratory. Prereq: CE 371.

770 Hazardous Waste Site Remediation
Hazardous waste site remediation, hazardous treatment technologies. 3 one-hour lectures. Prereq: CE 370, 408.

771 Economics of Transportation Systems
See Agricultural Economics for description.

772 Rural Logistics and Distribution Management
See Agricultural Economics for description.

775 Industrial Waste Management
Regulations and standards on industrial pollution control, industrial waste characteristics, industrial waste management strategies, and waste treatment methods. Prereq: CE 610.

776 Groundwater and Seepage
Groundwater as a resource, relation to hydrologic cycle, well hydraulics, seepage, ground water quality and contamination, ground water flow models. 2 one-hour lectures. Prereq: CE 408.

778 Transportation Administration
Public organization behavior and administration, fund accounting, public budgeting, financial management, and strategic management of transportation agencies. Includes transportation case studies.
780 Transportation Planning
Development and trends in travel demand forecasting; trip generation, trip distribution, mode choice, traffic assignment; transportation plans for modal, multi-modal, and paratransit alternatives; policy formulation and analysis. 3 one-hour lectures. Prereq: CE 418.

781 Traffic Engineering
Traffic characteristics, studies, and control devices; operations analysis and design; aspects of signing, signalization, markings, and lighting; accident analysis; traffic laws and ordinances; work zone safety practices. 2 one-hour lectures, 1 two-hour laboratory. Prereq: CE 418.

782 Public Infrastructure Management and Construction
Management and construction of public infrastructure including streets, highways, and sidewalks: public transportation; street lighting and traffic control systems; potable water; wastewater and drainage; parks, recreation facilities, solid waste handling and disposal, and others. Prereq: CE 619, 656. Cross-listed with CM&E.

CLASSICAL LANGUAGES (CLAS)

Andrei, Nichipor

COURSES

101, 102 First-Year Latin I, II (CCN) 4 each
Introduction to forms, syntax, and vocabulary of classical Latin. 101: (ND:HUM)

151, 152 First-Year Greek I, II (CCN) 4 each
Introduction to forms, syntax, and vocabulary of Attic Greek along with selected readings. 151: (ND:HUM)

180 Scientific Terminology: Greek and Latin (CCN) 2
Brief survey of prefixes, suffixes, and roots from Greek and Latin, which form the technical vocabulary for science and medicine.

201, 202 Second-Year Latin I, II (CCN) 3 each
Designed to form a transition from introductory material to the Latin authors. Prereq: CLAS 102, 201 respectively.

251 Second-Year Greek I (CCN) 3
Introduction to Koine Greek as found in the New Testament. Prereq: CLAS 152.

252 Second-Year Greek II (CNN) 3
Readings from selected classical Attic Greek authors. Prereq: CLAS 251.

289 (CCN), 290 Biblical Hebrew I, II 3 each
Fundamentals of Hebrew script, grammar, and syntax. Includes selected readings from Biblical prose.

350 Glory of Greece 3
History of the ancient Greeks, their literature, politics, customs, art, and architecture.

360 Grandeur of Rome 3
History of ancient Rome, its literature, politics, customs, art, and architecture.

361 Cicero 3
Study of the life and times of Cicero through selections from his letters, speeches, and philosophical essays. Prereq: CLAS 202.

362 Virgil 3

363 Advanced Latin Prose 3

364 Advanced Latin Poetry 3

370 Classical Mythology 3
Study of the gods and heroes of the Greeks and Romans as found in classical and modern literature, sculpture, and painting.

451 Advanced Greek Prose 3
Readings from Classical Greek philosophers, historians, and orators in the original. Prereq: CLAS 252.

452 Greek Tragedy 3
Appreciation of Greek drama through reading selections from Aeschylus, Sophocles, and Euripides in the original. Prereq: CLAS 252.

CLINICAL LABORATORY SCIENCE (CLS)

P. Olson

COURSES

111 Introduction to Clinical Laboratory Science 1
Introduction to clinical laboratory science. Lectures, discussions, and field trips focus on professional traits and communication, ethical behavior of the health care provider, major curriculum requirements, and scope of practice.

300 Phlebotomy and Specimen Collection 2
This course integrates theory and practice to provide the basis for entry-level phlebotomy in healthcare settings. Students will learn techniques for venipuncture collection and transport, medical and legal implications, quality assurance, safety, and professional interactions. Prereq: BIOL 221 and Clinical Laboratory Science majors only.

435 Hematology 2
An introduction to the origin, maturation, and function of the formed elements of human blood. Identification of normal cells will be emphasized. Prereq: MICR 202L or 350L.

COATINGS AND POLYMERIC MATERIALS (CPM)

Croll, Chair; Bierwagen, Gelling, Voranov, Webster; Adjunct Faculty: Chisholm, Gebhard, Hill, Provder, Roesler, Skerry

COURSES

451/651 Laboratory, Chemical, Radiation, and Biological Safety 1
Hazards and safe practices in chemical, radiation and biological laboratories, applicable to all studies at NDSU. Recognized by the University as completion (for credit) of safety training to work in a research laboratory.

472/672 Environment and Chemical Industries 2
Environmental issues as they pertain to the chemical industry. Topics to include environmental regulations, the issues with disposal and waste, and designing environmentally compliant processes. Prereq: CHEM 121.

473/673 Polymers Synthesis 3
Chemical synthesis of all types of polymers, including the understanding and tailoring of materials formed by these very high molecular weight molecules. Polymers have unique properties due to their conformation and high molecular mass, and are used in a wide variety of applications from paints to structural, engineering materials. Prereq: CHEM 342.

474/674 Coatings I 3
Synthesis of resins used in coatings systems, structure-property relationships for polymer binder systems, crosslinking and film formation concepts, solvents and other materials in coatings. Prereq: CHEM 342.

475/675 Coatings II 3
Materials science of polymeric coatings, including their components, formulation, design, testing and application. Specialized topics include corrosion, color, appearance and adhesion. Prereq: CPM 474/674.

484/684 Coatings I Laboratory 2

485/685 Coatings II Laboratory 2
Formulation and application testing of coatings versus property requirements; color measurement and matching. Laboratory counterpart to CPM 475/675. 1 six-hour laboratory. Hours flexible. Prereq: CPM 484/684. Coreq: CPM 475/675.

486/686 Corrosion and Its Control by Coatings 2
Corrosion science: electrochemistry of corrosion, measurement of corrosion, choice of materials to mitigate corrosion, corrosion control by coatings, evaluation of coating protection lifetime. Coreq: CHEM 432, CPM 474/674, 475/675. Cross-listed with CHEM.

771 Modern Methods of Polymer Characterization 3
Understanding the physical properties of polymers and methods for their characterization. Focusing on the significance and interplay of physical parameters and the underlying physics of the characterization methods. Prereq: CHEM 365.

773 Organic Chemistry of Coatings 3
Synthesis of polymers used in coating systems, polymers having tailored and defined architectures; crosslinking reactions used in coatings. Prereq: CHEM 741.

775 Color and Appearance 3

777 Water-Soluble Polymers 2

778 Physical Chemistry of Polymers 4
Examines the interrelationships among polymer structure, morphology, physical state and properties. Key aspects include molecular weight, and its distribution, and the organization of the atoms along the polymer chain. Prereq: CPM 673.
782 Physical Chemistry of Coatings 3

785 Nanomaterials Chemistry 3
This 3-credit course is to teach graduate students the chemical synthesis, characterization and applications of nanomaterials.

COMMUNICATION (COMM)
P. Nelson, Chair; Beck, Burnett, Collins, Littlefield, Majdik, Meister, O’Connor, Okigbo, Pearson, Platt, Raika

COURSES
103 Introduction to Agricultural Communication 3
See Agriculture for description.

109 Communicating with Confidence 1
Designed for students who are reluctant to enroll in speech due to high speech anxiety. Focused on discussing causes of speech anxiety and practicing anxiety-reducing techniques. Does not satisfy any requirements for graduation.

110 Fundamentals of Public Speaking (CCN) 3
Theory and practice of public speaking with emphasis on content, organization, language, delivery, and critical evaluation of messages. (ND:COMM)

111 Honors Public Speaking 3
Accelerated theory and practice of public speaking with emphasis on content, organization, language, delivery, and critical evaluation of messages. Equivalent to COMM 110. Prereq: GPA of 3.5.

112 Understanding Media and Social Change (CCN) 3
Exploration of the purpose, function, and impact of media on society. Mass communication majors must earn a grade of B or better. (ND:SS)

114 Human Communication 3
Overview of communication theory with emphasis on information transmission and social influence functions of communication behavior in personal and mediated contexts. Speech communication majors must earn a grade of B or better.

150 Forensic Practice (CCN) 1
Applied speaking experiences in competitive and non-competitive settings. Speaking experiences in public address, oral interpretation, reader’s theatre settings, and competitive debate offered. May be repeated.

200 Introduction to Media Writing (CCN) 3
Introduction to writing in the styles and forms required in journalism, advertising, broadcasting, and public relations. Mass communication majors must earn a grade of B or better. Prereq: COMM 112, ENGL 120.

212 Interpersonal Communication (CCN) 3
Theory and practice of communication in interpersonal relationships. Includes aspects of self-expression and relationship communication. Speech communication majors must earn a grade of B or better.

214 Persuasive Speaking (CCN) 3
Elements of persuasive speaking with focus on evaluating information directed at the consumer. Includes strategies of altering attitudes, beliefs, values, and behavior. Prereq: COMM 110.

216 Intercultural Communication (CCN) 3
Exploration of the definition, models, and verbal processes of communication between different cultural groups. (ND:SS)

242 Advanced News Photography (CCN) 3
Exploration or photography in all phases of news. Introduction to techniques of photojournalism, including composition, lighting, and computerized editing of news photos. Prereq: COMM 200.

260 Principles of Internet Web-Based Design 3
This course aims to orient students to Web concepts, design, presentation, and evaluation. Prereq: CSCI 114 or 116.

261 Introduction to Web Development 3
Introduces the tools used by Web Development professionals, including HTML, Web editors, imaging software, JavaScript, and Acrobat PDF format. Prereq: CSCI 114 or 116.

271 Listening and Nonverbal Communication (CCN) 3
Theory and practice of effective listening; nonverbal aspects of human communication.

301 Rhetorical Traditions 3
Historical/examining examination of rhetorical theory from the classical through modern periods.

308 Business and Professional Speaking 3
Oral and written communication skills for professional and business settings. Includes resume, cover letter and memo writing; interpersonal and group applications; and interviewing and professional presentations emphasis. Prereq: COMM 110.

310 Advanced Media Writing 3
Construction of professional quality messages for print, public relations, and broadcast. Prereq: B or better in COMM 200.

312 Oral Performance Studies 3
Study and practice of the principles involved in oral performance. Includes the development of vocal qualities and articulation, as well as the analysis of literary texts representing a variety of genres and formats of interpretation. Prereq: COMM 110.

313 Editorial Processes 3
Principles of print media copy-editing, headline composition, publication design, photo editing, and computer editing. Prereq: COMM 200.

315 Small Group Communication 3
Focus on group processes, methods of problem solving, parliamentary procedures, and relational components of group interaction.

318 Argumentation and Advocacy 3
Theory and process of argumentation with practical experience in preparation and delivery of formal and informal arguments. Prereq: COMM 110.

320 Communication Analysis 3
Overview and application of basic methods used in communication analysis. Mass Communication and Speech Communication majors must earn a grade of B or better.

321 Introduction to Communication Theory 3
Major theoretical approaches to the study of communication from social scientific and humanistic traditions.

325 Applied Research Methods 4
See Political Science for description.

340, 341 Social Research Methods, Laboratory 3
See Sociology for description.

345 Principles of Broadcast Production 3
Creation, critique, and analysis of audio production and single camera video productions with special emphasis on radio and television news. Prereq: COMM 310.

362 Principles of Design for Print 3
Applications of various design principles and pagination techniques to cognitive problem solving involved in developing material for publication.

370 Principles of Public Relations 3
Public relations as a professional field; theory, principles, and practices used in solving public relations problems. Prereq: COMM 200.

375 Principles and Practices of Advertising 3
Advertising as a professional field; theory, principles, and practices used in advertising campaigns.

376 Advertising Creative Strategies 3
Introduces students to creative ideas in advertising and their translation into words and images. Emphasis is on strategic approaches to creative decision-making across all media. Prereq: COMM 375.

377 Advertising Media Planning 3
This course introduces students to the basic concepts of media planning and buying in advertising. Emphasis is placed on strategic approaches to the media placement process across all forms of media. Prereq: COMM 375.

380 Health Communication I 3
This course is designed to introduce students to the field of health communication. Students will learn about models of health communication, doctor-patient communication, designing and implementing health campaigns, and organizational communication in health organizations.

381 Patient-Provider Communication 3
This course is designed to provide verbal and nonverbal strategies to improve patient-provider interaction during the medical visit and subsequent sessions involving the diagnosis and treatment of health-related conditions. Prereq: B or better in COMM 112, 114, 212.

383 Organizational Communication I 3
Exploration of the theory of management communication practices in organizations. Emphasis on the formal structure and interpersonal aspects of supervisor-subordinate relations. Prereq: Junior standing. Cross-listed with BUSN.

402/602 Contemporary Rhetoric 3
Examination of the use of public address in the contemporary culture to identify styles of usage and ethical practices employed by communicators. Prereq: Junior standing.

412/612 Gender and Communication 3
Exploration of philosophical and theoretical issues surrounding gender construction, communication, and culture. Focus on ways in which communication in families, schools, media, and other institutions create and sustain gender roles.
421/621 History of Journalism
The history and development of journalism as shaped by the political and social environment. Prereq: COMM 310.

425 Specialty Writing
Methods and practice of writing features and opinion for print publications. Prereq: COMM 310.

431 Communication Ethics
Study of ethical theories and their role in conceptions of mass media responsibility. Capstone course.

433/633 Legal Communication
Verbal and nonverbal factors in the legal interview, negotiation and conflict resolution, jury selection, opening statements, witness examination, closing arguments, and jury deliberation. Designed for students interested in applied communication theory or pre-law.

434/634 Communication Law
Exploration of speech and press protections of the First Amendment; includes libel, privacy, electronic media regulation, and speech regulation.

435/635 Popular Culture and Mass Media
Analysis of popular culture messages (television, cinema, music, and radio) presented by the media as an expression of social values.

436/636 Issues in Mass Communication
Studies of mass communication topics in interaction with social, cultural, political, and economic realities. Media impact on national life and thought. May be repeated. Prereq: Junior standing.

442/642 Information Technologies and Mass Media
Focuses on the impact of globalization on media, business, non-profit and governmental organizations. Prereq: Junior standing.

443/643 Mass Media and Public Opinion
Overview of theories and methodologies used in the study of the role of mass media in attitude formation, attitude change, and public opinion. Prereq: Junior standing.

445 Advanced Broadcast Production
Development of skills in the creation, critique, and analysis of television productions in the studio and in the field. Prereq: COMM 345.

450/650 Issues in Communication
Development of skills in the creation, critique, and analysis of television productions in the studio and in the field. Prereq: COMM 345. May be repeated.

451/651 Directing Forensics
Theory and practical strategies for coaching individual speaking events and debate at the high school or collegiate levels. Prereq: Junior standing.

462 Web Database Programming
Introduces students to Web database concepts, design, normalization processes, and implementation. Prereq: COMM 260, 261.

472/672 Public Relations Campaigns
Social science research as applied to public relations, case study analysis, construction, and implementation of public relations campaigns. Prereq: COMM 370.

473 Case Study in Public Relations
Advanced study of applied public relations theory through intense case study analysis and research focused on organizations. Case studies from the Public Relations Society of America are used. Prereq: COMM 472.

474 Communication Campaigns
This course builds on the experience of other social sciences courses, and provides a foundation for purposeful uses of communication to achieve pre-determined informational, attitudinal, and/or behavioral objectives.

476 Advertising Campaign Practicum
This course challenges students to apply the knowledge they have gained in previous advertising classes. Specifically, students will design an advertising campaign including market research, creative execution, media planning, and account management. Prereq: COMM 376, 377.

480 Health Communication II
Designed to introduce students to advanced theory and research in health communication. Course topics include interpersonal health communication, intervention design, and global perspectives on health communication. Prereq: COMM 380

482 Organizational Communication II
Examination of the structure and function of interpersonal communication networks in formal organizations, methods of network analysis. Prereq: COMM 383.

484 Global Organizational Communication
Globalization and its impacts on organizations is examined. This course delves into the organizational dynamics of globalization by examining the three major types of organizations (economic, social, and government) and their global dynamics. Prereq: COMM 383.

485 Crisis Communication in Public Relations
Crisis communication practices in organizations of all types with emphasis on planning, emergency communication, image restoration, and organizational learning. Prereq: COMM 110. Cross-listed with SAFE.

487 Organizational Power and Leadership
This course emphasizes communicative dimensions of organizational leadership. Theory will be discussed as a foundation for leadership practices. Prereq: COMM 383.

489 Communication Capstone
This course is designed to integrate and assess the student's knowledge of the major through the development of a project.

700 Research Methods in Communication
Introduction to research planning and design, methods of research, and presentation of research results. Masters and Doctoral students have different sections.

701 Action Research in Communication
Introduction to Action-Oriented Research for doctoral students in communication. Concepts such as engaged learning, problem-based learning, and social justice will be explored. The course includes both the theory and practice of action research. Prereq: COMM 700.

702 Introduction to College Teaching in the Humanities and Social Sciences
See Humanities for description.

705 Advanced Communication Theory
Provides doctoral students with a structured forum for discussion of communication theory and research. Prereq: COMM 711.

706 Advanced Interpersonal Communication
Interpersonal communication theory and research methods are developed from the perspectives of uncertainty reduction, conflict management, relationship reciprocity, constructivism, compliance gaining, discourse dominance, and relational dynamics.

708 Advanced Qualitative Methods in Communication Research
In-depth application of one of the methods used in qualitative communication research. Prereq: SOC 700.

710 Advanced Quantitative Methods in Communication Research
Application of quantitative methods to communication research, with an emphasis on testing theoretically driven hypotheses, operationalizing variables, designing valid and reliable measures, implementing a research design, analyzing data, and reporting findings. Prereq: SOC 701, STAT 725.

711 Communication Theory
Major theoretical approaches to the study of communication from social scientific and humanistic traditions.

714 Marriage and Family Communication
Focuses on the dynamics of marriage and family communication. Theoretical frameworks include: symbolic interactionism; social constructionism; relational dialectics; social penetration; developmental theory; and relational culture. Prereq: COMM 700.

715 Theories of Small Group Communication
Survey of theoretical constructions of communication in the small group setting. Examination of current methods of research.

721 Intercultural Communication
Advanced theories of verbal and nonverbal behavior, attitudes, and communication styles that affect interaction between cultural groups.

725 Communication and Change
Investigation of the diffusion process and related variables affecting an innovation's rate of adoption.

731 Communication Ethics Seminar
Study of ethical theories and their relationship to the mass media.

750 Advanced Issues in Communications
Advanced theory and philosophy of research issues in the field of communication. May be repeated.

752 Theory of Argument
Philosophy and theory of argumentation; including exploration of analytical methods employed in argumentation.

755 Rhetoric of Environmental Science
This course focuses on the communication (rhetoric) of science and how disciplinary conventions and ideological commitments shape the language of environmental science in understanding "external realities."
### Course Descriptions

**761 Survey of Rhetorical Theory**
Historical-descriptive examination of rhetorical theory from the classical through modern periods.

**767 Rhetorical Criticism**
Survey of critical methods of inquiry that may be applied to oral discourse and frameworks for critically evaluating communication processes and products.

**780 Health Communication**
Advanced theories and principles of communication in the health professions.

**782 Theories of Persuasion**
Survey of the theories related to persuasion, attitudes, and values of societal groups, and the assessment of attitudes and values held by the public.

**783 Advanced Organizational Communication I**
Exploration of the theory of management communication practices in organizations. Emphasis on the formal structure of and interpersonal aspects of supervisor-subordinate relationships.

**784 Advanced Organizational Communication II**
Study of the structure and function of communication interaction in formal organizations and survey of methods of analysis including the communication audit. Also includes models of introducing innovations.

**785 Advanced Crisis Communication in Public Relations**
Long- and short-term issues for managing communication related to organizational crises are discussed in the stages of pre-crisis, crisis and post-crisis. Cross-listed with SAFE.

**786 Risk Communication**
See Food Communication for description.

**COMMUNITY DEVELOPMENT (CED)**
Klenow, Chair; Goreham

<table>
<thead>
<tr>
<th>COURSES</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>711 Principles and Strategies of Community Change</strong></td>
<td>Analyze theories, principles, strategies and practices of community change and development from a multidisciplinary perspective in order to construct a personal framework for the practice of community economic development.</td>
</tr>
<tr>
<td><strong>713 Community Development II: Organizing for Community Change</strong></td>
<td>An examination of the role of civil society in community planning efforts, the connection between social relationships and economic activity, the structure and implications of power, conflict management, inclusiveness, and equitable change.</td>
</tr>
<tr>
<td><strong>715 Community Analysis: Introduction to Methods</strong></td>
<td>An introduction to the research methods relevant to community development, strategies for reporting and applying findings in community action, and issues of research ethics and inclusiveness.</td>
</tr>
<tr>
<td><strong>717 Community and Regional Economic Policy and Analysis</strong></td>
<td>Explores theories of economic growth, community economic and industrial base, sources of economic growth or decline, and strategies for local and regional economic development.</td>
</tr>
<tr>
<td><strong>719 Community Natural Resource Management</strong></td>
<td>Theoretical frameworks, methodological investigation, and applied practices of natural resource development as a component of community economic development.</td>
</tr>
</tbody>
</table>

**COMPUTER SCIENCE (CSCI)**

<table>
<thead>
<tr>
<th>COURSES</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>114 Microcomputer Packages (CCN)</strong></td>
<td>General introduction to computer concepts, operating systems, the internet, web processing, spreadsheets, database management and presentation software. Credit awarded only for CSCI 114 or 116, not both. (ND:COMPSC)</td>
</tr>
<tr>
<td><strong>116 Business Use of Computers (CCN)</strong></td>
<td>Exploration of how microcomputers are used in business. Use of word processing, spreadsheet, database, graphing, and telecommunication applications. Credit awarded only for CSCI 114 or 116, not both. (ND:COMPSC)</td>
</tr>
<tr>
<td><strong>122 Visual BASIC (CCN)</strong></td>
<td>Introduction to programming in the BASIC/Visual BASIC language. (ND:COMPSC)</td>
</tr>
<tr>
<td><strong>125 Beginning COBOL (CCN)</strong></td>
<td>Introduction to programming in the COBOL language. (ND:COMPSC)</td>
</tr>
<tr>
<td><strong>126 Beginning FORTRAN (CCN)</strong></td>
<td>Introduction to programming in the FORTRAN language. Prereq: CSCI 110 or 114.</td>
</tr>
<tr>
<td><strong>155 Immigration (CCN)</strong></td>
<td>Introduction to programming in the current language of CSCI 160. For transfer students with CSCI 160 or equivalent, in a language different from that used there. Prereq: CSCI 160.</td>
</tr>
<tr>
<td><strong>159 Computer Science Problem Solving</strong></td>
<td>Computer-based problem solving techniques are introduced in the context of the Internet, including web-site development. Programming concepts, data structures and algorithms, as well as modeling techniques are discussed. (ND:COMPSC)</td>
</tr>
<tr>
<td><strong>160 Computer Science I (CCN)</strong></td>
<td>Introduction to computer science including problem solving, algorithm development, and structured programming in a high-level language. Emphasis on design, coding, testing, and documentation of programs using accepted standards of style.</td>
</tr>
<tr>
<td><strong>161 Computer Science II (CCN)</strong></td>
<td>Advanced concepts in computer science including data structures, algorithm analysis, standard problems such as searching and sorting and memory management issues. Prereq: CSCI 160.</td>
</tr>
<tr>
<td><strong>162 Intense FORTRAN (CCN)</strong></td>
<td>Intensive introduction to FORTRAN and its use in engineering applications. Students receive an introduction to numerical analysis, particularly error analysis. Prereq: MATH 103 or 107.</td>
</tr>
<tr>
<td><strong>172 Intermediate Visual BASIC</strong></td>
<td>Elements of Visual Basic for those with previous programming background. Topics include fundamental constructs, Active X controls, file processing, database management, and SQL. Prereq: one semester/experience in any programming language.</td>
</tr>
<tr>
<td><strong>212 Self-Paced C++</strong></td>
<td>Introduction to the C++ programming language. Students complete exercises and programming assignments at their own pace. Prereq: Programming skill in another language.</td>
</tr>
<tr>
<td><strong>214 Self-Paced C</strong></td>
<td>Introduction to the C programming language. Students complete exercises and programming assignments at their own pace. Prereq: CSCI 160.</td>
</tr>
<tr>
<td><strong>222 Discrete Mathematics</strong></td>
<td>Sets, functions, relations, logic, methods of proof, mathematical induction, combinatorics, recurrence relations, generating functions. Prereq: CSCI 160.</td>
</tr>
<tr>
<td><strong>227, 228 Computing Fundamentals I, II</strong></td>
<td>Two-semester sequence focused on problem solving and writing computer programs in a modern high-level programming language in a state-of-the-art programming environment. Second semester includes an introduction to the object-oriented programming paradigm. Prereq: MATH 103 or 107, CSCI 227 respectively.</td>
</tr>
<tr>
<td><strong>275 Digital Systems I</strong></td>
<td>See Electrical and Computer Engineering for description.</td>
</tr>
<tr>
<td><strong>277 Introduction to UNIX</strong></td>
<td>This course introduces students to the UNIX operating system environment. Topics include basic UNIX commands, operating system installation and administration, application installation, use of alternative shells, web servers, and system security. Cross-listed with MIS.</td>
</tr>
<tr>
<td><strong>315 System Analysis and Design</strong></td>
<td>Introduction to the front end of the software development life cycle. Includes various modern concepts, techniques, and tools for analyzing and designing well-structured software systems. Prereq: CSCI 160.</td>
</tr>
<tr>
<td><strong>316 System Testing and Maintenance</strong></td>
<td>Introduction to the back end of the software development life cycle. Includes various modern concepts, techniques, and tools for testing and maintaining software systems. Prereq: CSCI 315.</td>
</tr>
<tr>
<td><strong>335 [235] Theoretical Computer Science I</strong></td>
<td>Models of computation, regular expressions, finite automata, Kleene's Theorem, lexical analysis, context-free grammars, pushdown automata, introduction to parsing. Prereq: CSCI 161, 222.</td>
</tr>
<tr>
<td><strong>336 [236] Theoretical Computer Science II</strong></td>
<td>Parsing techniques, context-free languages, Turing machines, recursive and recursively enumerable languages, unrestricted grammars, unsolvable decision problems, computability, introduction to complexity. Prereq: CSCI 335.</td>
</tr>
<tr>
<td><strong>345 Topics on Personal Computers</strong></td>
<td>Exploration of some aspects of personal computers not covered in other courses, varies each time it is offered. May be repeated. Prereq: CSCI 161.</td>
</tr>
<tr>
<td><strong>366 Files for Database Systems</strong></td>
<td>File organization techniques, design, and implementation of database systems. Prereq: CSCI 161.</td>
</tr>
</tbody>
</table>
| **371 Web Scripting Languages** | This course examines Scripting Languages and their
applications. Emphasis will be placed on web scripting. A representative set of scripting languages will be covered. Prereq: CSCI 122. Cross-listed with MIS.

372 Comparative Programming Languages
Explanation of the concept and impact of a block-structured language. Several languages will be compared with respect to application, suitability, syntax, and semantics. Prereq: CSCI 161 or 228.

373 Assembly Programming
Machine language, assembly language, and related hardware concepts, assembly language programming, macros and subroutines, system facilities and macros. Prereq: CSCI 160. Cross-listed with ECE.

374 Computer Organization and Architecture
Organization and structure of the major sections of a computer: CPU, memory, and I/O system organization and implementation issues. Prereq: CSCI 373. Cross-listed with ECE.

413/613 Principles of Software Engineering
An introduction to concepts of software engineering. Software development activities through a project. Lifecycle models, requirements, specification, design, implementation, and testing. Software quality, tools, and techniques. A term paper for graduate students. Prereq: CSCI 161.

418/618 Simulation Models
Fundamental techniques involved in using a computer to simulate business, social, and industrial systems. Includes principles of random variate generation, statistical sampling, and design of experiments. Prereq: STAT 367.

426/626 Introduction to Artificial Intelligence
Introduction to artificial intelligence for undergraduates. Includes basic AI concepts and techniques. Prereq: CSCI 372.

436/636 Intelligent Agents
Fundamentals of Intelligent Agents technology, agent communication languages, applications, and intelligent agents development. Prereq: CSCI 372.

445 Software Projects Capstone
Presentations on the mechanics of working cooperatively as a team doing commercial software development. Students work in teams to deliver realistic work products to local businesses. Course presentations cover teamwork, software development pragmatics, and software documentation. Prereq: CSCI 366. Coreq: CSCI 489.

448/648 Digital Image Processing
Introduction to fundamental principles and techniques of digital image processing: image enhancement, image compression, and image analysis. Emphasis on hands-on experience in using software development packages and implementation of various image processing algorithms. Prereq: CSCI 372, MATH 166.

453/653 Linear Programming and Network Flows
Linear programming models and applications, primal and dual formulations, computational procedures; introduction to networks, maximum flow, and shortest path problems. Prereq: MATH 265.

454/654 Operations Research
Deterministic and probabilistic models of operations research: networks and project management, dynamic programming, non-linear programming, inventory, queuing, reliability, stochastic processes, and simulation. Prereq: CSCI 453/653, STAT 367.

458/658 Microcomputer Graphics
Information on the techniques by which computers generate images of 2 and 3D objects. Principles to guide the use of computer graphics to enhance human-computer interaction. Prereq: CSCI 372, MATH 146 or 165.

459/659 Foundations of Computer Networks
This is an introduction to fundamental concepts for the design and analysis of broadband networks. Topics include resource allocation, routing, congestion control, medium access, scheduling, and multicasting. Concepts are applied to state-of-the-art systems and protocols such as current and future Internet protocols.

460/660 Dynamic Programming
Basic principles and algorithms of dynamic programming as applied to sequential decision problems in C3 and OR. Prereq: MATH 166.

467/667 Algorithm Analysis
Design, correctness, and analysis of algorithms and data structures. Prereq: CSCI 160 and CSCI 222 or MATH 270.

468/668 Database Systems Design
Overview of the maintenance and manipulation of data bases. Includes a large project in C++. Prereq: CSCI 366.

469/669 Network Security
Cryptography and its application to network and operating systems security; authentication; email, web, IP, and wireless security; firewalls and intrusion detection techniques; security threats and countermeasures; legal and ethical issues. Prereq: CSCI 222, 459/659, C/C++ or JAVA.

473 Foundations of the Digital Enterprise
This course is designed to familiarize individuals with current and emerging electronic commerce technologies using the Internet. Prereq: CSCI 372.

474 Operating Systems Concepts
How operating systems manage the resources of a computer. Topics include processes, concurrency, scheduling, deadlocks, memory allocation, virtual and secondary storage. Prereq: CSCI 374.

475/675 Operating Systems Design
Advanced operating systems topics such as protection, errors, and distributed systems. Case studies of representative operating systems. Students work in small teams to implement their own basic operating systems. Prereq: CSCI 474.

476/676 Computer Forensics
This course introduces principles, techniques, tools, and practical skills necessary to perform rudimentary investigations of incidents in which computers play a significant or interesting role. Prereq: CSCI 474.

477/677 Object-Oriented Systems
Introduction to the concepts and advantages of object-oriented computer systems. Introduces exercises with at least one such language. Prereq: CSCI 372.

479/679 Introduction to Data Mining
Introduction to data mining includes basic data mining techniques, querying, spreadsheet data mining, data warehouses, evaluation techniques, knowledge discovery in databases, examples and a survey of advanced techniques. Prereq: Basic database course (e.g. CSCI 366, 468, 668, or 765).

488/688 Human-Computer Interaction
Survey of the methodologies and alternatives used in developing and evaluating human-computer interfaces. Prereq: CSCI 372.

489/689 Social Implications of Computers
Capstone course for Computer Science. Presentation and discussion of several ethical and social issues that have arisen from the introduction of the computer including copy-protected software and liability for computer software errors. Prereq: CSCI 372.

702 Performance Evaluation
Examination of basic techniques used to evaluate multiprogramming systems. Both queueing models and other analytical approaches are constructed with simulation and direct measurements of actual systems. Prereq: CSCI 475.

708 Foundations of Programming
Introduction to formalisms, in which computer programs are considered as mathematical objects, including weakest precondition and predicate calculus. Prereq: CSCI 336.

713 Software Development Processes
This course is designed as a breadth course on the software engineering process. Basic concepts are reviewed and re- sured to create a basis for higher concepts and techniques.

714 Software Project Planning and Estimation
This course is designed to introduce the student to concepts and techniques of how to plan for a software project. This includes time and effort estimation, planning and teaming the project, and managing the development activities. Prereq: CSCI 713.

715 Software Requirements Definition and Analysis
This course is designed to make the student able to identity and capture requirements for a software system and be able to document and assess the requirements. Prereq: CSCI 713.

716 Software Design
This course covers both architectural and module design. Students receive practice using a set of patterns to produce software designs with several different types of architecture. Substantial presentation and practice with the UML modeling language is provided. Prereq: CSCI 713.

717 Software Construction
This course covers the fundamentals of software construction including programming and evaluation of the source code. Students receive a good grounding in and extensive practice with the comprehensive libraries associated with a modern programming language. Prereq: CSCI 713.

718 Software Testing and Debugging
This course covers the goals, practices, evaluation and limitations of software testing and software debugging. Students receive practice in developing and using test plans and various testing and debugging techniques. Prereq: CSCI 713.

722 Compiler Construction
### 724 Survey of Artificial Intelligence
Survey of major areas of AI including theorem proving, heuristic search, problem solving, computer analysis of scenes, robotics, natural language understanding, and knowledge-based systems. Prereq: CSCI 372.

### 728 Computer Graphics
Principles and algorithms used in computer graphics packages. Emphasis on raster graphics, clipping, hidden-surface elimination, ray-tracing, radiosity.

### 730 Office Information Systems
Exploration of the evolution of the office since the introduction of the computer. Examination of the introduction of computers, word processors, database management systems, networks, and AI into the office. Prereq: CSCI 160.

### 732 Introduction to Bioinformatics
See Mathematics for description.

### 734 Expert Systems
Examination of types of expert systems, their powers and limitations. Students write their own expert system. Prereq: CSCI 724.

### 735 Neural Networks
Introduction to the parallel processing paradigms that have been developed recently including neural networks and genetic algorithms. Students will work on projects using these tools. Prereq: CSCI 724. Cross-listed with PSYC and IME 774.

### 737 System Simulation

### 741 Algorithm Analysis
Algorithm design and analysis, asymptotic analysis, worst and average case, recurrences, generating functions, divide-and-conquer, the greedy method, search and traversal, backtracking, branch-and-bound. Prereq: CSCI 161, MATH 166.

### 742 Algorithms and Complexity
Linear and nonlinear recurrences, algebraic problems, fast Fourier transforms, lower bound theory, computational geometry, the classes P and NP-completeness, Cook's theorem, NP-hard problems. Prereq: CSCI 741.

### 745 Formal Methods for Software Development
The course is a high level course with the aim of formal representation to be able to formally assess characteristics of software. The formal representations are based on the theoretical foundations of computer sciences such as set theory, logic or graph theory. Prereq: CSCI 713.

### 746 Development of Distributed Systems
This course is an advanced course in software engineering aiming at strategies and solutions of distributed systems. It assumes the knowledge of software engineering and particularly design and implementation of software systems, then builds on these concepts to how distributed systems are designed and implemented. Prereq: CSCI 713.

### 747 Software Complexity Metrics
This course covers complexity metrics for the entire software lifecycle. Students gain experience in using requirements metrics, design metrics, program metrics, test metrics, and planning metrics. The effectiveness and limitations of metrics in all these areas are emphasized. Prereq: CSCI 718.

### 758 Bioinformatics Data Mining
Techniques and objectives of data mining for biological data with focus on diverse data sources including graphs, sequences and text. Preparation for research in bioinformatics with focus on functional genomics problems. Prereq: CSCI 732.

### 759 Computational Methods in Bioinformatics
An introduction to computer science and operations research methods and algorithms that are used for analysis and solution of optimization and other models in bioinformatics.

### 760 Dynamic Programming
Dynamic programming as an algorithm design method, formulating and solving problems using dynamic programming, deterministic and stochastic problems in OR and CS. Prereq: MATH 166.

### 761 Integer Programming
Integer linear programs and modeling, theory and algorithms, duality and relaxation, cutting plane and branch-and-bound methods, combinational problems, total unimodularity, matching and matroids. Prereq: CSCI 653.

### 762 Network Flows
Theory and algorithms for network flow optimization including network representation data structures, basic change methods, maximum flow, shortest path, minimum cost problems, and generalized networks. Prereq: CSCI 653.

### 765 Introduction to Database Systems
Basic database concepts, models, management facilities, data structures, storage structures, data definition languages, data manipulation languages, normalization, operator implementation algorithms, transactions, correctness, reliability, distribution, performance analysis. Prereq: CSCI 366.

### 766 Database System Internals
Transaction management, processing; correctness; recoverability; serializability (conflict and view); concurrency control (2PL, BTO, GT, multiversion); recovery; distributed systems (correctness, recovery, replication); query processing and optimization. Prereq: CSCI 765.

### 773 Foundations of the Digital Enterprise
See department for description.

### 774 Topics of the Digital Enterprise
Topics in database, networks, cryptography, security, and software engineering as they apply to the digital enterprise. Prereq: CSCI 315. Recommended: CSCI 783.

### 778 Computer Networks
Examination of computer networks using the ISO-OSI model as a framework. Practical and theoretical issues are explored in modems, codes, error, impairments, modulation, protocols, and interfaces. Prereq: CSCI 474.

### 779 Advanced Data Mining
Advanced data mining includes in-depth coverage of Association Rule Mining (ARM), Classification and Clustering. The course is designed for those interested in doing research in data mining. Prereq: CSCI 479/679.

### 780 Methods of Optimization
Elements of convex analysis, constrained and unconstrained multi-dimensional linear and nonlinear optimization theory and algorithms, convergence properties and computational complexity. Prereq: CSCI 453/653. Cross-listed with MATH.

### 783 Topics in Software Systems
Includes an area of computer science not otherwise treated in computer science courses. Varies each time offered. May be repeated.

### 785 Topics in Computer Architecture
Includes an area of computer architecture not considered in other courses. Varies each time offered. May be repeated.

### 787 Topics in Operations Research
Includes an area of operational research not considered in other courses. Varies each time offered. May be repeated.

### 789 Topics in Theoretical Computer Science
Includes an area of theoretical computer science not considered in other courses. Varies each time offered. May be repeated.

### CONSTRUCTION MANAGEMENT AND ENGINEERING (CM&E)

<table>
<thead>
<tr>
<th>COURSE</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>101 Introduction to Construction Management and Engineering</td>
<td>1</td>
</tr>
<tr>
<td>200 Construction Documents and Codes</td>
<td>3</td>
</tr>
<tr>
<td>203 Building Construction: Methods and Materials</td>
<td>3</td>
</tr>
<tr>
<td>204 Construction Surveying</td>
<td>2</td>
</tr>
<tr>
<td>212 Construction Graphic Communications</td>
<td>3</td>
</tr>
<tr>
<td>240 Financial Cost Concepts for Construction Managers</td>
<td>3</td>
</tr>
</tbody>
</table>

### COURSES

<table>
<thead>
<tr>
<th>COURSE</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>111 Introduction to Construction Management and Engineering</td>
<td>1</td>
</tr>
<tr>
<td>200 Construction Documents and Codes</td>
<td>3</td>
</tr>
<tr>
<td>203 Building Construction: Methods and Materials</td>
<td>3</td>
</tr>
<tr>
<td>204 Construction Surveying</td>
<td>2</td>
</tr>
<tr>
<td>212 Construction Graphic Communications</td>
<td>3</td>
</tr>
<tr>
<td>240 Financial Cost Concepts for Construction Managers</td>
<td>3</td>
</tr>
</tbody>
</table>
250 Construction Statics and Mechanics
This course provides an introduction to the principles of statics and strength of materials with a focus on the behavior of structural components and systems in the construction industry. Prereq: MATH 165; Construction Management major.

301 Construction Technology and Equipment
This course provides a discussion of construction techniques; analysis of equipment costs; production; methods of equipment selection; earthwork; dewatering systems; and aggregate production. Prereq: CM&E 320. S

310 Construction Quality Control Management
2 Discussion of inspection procedures and requirements; design and management of quality control/assurance programs for design and construction phases of a project. Includes statistical quality control methods and total quality management in construction. 2 lectures. Prereq: Junior standing. Coreq: STAT 330 or IME 460. S

315 Specifications and Contracts
This course provides a discussion of various types of construction contracts; contract administration; specifications using CSI and AIA documents. 3 lectures. Prereq: Junior standing. F

320 Soils and Foundations
This course provides a discussion of the aspects of engineering and physical properties of soils; stress; settlement; consolidation; slope stability; earth pressure; bearing capacity; drainage; pore pressure; and foundations. 3 lectures, 1 three-hour laboratory. Prereq: CM&E 250. F

325 Fluid Mechanics for Technologists
3 Basic principles of fluid mechanics are introduced with an emphasis on topics pertinent to construction management students. Topics include fluid properties, fluid statics, fluid kinematics, energy and impulse-momentum considerations in fluid flow; pumping systems, steady uniform flow in open channels, fluid measurements, and forces on immersed bodies. Prereq: ME 221. S

370 Introduction to Cost Estimating
2 Includes plan reading, definitions of drawing symbols, and material takeoff for estimating quantities for a commercial construction project using the Construction Specifications Institute Technical Divisions 1 through 16. 2 lectures. Prereq: CM&E 200. F

380 Construction Estimating: Quantities and Costs
4 This course provides an introduction to the methods and techniques of conceptual and detailed construction estimating, including: quantity takeoffs; costs related to labor, materials, equipment, overhead and profit; and bidding strategies. Prereq: CM&E 200.

385 Construction Safety
2 This course provides an introduction to the planning and administration of construction safety programs, including: history and development of federal and state construction safety standards; methods for abatement and control of job site hazards to develop safe working environments. 2 lectures. S

403/603 Scheduling and Project Control
4 This course provides a discussion on the theories, principles, and techniques of construction planning and scheduling with an emphasis on time management, costs, and resources through the preparation and analysis of network schedules. Prereq: CM&E 380. F

409/609 Highway Construction
This course discusses the employment of the mechanistic-empirical design framework to the design and construction of rigid and flexible highway pavements, including: subgrade; base courses; surface courses; evaluation criteria (soil, climate, traffic, material and drainage); and construction/maintenance costs. Prereq: CM&E 320. S

411/611 Construction Cost Estimating
4 This course provides an advanced discussion of quantity takeoffs; labor, materials, equipment, and overhead costs; profit; and bidding strategies for construction projects. Prereq: CM&E 380. S

412/612 Construction Management Capstone
3 This course provides a discussion of the organization of project information; contract administration, project delivery systems; construction management methods; constructability review, value engineering; and construction productivity. Prereq: Senior standing. F

413 Construction Capstone
2 This capstone course provides students with hands-on design and construction activities. Computer applications. 3 lectures. Prereq: CM&E 489 and CE 489. Prereq: Senior standing.

420 Labor Productivity in Construction
3 This course focuses on the study of issues related to labor productivity; labor contracts and regulations; and labor resources. 3 lectures. Prereq: CM&E 315. Senior standing. S

421 Electrical and Mechanical Construction
3 This course provides an introduction to electrical and mechanical systems, the design and construction procedures used, code-based requirements, interaction with general construction and structural components, and spatial requirements. Prereq: PHYS 212, Senior standing. S

425/625 Decision Making and Risk Analysis
3 Decision-making and decision theory. Decision support systems, applied risk identification, and analysis in construction activities. Computer applications. 3 lectures. Prereq: CM&E 403. S

430/630 Land Development
3 This course provides an introduction to the practical applications of the planning, design, and construction phases of the land development process. Prereq: CM&E 204, 212 F

450 Steel Design for Technologists
3 This course provides a discussion of the selection and design of structural steel systems and methods of construction assembly. 3 lectures. Prereq: CM&E 250. F

453 Concrete Design and Construction
3 This course provides an introduction to the fundamental concepts of concrete construction from both design and construction perspectives. 3 lectures. Prereq: CM&E 250. S

455 Formwork Design
2 Design and construction of formwork structures for concrete structures. Computer applications. 2 lectures. Prereq: ME 223.

460/660 Infrastructure Management
3 This course provides an introduction to the methodologies, tools, and techniques of infrastructure management. Course topics focus on performance measures; deterioration modeling; life-cycle costs; optimization; budgeting; financial management; and policy analysis. Prereq: Junior standing.

465/665 Bridge Engineering and Management
3 This course provides an introduction to the planning, design, construction, and management concepts of structural steel and reinforced concrete bridges. Including: application of AASHTO LRFD specifications and latest developments in bridge management systems. Prereq: Senior standing.

470/670 Information Technologies for Construction Managers
3 This course provides an introduction to the applications and techniques of information technologies used in construction. Topics to include: operational concepts and computer software packages for estimating, scheduling, data management, CAD, and automation. Prereq: CM&E 200 and CM&E 212.

489 Construction Design Capstone
This course focuses on the design and construction aspects of an actual construction project. Prereq: Senior standing in Construction Engineering.

701 Construction Technology and Equipment
4 This course provides an advanced discussion of construction techniques; analysis of equipment costs; production; methods of equipment selection; earthwork; dewatering systems; and aggregate production. Prereq: CM&E 301.

705 Building Construction
3 This course provides an advanced discussion of the fundamentals of building construction, including building materials and construction methods for both residential and commercial structures. Prereq: CM&E 203.

710 Managing for Quality in Construction Organizations
3 This course provides an advanced study of total quality management and managing organizational dynamics for improvement, specifically related to construction companies. Prereq: CM&E 310.

715 Construction Specifications and Contracts
3 This course provides a discussion of the procedures used to prepare and administer construction specifications and contracts, including: Construction Specification Institute format, AIA Documents, General Conditions, and liabilities and incentives for various construction contracts. Prereq: CM&E 315.

720 Geotechnical Construction
3 This course provides an advanced discussion of the construction and management practices associated with geotechnical construction, including a variety of field applications for various geotechnical construction methods; a discussion of foundation construction; and the management practices related to geotechnical construction. Prereq: CM&E 320.

725 Underground Construction
3 This course provides a discussion of the design and construction of underground infrastructure systems, including: tunnels, microtunnels, shafts, trenchless technologies, drilling, tunnel boring, and ground stabilization. Prereq: CM&E 320.
740 Financial and Economic Concepts for Construction Managers  
This course provides an advanced discussion of financial management and the economic appraisal of construction projects, including: accounting systems, financial documents, managing costs and cash flow, setting profit margins for bidding, time value of money, and economic evaluation of projects. Prereq: CM&E 240.

753 Concrete Design and Construction  
This course provides a discussion of the fundamentals of concrete construction, including: the properties of Portland cement concrete; concrete quality control and application; concrete additives and curing; concrete placement; reinforcement; and current technologies of concrete construction. Prereq: CM&E 453.

775 Facilities Management  
This course provides an advanced discussion of the principles and practices needed to successfully construct and manage commercial, industrial and institutional facilities, buildings, and physical plants, from the perspective of a construction manager. Prereq: CM&E 412.

780 Construction Systems and Temporary Structures  
This course provides an advanced discussion of the planning, selecting and designing a variety of construction systems and temporary support and access structures, such as: formwork, falsework, earth retaining structures, cofferdams, diaphragms, dewatering, shotcrete, rigging, erosion and sedimentation, and blasting. Prereq: CM&E 301.

782 Public Infrastructure Management and Construction  
See Civil Engineering for description.

COUNSELOR EDUCATION (CNED)  
Buchholz, Hannon, Nelson, Nielsen, Sommer

COURSES  
(All courses require admission to the Counselor Education program.)

710 Counseling Techniques  
Basic principles and techniques in the counseling process. Emphasis given to counseling techniques from several counseling orientations.

711 Counseling Theory  
Study of various theories and philosophies of counseling and therapy.

712 Dynamics of Self  
Application of personality theory and the life stages to human behavior and the counseling process.

713 Assessment Techniques  
Techniques and procedures of studying the individual and diagnostic process in identifying client issues. Prereq: CNED 710, 711.

714 Career Counseling and Testing  
Study of theories of career development and the use of career information and testing in career counseling.

715 Professional Orientation and Ethics  
Introduction to dealing with professional and ethical responsibilities and multicultural issues in the counseling field.

716 Social and Cultural Foundations of Counseling  
Issues and trends in counseling with multicultural and diverse populations within our society. Prereq: CNED 710, 711.

720 Group Counseling  
Study of group counseling principles appropriate to various counseling settings including schools, treatment centers, and agencies. Includes a group experience. Prereq: CNED 710, 711.

723 Assessment and Diagnosis in Counseling  
Assessment and diagnostic procedures: how to use appropriate tools for accurate diagnosis and assessment, how to interpret assessment and diagnostic instruments, and how to make effective use of assessment results in counseling with clients.

725 Elementary School Counseling  
Exploration of models of elementary counseling and examination of counseling materials in implementing a counseling program.

726 Middle School Counseling  
Exploration of models for middle school counseling and examination of counseling materials for middle school counseling programs.

727 Secondary School Counseling  
Overview of principles and functions of a secondary school counseling program and examination of secondary school counseling materials.

728 Guidance Administration and Consulting  
Role of administrators, counseling personnel, and teachers in the management of and consulting in K-12 counseling programs.

730 Sexual Functioning and Abuse Issues in Counseling  
Study of sexual dysfunction, incest and abuse, and strategies of intervention and counseling with victims and perpetrators. Prereq: CNED 710, 711.

731 Counseling Children and Adolescents  
Counseling with children and adolescents including specific counseling strategies; mental, physical, and emotional development issues related to counseling. Prereq: CNED 710, 711.

732 Family Counseling  
Principles and techniques of family counseling, study of family dynamics, family systems, and theories of family counseling. Prereq: CNED 710, 711.

733 Marital Counseling  
Survey of marital counseling theories and techniques; analyses of dysfunctional communications. Prereq: CNED 710, 711.

734 Dynamics of Addiction  
Study of the theories and scope of addiction from the personal and social viewpoints with consideration given to the impact on the family. Prereq: CNED 710, 711.

763 Advanced Testing and Appraisal  
Theory, methods and techniques of assessment of client strengths and deficits will be examined. Common instruments used in counseling will be studied, as well as their administration and interpretation.

767 Advanced Group Counseling  
Theory and practice of group facilitation will be covered, building on the student's current expertise. Supervised practice in group work is included.

769 Theory and Practice for Counselor Educators  
Instructional models, educational techniques and the unique relationship between counselor educator and counseling student will be featured. Supervised experience in facilitating student learning will be included as well as feedback from the professor and fellow classmates.

770 Counselor Supervision  
Theory and practice of counselor supervision. Major schools of thought in counselor supervision will be examined, as well as the process of supervision and relationship between supervisor and supervisee.

771 Counselor Education and Supervision in a Multicultural Society  
An overview of becoming a professor in Counselor Education. The nature, scope and vista of being a scholar, educator, supervisor and practitioner in a multicultural context will be explored.

772 Advanced Counseling Theories  
An exploration of what constitutes the human condition. Appropriate components of good theory will be addressed and the major schools of thought within counseling theory will be surveyed.

776 Qualitative Research and Program Evaluation  
Major approaches in qualitative research in counseling and counselor education will be examined. Theory and practice issues will be included, as well as data analysis. Positivistic and non-positivistic approaches will be explored.

779 Quantitative and Survey Research  
In-depth analysis of theory, method and technique for conceptualizing and conducting quantitative research in counseling and counselor education will be examined. Survey design and methodology will be included.

780 Ethical and Legal Issues in Counselor Education  
Current challenges in counselor education regarding ethical and legal issues in the practice of counselor education and supervision. Equivalent to EDUC 757.

787 Professional Issues: Professional Development, Consultation and Publishing  
A seminar that addresses the following: needs of practitioners for professional development, both as consumers and providers; theory and practice of consultation; and, the process of developing, writing and submitting manuscripts for publication.
CRIMINAL JUSTICE (CJ)
Thompson, Chair; Archbold, Browning, McDonald, Stichman, Waid

COURSES

201 Introduction to Criminal Justice (CCN) 3
Examination of the criminal justice system and process. Includes crime, lawmaking, criminality, prosecution, police, courts, and corrections.

225 Punishment and the Death Penalty 1
Review of philosophical principles, policies, and procedures of punishment as used in the death penalty practices of the U.S.

226 Criminal Investigation (CCN) 2
Researches the process of gathering information and evidence in solving crimes. Focus on the role of evidence gathering and its importance to prosecuting cases and administering justice.

230 Criminology and Criminal Law 3
Study of criminal behavior and the measurement of crime and victimization. Major theories of crime causation and specific types of crime will be examined.

325 Applied Research Methods 4
See Political Science for description.

330 Criminal Law and Procedure 2
Examination of criminal law and procedure including search and seizure laws, rights of defendants and victims, and due process in criminal law.

406/606 Crime and Delinquency 3
Study of the nature and extent of juvenile delinquency. Analysis of causes of juvenile offending and an exploration of policies to combat delinquency. Prereq: Junior standing.

407/607 Deviant Behavior 3
Analysis of the precursors, the processes, and the consequences of deviance in Western society. Prereq: SOC 110 or PSYC 111. Cross-listed with SOC.

460/660 Criminalization 3
Analysis of historical and contemporary developments in the functions of police and courts. Focuses on societal, inter- and intra-organization contexts.

461/661 Corrections 3
Analysis of institutional and community-centered corrections. Emphasis on historical, contemporary, and developing trends regarding structures, program content, and problems.

489 Senior Capstone in Criminal Justice 1
Synthesis of criminal justice research, methods, and criminological theory. Prereq: Senior standing.

702 Program Evaluation 3
Examination of the development and implementation of criminal justice program/policy evaluation, including the techniques of applied research and practical considerations. Topics also include ethical issues, evaluation planning, process, impact and cost-benefits analyses, grant writing, and dissemination of findings.

703 Advanced Criminology 3
Advanced study of the distribution of crime and the major theories of crime causation from an interdisciplinary perspective, including special attention to issues relating to the measurement, nature, and extent of crime in the U.S.

707 Juvenile Corrections 3
Examination of the history of ideas about and responses to juvenile delinquency, the scope and nature historically and today, and the responses by various parts of the juvenile justice system, as well as responses by other social institutions such as the family, community and schools.

709 Criminal Justice Policy 3
Examination of concepts related to the development, implementation, and evaluation of public policy as it relates to the criminal justice system, including the history, development and operation of policing, courts/sentencing, corrections, crime prevention, offender rehabilitation, and issues related to drugs and crime and race and crime.

721 Individual Theories of Crime 3

722 Structural Theories of Crime 3
Review of historical and contemporary structural theories of crime, including criteria of good theory, the assumptions of various criminological theories, and the similarities and differences in theories. Prereq: CJ 703.

734 Advanced Criminal Justice Methods 3
Provides an examination of the research process. Explores how criminologists conduct research, pitfalls of research and importance of discovery and application. Prereq: Undergraduate methods course in social or behavioral sciences and a statistics course.

750 Violence 3
Examination of various aspects of criminal violence, including various social settings (e.g., community, domestic, and school) with attention to the causes, consequences, moderating factors and proposed solutions associated with violent criminal behavior.

752 Criminogenic Commodities 3
Examination of the role of drugs, guns, and gangs in contributing to crime. Analysis of the laws pertaining to drugs, guns, and gangs and their impact on criminality.

754 Criminal Investigations 3
Research on the process of gathering information and evidence in the administration of justice. Focus on the role of evidence gathering and its importance to dissemiinating justice.

755 Administrative Policing 3
Organizational theory, leadership, communication, labor relations, and crisis management in police administration.

757 Community Policing 3
Examination of the history, philosophy, theory, and implementation of community policing. Comparison of community policing styles with other policing styles.

759 Security Management 3
Examination of public and private security concerns and methods for addressing them. Analysis of protection of money, materials, information, and secrets.

760 Police and Race Issues 3
Provides an in-depth, historical, and contemporary view of the police and race issues in the United States. Discussions on diversity, use of force, racial profiling, and citizen complaints.

761 Police Effectiveness 3
Examines effectiveness of police delivery services in the U.S. Examines theories and scrutinizes factors that are associated with police effectiveness.

762 Community Corrections 3
Evaluation of practices, issues, and trends in community corrections. Focus on probation, parole, halfway houses, and other community alternatives to incarceration.

763 Correctional Rehabilitation 3
Examines issues related to the implementation and effectiveness of various correctional treatment approaches and programs. In-depth examination of the history, purpose and common targets of correctional treatment interventions.

765 Crime Prevention 3
Examination of the theoretical underpinning, implementation and effectiveness of crime prevention approaches within and outside of the traditional settings of law enforcement, courts and corrections, including schools, families, labor markets, and the community.

768 Gender and Justice 3
Examination of the role of gender in crime and the criminal justice system, including the changing roles of men and women in society, differential involvement in criminal behavior, and differential criminal justice response.

ECONOMICS (ECON)
Wahl, Chair; Back, Gustafson, Hearne, Herren, Koo, Kritsky, Lambert, Lim, Mack, McKee

COURSES

105 Elements of Economics (CCN) 3
Study of demand and supply, competitive and non-competitive markets, concepts of national income, unemployment, inflation, money, and fiscal and monetary policies. This course cannot be substituted for ECON 201 and 202. (ND:SS)

201 Principles of Microeconomics (CCN) 3
Nature, method, and scope of economic analysis; economic scarcity, resources, specialization of labor; supply-demand analysis; production and cost analysis; product and resource market structures; distribution of income; international trade. (ND:SS)

202 Principles of Macroeconomics (CCN) 3
Aggregate income and employment analysis; business cycles, unemployment, inflation and economic growth; fiscal policy; money and monetary policy; the U.S. economy and the world economy. (ND:SS)

324 Money and Banking 3
Institutional and theoretical framework of the financial structure including the banking system, Federal Reserve, money markets, and international monetary systems. Prereq: ECON 201, 202.

341 Intermediate Microeconomics 3
Analysis of markets in terms of efficiency, resource use, and economic welfare. Prereq: ECON 201, 202, MATH 146.

343 Intermediate Macroeconomics 3
Analysis of national output, business cycles, inflation, unemployment rates, interest rates, exchange rates, impact of monetary and fiscal policies, and economic growth. Prereq: ECON 201, 202.
410/610 Econometrics
Introduction to estimation, hypothesis-testing techniques and econometric applications in economics, with emphasis on ordinary least squares regression analysis. Use of econometric software reinforces econometric theory and methods through applications to econometric data. Prereq: ECON 341, STAT 330.

456/656 History of Economic Thought
Development of economic thought from the mercantilists to Keynesian economics. Prereq: ECON 341 or BUSN 451 and ECON 324 or 343.

461/661 Economic Development
Analysis of the main causes of economic development. Prereq: ECON 341 or BUSN 451.

465/665 Labor Economics
Theoretical analysis and survey of empirical studies relating to labor markets, human capital formation, and nature and causes of unemployment. Prereq: ECON 341 or BUSN 451.

470/670 Public Finance
Taxation, intergovernmental fiscal relations, and public expenditures; implications of various taxation policies. Prereq: ECON 341 or BUSN 451.

472/672 International Trade
Theories of international trade, payments, and foreign exchange markets. Prereq: ECON 341 or BUSN 451.

476/676 Monetary Theory and Policy
Analysis of relationships among money, credit, employment, price stability, and national monetary policy. Prereq: ECON 324 or 343.

480/680 Industrial Organization

481/681 Natural Resource Economics
Application of economic tools to evaluate natural resource policies. Concepts such as property rights, non-market goods, resource allocation over time, externalities, open access, and public goods are discussed in an intermediate micro-economics and calculus-based format. Prereq: ECON 341 or BUSN 451.

482 Environmental Economics
Application of economic tools to evaluate environmental policies. Topics include cost benefit analysis, regulatory versus market pollution control approaches, environmental damage assessment, and green accounting. Prereq: ECON 341 or BUSN 451.

485/685P Instructional Planning, Methods, and Assessment
Instructional Practices 3

486/686P Classroom Management for Diverse Learners
Examine and apply various classroom management and evaluation techniques to middle and high school levels. Prereq: EDUC 321, 322, 381, admission to School of Education.

487/687P Student Teaching

488/688P Applied Student Teaching
Guided student teaching experience including application of lesson planning, portfolio development, professional goal-setting, and supervised teaching in an approved and accredited school. Prereq: Admission to School of Education, completion of professional education sequence. Coreq: EDUC 485/685P or H&CE 483P, EDUC 487/687P. Cross-listed with H&CE.

489/689 Native Americans and Multicultural Instructional Practices
Admission to doctoral program.

702 Statistics in Educational Research
Basic theory; techniques for using descriptive and inferential statistics; application in educational research designs.

703 Research, Measurement, and Program Evaluation
Methodology and design of research studies; organization, reporting analysis, and interpretation of research.

705 Teaching College Science
See Biological Sciences (Biology) for description.

710 Philosophy of Education
Major philosophical concepts and principles of education from Plato to the present.

712 Social, Cultural, and Political Dimensions of Schools
Social processes and interaction among diverse populations in educational settings. Relationship of schools to society.

714 History of American Education
Historical and intellectual development of education in the United States from the colonial period to the present.

715 The Superintendency
This course deals with examining the role and functions of the public school district administrator.

716 Comparative Education
Analysis of educational systems of selected nations, including emerging and economically developed countries.

717 Adult Learning
Includes recent research concerning adult learning in the context of planning and operating effective adult education programs.

718 Community Education
Study of the theory base on which community education is founded. Consideration is given to implementing the concept in the community with available resources.

719 Planning and Conducting Needs Assessment
A three-phase model will be compared and contrasted to provide the skill and knowledge necessary for conducting needs assessments for educational schools and institutions. Prereq: Admission to doctoral program.

720 Supervision of Student Teachers
Planning and carrying out effective supervision techniques when supervising student teachers in respective subjects.

721 Assessment Techniques for Educational Institutions
This course addresses all aspects of educational assessment in order to select the assessment technique that meets specific accountability mandates in the field of education. Prereq: Admission to doctoral program.

722 Instructional Systems, Media, Materials
Preparation of instructional systems in support of a variety of teaching techniques and alternative media approaches.

723 Diversity and Educational Policy
The purpose of this course is to help educators understand ethnic and racial identity formations among high school and college students of racially mixed heritage. Prereq: Admission to doctoral program.

724 Advanced Educational Psychology
Principles of effective human learning. Discussion of learning theories, the teacher as a director of learning experiences, and factors in students representing a variety of cultures and abilities in the educational setting.

725 Institutional Analysis Techniques
Surveys, focus groups, longitudinal studies, national data sets, correct statistical design and analyses, and effective reporting techniques will be reviewed and utilized in depth to address questions of institutional performance in academic and student affairs. Prereq: Admission to doctoral program.

727 Higher Education Law
To develop expertise in legal issues for students whose current positions or future career goals include administrative and management positions in higher education where they will work on legal issues with attorneys. Prereq: Admission to doctoral program.

728 Instructional Technology for Teaching and Learning
This course provides an advanced understanding of technology concepts and contemporary computer-based programs for the teaching and learning processes. Prereq: Admission to doctoral program.

729 Organization and Administration of Telecommunication Technologies
This course provides the procedures for developing videoconferencing training materials to prepare faculty, students and staff to effectively use the videoconferencing equipment both for meetings and instruction. Prereq: Admission to doctoral program.

730 Leadership, Planning, and Organizational Behavior
Introduction to models of educational leadership including organizational structure, theory, and leadership styles. Consideration of concepts, problems, and issues in administration.

731 Educational Law and Organizational Structure of Schools
Examination of the legislative and judicial actions affecting the public schools. Consideration is given to contemporary legal issues for teachers, administrators, and boards.

732 Curriculum, Instruction, and Learning Theory
Investigation of curricular decision-making and program evaluation strategies as they affect the educational program. Problem-solving skills are presented through theory and simulation.

733 Technology and Information Systems
Provides an understanding of selected computer applications for educational administrators at the building and district office levels.

734 Personal Communications and Ethics
Prepares aspiring school leaders to plan for their personal and professional development and to understand and use the principles of communication, ethics, and values.

735 Personnel, Supervision, and Staff Development
Specific techniques and systems to supervise instruction. Review of interpersonal communication and group process skills as applied to administrative supervision.

736 Policy and Educational Finance
Provides school leaders with an understanding of managing and allocating resources in a political climate in which policy decisions are based on historical resource allocations.

737 The Helping Relationship and the Elderly
The theoretical foundations and the techniques of the helping relationship between the helper and people of advanced age will be studied and applied.

738 Administration of Elementary Schools
Common elements of leadership as they apply to the principalship. Consideration of practical applications in an elementary school setting.

739 Administration of Secondary Schools
Common elements of leadership as they apply to the principalship. Consideration of practical applications in a secondary school setting.

740 Financing Higher Education
This course provides funding theories and procedures necessary to develop and maintain financing for higher education institutions. Prereq: Admission to doctoral program.

741 Higher Education Student Affairs and Enrollment Management
The purpose of this course is to teach about the role of student affairs professionals in schools, colleges, and other educational organizations, including recruitment, selection, orientation, development, compensation, and evaluations. Prereq: Admission to doctoral program.

742 Elementary School Curriculum
History, development, evaluation, and revision of the curriculum. Review of recent research in elementary school curriculum.

743 Secondary School Curriculum
Study of contemporary curriculum patterns with emphasis on curricular construction and evaluation.

744 Administration of the Middle School
Organization and administration of educational programs for early adolescents with special consideration given to block scheduling, interdisciplinary teams, and advisor-adviser problems.

745 Program Evaluation Research
Major theoretical approaches to the evaluation of educational programs are reviewed, analyzed, and critiqued. Pragmatic implications for educational and social policy are addressed, as well as constructive impact on program decision-making. Prereq: Admission to doctoral program.

746 Institutional Quality Control
History and effecting of quality control will be briefly reviewed. Global, U.S. societal, state government, accreditation, and student accountability forces will be elucidated. Successful, failed, and future institutional responses to these forces will be discussed. Prereq: Admission to doctoral program.

748 Collective Bargaining and Negotiation in Education
Study of the principles and processes of collective bargaining in public educational institutions. Development of negotiation skills through participation in simulations.
749 Case-Based Educational Research and Statistics 3
The purpose of this course is to have graduate students understand statistical meanings and concepts that will provide the professional expertise needed to serve schools and institutions with their contemporary research and accountability needs. Prereq: Admission to doctoral program.

750 Reflective Practice and Research in Education 3
An examination of teaching and professional practice based on reflective practice. Analyze educational research as related to and informs practice.

751 Students and Their Learning 3
Exploration of student differences and ways of adjusting teaching practice to meet individual needs. Application of learning theories to educate the whole child (cognitive, affective, social). Equitable treatment of students.

752 Curriculum Design and Delivery 3
An inquiry-based course for the reflective practitioner to develop deep understandings of curriculum content emphasized by state and national standards documents and to acquire an effective repertoire of instructional skills.

753 Managing and Monitoring Learning 3
This course is based on the concept that assessment drives instruction. A working definition of student learning will be defined. Multiple measures of assessment will be investigated and impacts on student learning will be explored.

755 Exceptional Learners in the Secondary School Classroom 3
Legal and ethical requirements for educating exceptional learners; identification, referral, and placement procedures; development and use of the Individual Education Program; strategies for teaching and evaluating managing academic and social behaviors of exceptional learners.

763 Education and Training for Business and Industry 3
The purpose of this course is to teach the fundamentals necessary to educate and train people for the workforce according to evolving training needs of business, industry, military and government. Prereq: Admission to doctoral program.

767 Organization and Administration of Higher Education 3
This course deals with the organization and administration of higher education and the current and evolving problems and possibilities for higher education. Prereq: Admission to doctoral program.

769 Politics and Policy Analysis in Education 2
The purpose of this course is to examine political and policy development in American public education in order to understand current local, state, and national issues. Prereq: Admission to specialist program.

770 Empowerment and Advocacy in Human Development and Education 3
An examination of theory, research, and practice in individual and group empowerment and advocacy in the multi cultural and diverse contexts that contemporary human beings find themselves.

771 Structural and Equation Modeling Fundamentals 3
This course is designed for faculty and doctoral-level students who need a significant familiarity with those statistical techniques known collectively as "structural equation modeling." Prereq: Admission to doctoral program.

772 Curriculum and Instructional Development 3
A five-phase model will be compared and contrasted to provide the skill and knowledge necessary to establish a systematic curriculum and instructional development. Prereq: Admission to doctoral program.

775 Content Area Reading 2
Examination of content, instructional methodologies, and evaluation techniques for reading in content classes.

776 Qualitative Research and Program Evaluation 3
The purpose of this course is to address theory and practice approaches in qualitative research for education settings that include data analysis, content analysis, interpretive analysis, positivistic, and non-positivistic. Prereq: Admission to doctoral program.

777 Tort Liability 2
Examination of the legal liability of teachers, administrators, and public school boards for injurious intentional or unintentional acts. Prereq: EDUC 731.

778 School Fund Management 3
Proper recording and reporting of financial accounts for elementary and secondary schools; Use of procedures and concepts for governmental fund accounting and financial management. Prereq: M.S. in Educational Administration.

779 Quantitative and Survey Research 3
The purpose of this course is to have an in-depth analysis of theory, method, and technique for conceptualizing and conducting quantitative research, survey design and methodology in educational leadership. Prereq: Admission to doctoral program.

780 Instructional Models 2
Investigation of current practices and trends in instructional models. Emphasis is on the relationship of current research to contemporary practice.

781 Science Teaching and Curriculum 3
Overview of recent research on science teaching, learning, and curriculum. Special attention given to contemporary theories on science teaching models that enhance student understanding.

782 Supervisory and Administrative Theories 4
Study of management models and techniques, needs assessment, goal setting, planning and evaluation systems, and decision-making problems as they relate to the school improvement process. Prereq: EDUC 732.

783 Computer Data Management and Decision Making 2
Interpretation of effective computer applications for computer use as a decision-making and planning tool for school finance and managerial functions relating to the field of school business administration and school district superintendence. Prereq: EDUC 730, 10 credits in Educational Administration.

784 School Personnel Administration 2
Study of personnel administration in public school systems. Includes an examination of the purposes, policies, plans, procedures, and personnel administration. Prereq: EDUC 782.

785 Organization and Administration of Vocational/Technical Education 2
Overview of the vocational education services of local educational agencies and their relation to post-secondary education. Emphasis on planning, organizing, administering, and managing resources.

786 School Facility Planning 2
Overview of the principles in planning, construction, and maintenance of school buildings. Visits to educational facilities and the assessment of school buildings. Prereq: M.S. in Educational Administration

787 Issues in Education 2
This course delves into the issues of why a person would pursue a doctoral degree in light of the current issues facing educators. Helps define a professional course of study available in respect to educational issues. Leads to studying creators and leaders in different realms by people who have special interest in creativity and ethical pursuits.

788 School Finance and Business Management 4
Overview of school fund revenues and expenditures pertaining to local, state, and federal funding. Includes in-depth study of the practices of school business administration pertaining to all fund activities in instruction and ancillary operations.

789 School Community Relations 2
Purposes, organization, agencies, and criteria of good school-community relationships; knowledge and techniques for effective public relations. Prereq: EDUC 739, M.S. in Educational Administration.

ELECTRICAL AND COMPUTER ENGINEERING (ECE)

111 Introduction to Electrical and Computer Engineering 3
Introduction to electrical and computer engineering problem solving, design and professional issues. 3 lectures. Prereq: MATH 105, F

173 Introduction to Computing 3
Programming in a high level language with applications to engineering computation, analysis, and design. 3 lectures, 1 recitation. Prereq: MATH 105. F, S

EE 206 Circuit Analysis I (CCN) 4
Linear electric circuits. Component models, circuit laws, transient analysis, design issues, computer tools. 3 lectures, 1 two-hour recitation/laboratory. Prereq: MATH 129, 166 with a grade of C or better. Coreq: PHYS 252. F, S

275 Digital Systems I 3
Introduction to number systems, combinational circuits, and sequential circuits. 3 lectures. Prereq: MATH 103, Cross-listed with CSCE 111. F, S

301 Electrical Engineering I 3
Introduction to electrical engineering for non-majors. Fundamental laws of circuit analysis. Steady-state and transient analysis of DC and AC circuits. 3 lectures. Prereq: MATH 259 or 265, PHYS 252. F, S

303 Electrical Engineering II 3
Electronic circuits and their applications. Electromechanical energy conversion. Transformers, DC and AC machines. 3 lectures. Prereq: ECE 301, F, S
306 Electrical Engineering Lab I 1
Electronic instruments and measurements. Applications to electrical and electronic circuits, power devices, and systems. 1 two-hour laboratory. Coreq: ECE 303, F, S

311 Circuit Analysis II 4
Analysis of single-phase and three-phase circuits. Laplace transforms in circuit analysis. Fourier series. Two-port networks. 3 one-hour lectures, 1 two-hour laboratory. Prereq: EE 206 with a grade of C or better. Coreq: MATH 266, F, S

321 Electronics I 5

331 Energy Conversion 4
Magnetic circuits, transformers, DC and AC rotating machines. 3 one-hour lectures, 1 two-hour laboratory. Prereq: ECE 311, S

341 Random Processes 3
Principles of probability. Application of probability and statistics to electrical and computer engineering problems. 3 lectures. Prereq: ECE 311. S

343 Signals and Systems 4
Discrete-time and continuous-time signals and systems. Linearity, frequency response, difference and differential equations, transfer functions. 4 lectures. Prereq: ECE 311. F, S

351 Applied Electromagnetics 4
Lecture and laboratory introduction to electromagnetic waves in linear media, effects of boundaries, transmission lines, electrostatics, and magnetostatics. Introduction to time dependence and engineering applications. 4 lectures, 1 two-hour laboratory. Coreq: ECE 311. F, S

373 Assembly Programming 3
See Computer Science for description. Prereq: ECE 173, 275 with a grade of C or better.

374 Computer Organization 3
See Computer Science for description. Prereq: ECE 173, 275 with a grade of C or better.

375 Digital System Design and Implementation 3
Experience with digital system design and prototyping, including use of digital laboratory equipment. 2 lectures, 1 two-hour laboratory. Prereq: ECE 173, 275 with a grade of C or better, F

376 Embedded Systems 4
Use of microcontrollers for data acquisition and device control. Includes assembly language and high-level programming, serial and parallel I/O, timers and interface design. 3 lectures, 1 two-hour laboratory. Prereq: ECE 173, 275, EE 206 with a grade of C or better, F, S

401 Design I 1
Capstone experience in formulation and design of a system or device. Basic project planning and software tools. 1 lecture. Prereq: ECE 321, F, S

403 Design II 2
Capstone experience in formulation and design of a system or device. 2 two-hour design laboratories. Prereq: ECE 401, Senior standing in program. F, S

405 Design III 3
Capstone experience in formulation and design of a system or device. 3 two-hour design laboratories. Prereq: ECE 403, Senior standing in program. F, S

411/611 Optics for Scientists and Engineers 4
See Physics for description.

411L/611L Optics for Scientists and Engineers Laboratory 1
See Physics for description.

417/617 Optical Signal Transmission 3
Optical signal transmission including geometric optics and modal analysis for homogenous and inhomogeneous light guides. Systems studies including coupling, inter-symbol interference, sources, photodetectors, and modulation. Prereq: ECE 351, S/2

421/621 Communication Circuits 3
Reonant circuits and tuned amplifiers, oscillators, modulators and demodulators, phase-locked loops, and power amplifiers. Analysis, design, and applications in communication systems. 3 lectures. Prereq: ECE 321, S

423/623 VLSI Design 3
Analysis and design of digital integrated circuits. Characteristics and applications of logic gates and regenerative logic circuits. 3 lectures. Prereq: ECE 321, S

425/625 Introduction to Semiconductor Devices 3
Properties and applications of semiconductors and solid-state electronic devices. Semiconductors, junctions, and transistors. 3 lectures. Prereq: ECE 321, 351, F/2

431/631 Power Systems 3
Electrical characteristics of high voltage lines. Symmetrical components, per unit system, and transformers. Matrix methods, load flow, and fault analysis. 3 lectures. Prereq: ECE 311. F

432/632 Computational Methods in Power Systems 3
Power flow, optimal power flow, state estimation, contingency analysis, unit commitment, security assessment, small signal and dynamic stability, voltage stability, emerging algorithms for blackout and vulnerability assessment in power systems. Coreq: ECE 431.

433/633 Power Systems Design 3
Unbalanced power systems, economic dispatch, transients in power systems, power system stability, power system protection. 3 lectures. Prereq: ECE 311. S

437/637 Power Electronics 3
Characteristics and modeling of power electronic devices. Rectifiers, choppers, and inverters and their applications in power supplies and motor drives. 3 lectures. Prereq: ECE 321. F

443/643 Communications I 4
Communications theory and design with an emphasis on spectral techniques. Modulation and noise effects. 3 lectures, 1 two-hour laboratory. Prereq: ECE 343. Coreq: ECE 341, F, S

444/644 Applied Digital Signal Processing 3
Digital signal processing theory balanced with practical application. Includes design of FIR, IIR, and adaptive filters; Fast Fourier Transforms; sampling theory; implementation techniques; multi-rate processing. Emphasizes system implementation using development tools and DSP hardware. 3 lectures. Prereq: ECE 173 with a grade of C or better, 343, F

445/645 Communications II 3
Continuation of ECE 443. Digital communications systems. Optimum receivers. Information theory and coding. 3 lectures. Prereq: ECE 443. S/2

448/648 Image Analysis I 3
Image acquisition, resolution, enhancement, restoration, and equalization. Illuminations, reflectance, and noise considerations. Segmentation, shape characterization, and object recognition. Simulation examples, computer problems, and gathering of actual scientific images via camera and computer. Prereq: ECE 343. (alternate years)

453/653 Signal Integrity 3
Topics in system level signal integrity are presented. The construction and design of passive printed circuit cards are discussed, with computer aided design software used for analysis and class presentations. Circuit card fabrication issues and case examples of applications are discussed. Prereq: ECE 311, 351. F/2

455/655 Designing for Electromagnetic Compatibility 3
Principles and methods concerning electronic system designs that are not sources of or susceptible to electromagnetic interference. 3 lectures. Laboratory. Prereq: ECE 343, 351. F/2

461 Control Systems 4
Analysis and design of control systems. Controller design to meet time and frequency specifications. 3 lectures, 1 two-hour laboratory. Prereq: ECE 343. F

463/663 Digital Control 3
Analysis and design of sampled-data control systems including z-transforms, sampling theory, design to specifications, controllability, observability, stability, and optimization. 3 lectures. Prereq: ECE 461.

470 Digital Systems II 3
Design and analysis of reliable digital systems through robust information coding, fault avoidance, and fault-tolerance. 3 lectures. Prereq: ECE 275 with a grade of C or better, F

471 Computer Systems Design and Implementation 3
Design and implementation of reliable, interrupt driven systems. Use of development tools. System components issues including co-processors, buses, run-time. Prereq: ECE 576, 401, CSCI 474. S

483/683 Instrumentation for Engineers 3
Study of instrumentation including design, fabrication, and application. Prereq: Senior standing, F

485/685 Biomedical Engineering 3
Unified study of engineering techniques and basic principles in physiological systems. Focus on membrane biophysics, biological modeling, compartmental analysis, and systems control theory. Prereq: Senior standing, F
Course Descriptions

487/687 Cardiovascular Engineering
This course includes the application of engineering techniques to cardiovascular physiology and medicine. Basic cardiac and vascular physiology will be presented, modeling techniques will be examined. Instrumentation, measurement theory, and assist devices will be discussed. Prereq: Senior standing. S

701 Advanced Engineering Problem Solving
Application of advanced mathematical and computational methods to engineering problems. 3 lectures. S

702 Advanced Research Topics
Prepare the student in finding a major adviser; defining the research questions or objectives; beginning a literature search; learning how to prepare a manuscript and/or grant application with their major adviser. F

703 Advanced Teaching and Classroom Topics
To help prepare the Ph.D. student for the challenge of teaching in a classroom. F

721 Integrated Circuits
Introduction to CMOS circuits. Circuit characterization and performance estimation. CMOS circuit and logic design, CMOS testing, CMOS subsystem design. 3 lectures. Prereq: ECE 423/623.

723 Advanced Electronics
Characteristics and detailed modeling of operational amplifiers. Applications to waveform generation, analog multiplication, modulation, and data conversion. IC and special amplifiers. 3 lectures. Prereq: ECE 421/621. (alternate years)

731 Power System Protection
Power system protective relaying. Generator, transformer, line, bus, motor protection. 3 lectures. Coreq: ECE 433/633. S

733 Power Distribution
Power distribution systems. Lines and transformers, characteristics of loads, voltage drops and corrective measures, lightning protection. Fault analysis, fuses, reclosers, sectionalizers. Power system harmonics and power quality. 3 lectures. Coreq: ECE 431/631. F

741 Signal Processing I

743 Signal Processing II

745 Statistical Communications
Advanced topics in communications theory including detection theory, estimation theory, and information theory. 3 lectures. Prereq: ECE 443/643. S

748 Elements of Information Theory
This course will cover: entropy, asymptotic equipartition property, data compression, channel capacity, differential entropy, the Gaussian channel, an introduction to rate distortion theory and network information theory.

751 Electromagnetic Theory and Applications
Theory of radiation, antenna characteristics, complex waves, potential functions and spectral domain methods for wave guides and cavities, and dispersive media. 3 lectures. S

755 Advanced Topics in Electromagnetics
Topics of current interest in electromagnetics, micro-waves, and optics. 3 lectures. Prereq: ECE 751. S

761, 763 Advanced Control Theory I, II
State variable formulation of the control problem; system identification. Introduction to adaptive, distributed, multivariable, nonlinear, optimal, and stochastic control. Prereq: ECE 461, 761 respectively.

774 Computer Architecture
Processor operations, computer arithmetic, control mechanism, instruction sets, classification schemes, pipelining, parallel processing, hierarchical memory and memory management, I/O methods and interrupts, and interconnection buses. 3 lectures. Prereq: ECE 374.

775 Hardware for Cryptography
This course covers the mathematical background, modern cryptographic techniques like block ciphers, hash functions and public-key cryptosystems. Hardware and embedded implementations of cryptosystems and recent research in hardware implementation are also covered. Prereq: CSCI 469/669, ECE 341, 423, 470.

778 Computer Networks
Examination of computer networks using the ISO-OSI model as a framework. Exploration of practical and theoretical issues in modems, codes, error, impairments, modulation, protocols, and interfaces. 3 lectures. Prereq: CSCI 474. (alternate years)

EMERGENCY MANAGEMENT (EMGT)
Klenow, Chair; Cwiak, Yoon, Youngs

COURSES

101 [201] Emergencies, Disasters, and Catastrophes
An overview of emergencies, disasters, and catastrophes from a social, political, historical, policy, environmental, international and cross-cultural perspective. Focuses on differences in these events in terms of scale as well as cause from the disaster phase approach.

210 Emergency and Disasters: A Visual Approach
This course studies emergencies and disasters through documentaries and feature films highlighting technological and anthropogenic causes, consequences and management issues. Special attention will be placed upon emergency response operations.

261 Disaster Preparedness
Nature and rationale for public awareness of potential hazards that communities face, preparedness for these hazards, and potential strategies to mitigate adverse consequences. Prereq: EMGT 101.

262 Disaster Mitigation
Role of emergency management programs in community resilience and sustainability; incorporation of preparedness, mitigation, response, and recovery in community comprehensive and strategic planning.

263 Disaster Response
Principles and procedures related to emergency operations plans, warning, evacuation, search and rescue, mass casualty care, sheltering, donations, management, disaster declaration, and incident debriefing. Prereq: EMGT 101.

264 Disaster Recovery
Examination of post-disaster policies and programs that protect the natural environment, improve disaster resistance, support diverse populations, improve economic conditions, and preserve community resources. Prereq: EMGT 101.

411/611 Community Disaster Preparation
Nature and rationale for public awareness of potential hazards that communities face, preparedness for these hazards, and potential strategies to mitigate adverse consequences.

413/613 Building Disaster Resilient Communities
Role of emergency management programs in community resilience and sustainability; incorporation of preparedness, mitigation, response, and recovery in community comprehensive and strategic planning.

414/614 Spatial Analysis in Emergency Management
This course is designed to provide emergency management students with specific disaster related applications of spatial analysis techniques in state of the art GIS software. Prereq: EMGT 101 and any one of the following: EMGT 261, 262, 263 or 264.

415/615 Rural Society and Emergency Management
Application of emergency management principles and procedures of disaster preparedness, mitigation, and response and recovery in the rural context.

431/631 Disaster Response Operations and Leadership
Principles and procedures related to emergency operations plans, warning, evacuation, search and rescue, mass casualty care, sheltering, donations management, disaster declaration, and incident debriefing.

451/651 Floods, Blizzards, and Tornadoes
Role of emergency management in floods, blizzards, and tornadoes: response of local, state, and federal governments and agencies to these conditions.

453/653 Emergency Management Law and Regulation
This course examines legal principles, policy and regulation that impact emergency management, including both the provision of care and services and the management of services. Prereq: PHIL 210.

461/661 Business Continuity and Crisis Management
This course provides an overview of planning and management principles applicable to business or operational resumption following an emergency. The emphasis will be on minimizing the impact of a disaster on business operations.

463/663 Voluntary Agency Disaster Services
Examination of the roles played by local, state, national, and international voluntary agencies in emergency preparedness, mitigation, response, and recovery.

464/664 Disaster and Culture
See Anthropology for course description.


481/681 Disaster Analysis
Examination of natural and human-made disasters from a multidisciplinary perspective.

483/683 Holistic Disaster Recovery
Examination of post-disaster policies and programs that protect the natural environment, improve disaster resistance, support diverse populations, improve economic conditions, and preserve community resources.

489 Capstone in Emergency Management
Integrate course work taken in Emergency Management major; apply emergency management principles to real world events; and explore career and graduate options in the field of emergency management. Prereq: Senior standing.

712 Hazards Risk Assessment Theory and Practice
Examination of natural and human-made disasters from a risk assessment perspective, and preparedness and control procedures for each of these types of disasters.

714 Hazardous Materials Regulation
Hazardous materials contingency planning and environmental regulations at the community, state, and federal levels.

720 Emergency Management Theory
This course reviews the theoretical assumptions and foundation of disaster management from the interpersonal, small group, organization and societal levels.

721 [621] Hazard Mitigation Theory and Practice
Examination of disaster mitigation theory and the rationale and context of mitigation programs, processes, and planning. Students will acquire both theoretical and applied understandings of mitigation principles and practices. Prereq: EMGT 413/613.

730 Advanced Research Methods
This course reviews qualitative and quantitative methodologies and provides additional depth on their application to emergency management research projects. Prereq: SOC 700, 701.

732 Disaster Response Theory and Practice
Examination of theory and practice in the relationship between incident command systems and emergency operating centers.

782 Damage Recovery Theory and Practice
Theory, principles, and procedures used in disaster damage assessment and in emergency supply and service dissemination.

**ENGINEERING (ENGR)**

Smith, Dean

**COURSES**

111 Introduction to Engineering
Designed to provide general engineering students with an opportunity to review, study, discuss, and evaluate various engineering professions as career choices. F, S

310 Entrepreneurship for Engineers and Scientists
How to turn a great idea into a business by starting a company and/or profiting from a new invention. Developing a product, conducting patent searches, securing intellectual property rights, writing a business plan, obtaining financing, etc. are covered. F

311 History of Technology in America
Development of tools, technology, and whole systems, especially the U.S. experience since 1700. Contributions of Jefferson, Richards, Edison and others as models of creativity as a foundation for the emergence of modern conceptions of progress.

312 Impact of Technology on Society
Study of the impact of technology on the natural environment; discussion of values, ethics, citizenship, social responsibilities, and the relationship of humans to the environment.

320 Technical Communication
Application of written and oral aspects of technical communication geared especially toward the engineering profession. Students create documents and presentations for a variety of audiences and purposes. 3 recitations. Prereq: ENGL 110. F, S

402 Engineering Ethics and Social Responsibility
Philosophical basis for ethical decisions, guidance for ethical decision making in engineering practice, ethics of social responsibility, professionalism, case studies, and codes of conduct for engineers. F, S

489 Collaborative Engineering Capstone
Integration of engineering and architecture topics and job functions projects. Students will plan, design, develop, verify, produce/construct/service facilities and systems created to fulfill industrial, agricultural, urban, and business needs. Prereq: Senior standing and major departmental approval. F, S

715 Engineering Systems
Interdisciplinary systems analysis approach to engineering problems. Mathematical and physical stochastic process and control systems.

741 Systems—Linear and Nonlinear Concepts
Nonlinear and linear programming methods for engineering design optimization. Formulation and optimization of design problems from all areas of engineering.

762 Heat and Mass Transfer

770 Quantitative Modeling

771 Probabilistic and Deterministic Methods
Applications modeling. Domains include transportation, logistics, manufacturing, service systems scheduling, and supply-chain management. Quantitative models and tools include Markov chains, stochastic processes, queuing, deterministic and stochastic decision analysis, time series, forecasting, and regression modeling. Prereq: MATH 265, IDEM 460/660.

780 Electromagnetic Theory
Physical concepts and mathematical solutions of Maxwell equations; boundary conditions, force, and energy equations; potential equations; Green’s functions; wave equations, radiation, and propagation of electromagnetic waves. F/2

789 Advanced Research Methods in Engineering
Advanced study of the philosophy, reasoning, design, methods, and procedures employed in conducting and disseminating scientific research. Includes a survey of current and original research with interpretation and assessment.

**ENGLISH (ENGL)**

Sullivan, Head; Birmingham, Brooks, Brown, Cavins, Ebert, Fricke, Hanson-Dittmer, Heilborn, Johnson, Johnston, Krishnan, M. Mara, M. Mara, Maylath, McEnery, Nichols, O’Connor, Pull, Rupiper Sandland, E. Sassi, K. Sassi, Scott, Taggart, Temanson, Theile, Totten, Trump, Tunstall, Veesen

**COURSES**

110 College Composition I (CCN)
Guided practice in college-level reading, writing, and critical thinking. Includes process writing and an introduction to library research. (ND:ENGL)

111 Honors Composition I (CCN)
Accelerated reading, writing, and critical thinking designed to enhance qualified students' well-developed skills of language use. Requires enrollment in the Scholars Program. Equivalent to ENGL 110. (ND:ENGL)

112 ESL College Composition I (CCN)
Guided practice in college level reading, writing, and critical thinking, with special attention to the issues of usage encountered by non-native speakers of English. Includes process writing and an introduction to library research. Equivalent to ENGL 110.

120 College Composition II (CCN)
Advanced practice in college-level writing from sources and in applying rhetorical strategies. Requires library research and use of summaries, paraphrases, and quotations from relevant sources in analysis and persuasive essays. Prereq: ENGL 110. (ND:ENGL)

121 Honors Composition II (CCN)
Accelerated practice in college-level writing for qualified students with skills in research and argumentation. Essays using library research and summaries, paraphrases, and quotations from relevant sources. Requires enrollment in the Scholars Program. Equivalent to ENGL 120. Prereq: ENGL 111. (ND:ENGL)

122 ESL College Composition II (CCN)
Guided advanced practice in college level writing from sources and in rhetorical strategies, with additional support related to higher level language acquisition and usage for non-native speakers of English. Equivalent to ENGL 120. Prereq: ENGL 112.

167 Introduction to English Studies (CCN)
An introduction to the different areas of English studies including literature, writing studies, and linguistics and the ways in which they are studied.

209 Introduction to Linguistics (CCN)
Entry-level knowledge for the scientific study of language, including such topics as phonetics, phonology, morphology, semantics, grammar, social and cultural dimensions, acquisition, variation and similarities among languages of the world, and related cultural history. Cross-listed with ANTH.

213 Literary Publications (CCN)
Theory and practice in the process of producing a literary magazine. Prereq: ENGL 120.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>Introduction to Literature (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Reading and discussion of representative examples of poetry, drama, and fiction, with emphasis on the use of common literary terminology. Classic and contemporary works. Focus on enjoyment and appreciation of verbal art. (ND:HUM)</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>Examination of poetic forms including the use of figurative language and the techniques of rhythm and meter, as well as imagery and structure. Includes traditional and contemporary lyrics.</td>
<td></td>
</tr>
<tr>
<td>202</td>
<td>Introduction to Poetry (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Examines the system of the English sentence. Emphasis on structures and components with attention to application in teaching, stylistic analysis, and editing.</td>
<td></td>
</tr>
<tr>
<td>203</td>
<td>Introduction to Film (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>General introduction to film studies, including analysis of narrative and stylistic elements of films for their artistic merits and their reflection of an influence on society. (ND:HUM)</td>
<td></td>
</tr>
<tr>
<td>204</td>
<td>The Poetry of Rock (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Examination of rock lyrics as contemporary poems, using techniques of literary criticism to analyze their themes, their aesthetic principles, and their place in art and culture.</td>
<td></td>
</tr>
<tr>
<td>205</td>
<td>World Literature Masterpieces (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Study of representative cultural and literary materials from the ancient world to modern times.</td>
<td></td>
</tr>
<tr>
<td>206</td>
<td>British Literature I (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Survey of major works and writers in British literature from the Anglo-Saxon period through the 18th century. (ND:HUM)</td>
<td></td>
</tr>
<tr>
<td>207</td>
<td>British Literature II (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Survey of major works and writers in British literature from the Romantic Age to the present. (ND:HUM)</td>
<td></td>
</tr>
<tr>
<td>208</td>
<td>American Literature I (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Survey of major works and writers in American literature from the colonial period through the Civil War. Emphasis on the development of unique American values and literature. (ND:HUM)</td>
<td></td>
</tr>
<tr>
<td>209</td>
<td>American Literature II (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Survey of major works and writers in American literature from the Civil War to the present. Includes traditional as well as experimental, innovative, and counter-cultural works and authors. (ND:HUM)</td>
<td></td>
</tr>
<tr>
<td>210</td>
<td>Literary Analysis (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Introduction to traditional and contemporary approaches in the study of literature and the fundamental skills required for the analysis of literary texts.</td>
<td></td>
</tr>
<tr>
<td>211</td>
<td>Introduction to Writing Studies (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>A broad history of writing and rhetoric as well as an introduction to spheres of writing studies: creative, academic, professional/technical, and public writing. Prereq: ENGL 120.</td>
<td></td>
</tr>
<tr>
<td>212</td>
<td>Literature and the Environment (CCN)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Milestones of American writing about nature and culture from Thoreau to the present. Reading and analysis of literary encounters with place and issues that arise when the local is global. Prereq: ENGL 120.</td>
<td></td>
</tr>
<tr>
<td>213</td>
<td>19th Century American Fiction</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Selected fiction reflecting problems and ideas, emphasizing the shift from romanticism to realism and naturalism, of the 19th century. Representative writers: Cooper, Hawthorne, Twain, Jewett, James, and Wharton, and includes minority voices.</td>
<td></td>
</tr>
<tr>
<td>214</td>
<td>20th Century American Fiction</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Selected fiction reflecting social, psychological, and literary trends in the 20th century. Includes multicultural and women authors, as well as experimentation in genre.</td>
<td></td>
</tr>
<tr>
<td>215</td>
<td>Themes in American Culture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>A multidisciplinary approach, including art, music, and literature, to various eras and themes in American cultural history.</td>
<td></td>
</tr>
<tr>
<td>216</td>
<td>Visual Culture and Language</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>This course will cover the rise of visual culture and the impact this historical shift has made on print culture and writing. Students will produce information graphics, photo essays, videos, and other genres. Prereq: ENGL 120, Junior standing.</td>
<td></td>
</tr>
<tr>
<td>217</td>
<td>Writing in the Humanities and Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Theory and practice for writing multiple genres in the humanities and social sciences. Prereq: ENGL 120, Junior standing.</td>
<td></td>
</tr>
<tr>
<td>218</td>
<td>Grammatical Structure</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Examines the system of the English sentence. Emphasis on structures and components with attention to application in teaching, stylistic analysis, and editing.</td>
<td></td>
</tr>
<tr>
<td>219</td>
<td>Modern Poetry</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Experimentation and innovation in poetry from 1910 to 1945. American, English, and Irish poets, including such transnational writers as Eliot, Pound, H.D., D.H. Lawrence, and Auden. Prereq: ENGL 120.</td>
<td></td>
</tr>
<tr>
<td>220</td>
<td>Shakespeare</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Study of representative poetry, comedy, histories, and tragedies.</td>
<td></td>
</tr>
<tr>
<td>221</td>
<td>American Road Book</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>A study of the American road narrative in cultural and historical contexts, including the rise of the automobile and tourism, the American dream, the frontier myth, race, class, and gender, and national and individual identity.</td>
<td></td>
</tr>
<tr>
<td>222</td>
<td>Film Genres and Styles</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Study of one or more film genres, styles, or movements, focusing on aesthetic conventions, cultural context, socio-historical significance, and critical approaches. May be repeated with change of topic. Prereq: THEA 115 or ENGL 225 or 271.</td>
<td></td>
</tr>
<tr>
<td>223</td>
<td>British Fiction</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Examines significant works of British short and long fiction in terms of their cultural, social, and psychological content and their literary artistry.</td>
<td></td>
</tr>
<tr>
<td>224</td>
<td>Non-Fiction Prose</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Examines non-fiction prose in its various forms as a significant literary genre capable of exploring cultural, social, historical, psychological, and philosophical matters with logic, emotional power, and literary artistry.</td>
<td></td>
</tr>
<tr>
<td>225</td>
<td>Literary Publications I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Theory and practice in the process of producing a literary magazine. Prereq: ENGL 120.</td>
<td></td>
</tr>
<tr>
<td>226</td>
<td>Creative Writing Studio</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Advanced creative writing with an emphasis on the student as working writer. Readings in creative and/or critical texts and participation in community events. Intensive workshop discussion, with the goal of publishing a manuscript. Prereq: ENGL 275, 322, or 323.</td>
<td></td>
</tr>
<tr>
<td>227</td>
<td>Contemporary Linguistics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Language characteristics (sound, structure, meaning, conversation), relation to culture, first and second language acquisition.</td>
<td></td>
</tr>
<tr>
<td>228</td>
<td>Advanced English Grammar</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Systematic examination of the structures and processes that shape English sentences; development of skills to analyze why certain structures are more or less appropriate. Prereq: ENGL 450.</td>
<td></td>
</tr>
</tbody>
</table>
452/652 History of the English Language
Development of the English language from its Germanic origins to the modern period.

453/653 Social and Regional Varieties of English
Study of sociological factors as they relate to language (American English). Examines region, age, gender, ethnicity, self-identity, situation, profession, etc. and their relation to pronunciation, word choice, politeness, formality,turn-taking, etc. Students conduct original research.

454/654 Language Bias
Application of current linguistic, rhetorical, and literary theory to examine and analyze the ways in which the social asymmetries of gender, sexuality, race, and ethnicity are reflected and sustained through discourse practices.

456/656 Literacy, Culture, and Identity
Reading, writing, research, and discussion of diverse types of literacy from functional to cultural to technological and their roles in culture and identity formation. Completion of related community projects. Prereq: ENGL 120, Junior standing.

457 Electronic Communication
This web-based class will explore issues related to electronic communication through selected projects, projects that allow students to develop skills and insight through experiential learning, and thorough reflection on the dynamics of online education itself. Prereq: ENGL 120.

458 Advanced Writing Workshop
Writing, revising, and editing projects based on rhetorical principles. Frequent response from peers and instructor. Analysis of selected readings and students’ own writing. Prereq: ENGL 358.

459/659 Researching and Writing Grants and Proposals
A rhetorical approach to researching and writing academic grants, business proposals, and related professional documents. Students develop a portfolio of professionally designed and edited documents as well as the vocabulary of grants writing and research. Prereq: ENGL 120, Junior standing.

467 English Studies Capstone Experience
Cumulative and integrative study for English majors of English major, language, literature, and composition. Prereq: ENGL 271.

471/671 American Realistic Literature
Principles of American literary realism as exhibited in the major works of Howells, James, Twain, Crane, Chopin, Gilman, Norris, Wharton, Dreiser, and others. Combination varies.

472/672 20th Century American Writers
Intensive study of major American writers from 1900 to 1950.

474/674 Native American Literature
The development of literature by and about Native Americans is traced from 1850 to the present. Focus on Native American identity and contributions to the American culture.

476/676 Topics in American Literature
Intensive study of a special theme, form, period, or group of writers central to the formation and development of American literature. May be repeated with change of topic.

480/680 Medieval Literature
British poetry and prose from the beginning of the Middle Ages to 1500, excluding Chaucer.

482/682 Renaissance Literature
Study of British writers of the 16th and 17th centuries.

483/683 Topics in British Literature
Intensive study of a special theme, form, period, or group of writers central to the formation of British literature. May be repeated with change of topic.

485/685 18th Century Literature
Study of major writers: Dryden, Pope, Swift, and Johnson, with occasional excursions into the fictional territory of Richardson, Fielding, Sterne, and Smollett.

486/686 Romantic Literature
Study of major British writers from the French Revolution to the coronation of Queen Victoria.

724 Writing: Invention to Innovation
Exploration of the use of rhetorical canon in writing, spanning a period from the Aristotelian concept of invention to the contemporary manifestation of innovation. Prereq: admission to English graduate program.

753 Rhetorics and Poetics of New Media
This web-based class will provide in-depth study of major new media theorists and require students to consider the research and teaching implications of new media for the humanities and social sciences.

754 Rhetorics of Science and Technology
The study and critique of the rhetorics of science and technology, informed by rhetorical theory and by the philosophy of and the social studies of science and technology.

755 Composition Theory
Study of contemporary theories of teaching writing with frequent summary/response papers on assigned readings and a research paper on composition theory.

756 Composition Research
Study of designs and basic statistics for writing research; analysis of current research; and a research project in composition.

757 Composition Studies
Overview of major areas in composition studies (rhetoric and composition, theory and practice, research, and instructional trends).

759 History of Writing Instruction
The study of the history of writing instruction from antiquity to the present, with emphasis on relevance to modern writing instruction.

760 Graduate Scholarship
Introduction to scholarship in English studies and to the nature and state of the discipline.

762 Critical Theory
Study of contemporary literary theory and criticism.

764 Classroom Strategies for TAs
Introduction to current issues in composition pedagogy, research, and theory, focusing on how they inform teaching practices. Instruction on developing philosophy and strategies for teaching through short position papers, literacy autobiography, and a sequence of assignments for ENGL 120.

770 Studies in American Literature
Intensive study of a special period, theme, technique, or group of writers central to the formation, development, or flowering of American literature. May be repeated for credit with change of topic.

780 Studies in British Literature
Intensive study of a special period, theme, technique, or group of writers central to the formation, development, or flowering of British literature. May be repeated for credit with change of topic.

ENTOMOLOGY (ENT)

Boetel, Foster, Harris, Knodel, Prischmann, Rider

COURSES

210 Insects, Humans, and the Environment
Insect biology and its relevance to humans and the environment. 2 lectures. S (ND:SCI)

350 General Entomology
Fundamental aspects of insect structure, classification, and biology with sections emphasizing horticultural entomology, agronomic crop protection, insect ecology, and aquatic entomology. 3 lectures, 1 three-hour laboratory. F

360 Economic Entomology
A distance education course covering agronomic and horticultural insect pests including impact of insects, introduction to IPM, pest management tools, and insect vectors of diseases. May be repeated for 1 credit if previously taken for 2 credits. Prereq: BIOL 151. F

410/610 Management of Pests
How pests are managed and influenced by the environment, society, economics, and pest biology. This class will look at these factors and how they affect pest management practice across taxonomic groups. Prereq: BIOL 151, ENT 350, PPTH 324, PSLC 323. S (even years)

731 Principles of Integrated Pest Management
Principles embodied in the implementation of multifaceted tactics designed to successfully manage pest populations. Prereq: ENT 350, STAT 330. S (even years)

732 Plant Resistance to Insects
Plant/insect interactions and their applications to plant breeding to increase resistance to pests. Prereq: ENT 350. F (even years)

742 Quantitative Biology
Philosophy and techniques for collecting, handling, and interpreting research data in the biological sciences. Prereq: STAT 330. Cross-listed with BIOL.
ENVIRONMENTAL DESIGN (ENVD)

**COURSES**

**101 Introduction to Environmental Design**
Introduction to the environmental design fields of city planning, urban design, landscape architecture, architecture, and interior design. Particular attention is given to basic design concepts, visualization, visual analysis, imagination, and creativity.

**130 Drawing for Environmental Designers**
Introduction to traditional frehand methods of graphic exploration as employed in architecture and landscape architecture. Prereq: ENVD 101.

**172 Environmental Design Fundamentals**
Introduction to design studio, with practice in representational media, techniques and skills exploring drawing, visual abstraction, literal relating to environmental design problem-solving, visual resolution of form and proportion, and graphic communication. Prereq: ENVD 101.

**FOOD SAFETY (SAFE)**

**COURSES**

**401/601 Food Safety Information and Flow of Food**
An orientation to food safety. How to find, evaluate and report credible food safety information, and comprehension of the complexity of food systems. F, S, SS

**402/602 Foodborne Hazards**
This course will lead students into the comprehension of the vast variety of chemical, physical and biological foodborne hazards. Recommended Prereq: SAFE 401 or 601. F, S, SS

**403/603 Food Safety Risk Assessment**
This course will enforce the concept that no food is 100% safe, and will lead students to understand how to assess the likelihood of foodborne illness events. Recommended Prereq: SAFE 402 or 602. F, S, SS

**404/604 Epidemiology of Foodborne Illness**
This course will lead students to understand foodborne disease outbreaks, comprehend and apply epidemiologic models of disease causation and causal inference, and apply disease outbreak investigation steps. Recommended Prereq: SAFE 403 or 603. F, S, SS

**405/605 Costs of Food Safety**
This course will lead students to comprehend and analyze the economic and societal costs of foodborne illness outbreaks. Recommended Prereq: SAFE 404 or 604. F, S, SS

**406/606 Food Safety Crisis Communication**
This course will lead students to understand the best ways to disseminate food safety information during or following a foodborne illness outbreak. Recommended Prereq: SAFE 405 or 605. F, S, SS

**407/607 Food Safety Risk Management**
This course will lead students to understand strategies and costs of reducing risk of foodborne illness. Recommended Prereq: SAFE 406 or 606. F, S, SS

**408/608 Food Safety Regulatory Issues**
This course will lead students to understand the food safety regulatory structure. Recommended Prereq: SAFE 407 or 607. F, S, SS

**409/609 Food Safety Risk Communication and Education**
This course will lead students to understand the importance of worker training and consumer education in food safety. Recommended Prereq: SAFE 408 or 608. F, S, SS

**452/652 Food Laws and Regulations**
Regulations, laws, and dynamics governing development of food policy. Prereq: SAFE 470. Cross-listed with CFS and AGEC. S

**474/674 Epidemiology**

**484/684 Food Safety Practicum**
Supervised experience to give students hands-on practice at addressing food safety problems. Placement with industry, government or academic settings will be arranged. Program permission required for registration.

**485 Crisis Communication**
See Communication for description.

**720 Food Safety Costs and Benefits Analysis**
Theoretical and empirical impacts of food safety costs and benefits. Prereq: SAFE 470/670, AGEC 741. Cross-listed with AGEC.

**725 Food Policy**
Provides quantitative tools and models used to analyze general food safety policies. Prereq: SAFE 470/670. Cross-listed with AGEC and CFS.

**750 Advanced Topics in Epidemiology**
Distribution and dynamics of disease in populations, and factors contributing to the costs of foodborne illness and its prevention. Three lectures. Prereq: SAFE 474/674. Recommended: MICR 460. F (even years) Cross-listed with MICR.

**752 Advanced Food Microbiology**
State-of-the-art techniques in isolation, detection, and characterization of food-borne pathogens. Prereq: MICR 653. Cross-listed with CFS and MICR.

**753 Food Toxicology**
Discussions on the properties of toxic substances found both naturally and as contaminants in foods, the hazards they present to humans and their food supplies, and ways to reduce risks. Prereq: BIO 460. S (even years)

**762 Advanced Pathogenic Bacteriology**
See Microbiology for description.

**785 Advanced Crisis Communication**
Long- and short-term issues for managing communication related to organizational crises are discussed in the stages of pre-crisis, crisis and post-crisis. Cross-listed with COMM.

**786 Risk Communication**
Explores the relationship between communication strategies and risk perception, assessment, and management. Cross-listed with COMM.
FRENCH (FREN)
Homan, Chair; Hageman, Saar

COURSES

101, 102 First-Year French I, II (CCN) 4 each
Basic structures and vocabulary of French. Practice in the fundamentals of listening, speaking, reading, and writing. No previous knowledge of French required for FREN 101. Prereq for FREN 102: FREN 101 (ND:HUM)

201, 202 Second-Year French I, II (CCN) 3 each

311, 312 French Conversation and Composition I, II 3 each
Advanced practice to develop greater proficiency in oral and written skills through the study of cultural and literary readings. Prereq: FREN 202.

315 Contemporary France 3
An interdisciplinary study of present-day France; discussion of the political, social, and cultural context, including a brief historical overview and the role of France within the global community. Taught in French. Prereq: FREN 312.

340 The French-Speaking World 3
Study of works by Francophone writers and the history and cultures that influence their writings. Taught in English and French.

345 [380] Women in French Literature 3
Study of works by French and Francophone women writers of different literary periods; portrayals of women by French male and female authors. Taught in English and French.

350 Introduction to French Linguistics and Pronunciation 3
Study of the basic nature and function of languages as applied to French. Application of principles of phonetics to the pronunciation of the French language, plus extended practice in diction and intonation. Prereq: FREN 312.

360 Studies in Language and Style 3
Focus on the theory and practice of writing in multiple genres in French. Taught in French. Prereq: FREN 312, ENGL 120, Junior standing.

365 Advanced Conversation Through Contemporary Culture 3
Advanced practice oral skills in the context of contemporary current events in France and the Francophone world; may be repeated for credit. Taught in French. Prereq: FREN 312.

370 Translation: Practice and Theory 3
Introduction to basic concepts, strategies, and issues in translation; practice and development of skills and techniques for translation of a wide variety of texts. Taught in French and English. Prereq: FREN 312.

381 Masterpieces of French Literature in Translation 3
Designed for those with no background in French. Introduction to important writers of several periods. Taught in English. Does not count toward a French major or minor.

401 Approaches to Literature 3
Introduction to a variety of critical approaches to literature; how to read, understand, and write about French and Francophone texts from various genres and periods. Taught in French. Prereq: FREN 312.

410 French Literature and Culture before 1800 3
Overview of the cultural and political history of France before the Revolution and an introduction to important writers and artists through representative works. Taught in French. Prereq: FREN 312.

412 French Literature and Culture since 1800 3
Overview of the cultural and political history of France since the Revolution and an introduction to important authors and artists through representative works. Taught in French. Prereq: FREN 312. (alternate years)

420 Themes and Topics in French Literature and Culture 3
Exploration of a significant theme or topic in French or Francophone literature and culture (e.g. the comic; philosophy and literature) not routinely included in the curriculum. May be repeated for credit with change in topic or theme. Taught in French. Prereq: FREN 312.

422 Genres in French Literature 3
In-depth study of works in French on a specific genre. Course may be repeated for credit with change in genre. Taught in French. Prereq: FREN 312.

489 Senior Thesis 1-6
Capstone experience option. Research and original investigation under the guidance of a faculty member. Student work to be written in French.

GEOGRAPHY (GEOG)
Saini-Eidukat, Chair; Oduor

COURSES

151 Human Geography (CCN) 3
Non-ethnocentric understanding of geography of human lifestyles and activities; their place and role in human-environment interaction. (ND:SS)

161 World Regional Geography (CCN) 3
Study of geographic processes shaping major world regions and inter-relationships in the global village; geographic bases and implications of current world events. (ND:SS)

262 Geography of North America (CCN) 3
Spatial approach to the development of the United States and Canada, which stresses changing cultural landscapes and assessing impacts of planning for resource utilization.

412/612 Geomorphology 3
See Geology for description.

455/655 Introduction to Geographic Information Systems 3
Application of the principles of geographic information systems and integrally related mapping to solve problems related to environment site characterizations, resource exploration, soil and groundwater contamination, geological and geotechnical investigations, waste management, construction, etc. Comprehensive lab assignments included to give students hands-on experience solving problems with current state-of-the-art software and hardware, digitizers, scanners, and GPS units.

456/656 Advanced Geographic Information Systems 3
Application and analysis of advanced techniques and principles of geographic information systems and remote sensing technologies to fully address spatial and time related problems related to urban site characterizations, hydrologic analyses, risk assessment, policy making, disaster response and strategic defense techniques. Comprehensive lab assignments included to give students hands-on experience solving problems with current state-of-the-art software and hardware, digitizers, scanners, and GPS units. Prereq: GEOG 455/655.

GEOLOGY (GEOL)
Saini-Eidukat, Chair; Ashworth, Hatzenbihler, Lepper, Lewis, Oduor, Schwert

COURSES

101, 105L Physical Geology, Lab (CCN) 3,1
Study of the Earth as a physical body; its structure, composition, and the geologic processes acting on and within the Earth. (ND:LABSC)

106, 106L The Earth Through Time, Lab (CCN) 3,1
Introduction to the Earth through time; its origin, history, and evolution of animal and plant life. (ND:LABSC)

210 Dinosaurs: Rulers of the Mesozoic 2
A survey of the dinosaurs: their fossil record, environment and place in Earth history.

300 Environmental Geology 3
Human interaction with Earth’s environment. Earthquakes, floods, volcanoes, landslides, water use, pollution, energy, mining, and land-use planning. Prereq: GEOG 105, 105L. (alternate years)

301 Lake Superior Field Course 2

302 Black Hills Field Course 2

303 Paleontology Field Course 1
Paleozoic stratigraphy and paleontology of southeastern Minnesota and northern Iowa. Lecture by arrangement, 1 three and one-half day field excursion. Fee required. Prereq: GEOG 105, 105L, 106, 106L.

304 Eastern North Dakota Field Course 1
Field study of Mesozoic and Cenozoic sediments of eastern North Dakota. Two-day field excursion and a report. Fee required. Prereq: GEOG 105 or 106.

310 Planetary Geology 3
Survey of planetary geology reinforcing concepts of physical geology; formation and composition of the solar system, comparative planetary geology and geomorphology, extra-solar systems and habitable worlds, astrobiology. Prereq: GEOG 105.

350 Invertebrate Paleontology 3
Survey of invertebrate fossils emphasizing systematics, environments and as stratigraphic markers. Offered periodically. Prereq: GEOG 106, 106L.
### Hydrogeology (414/614)
Prereq: GEOL 105, 105L. (alternate years)
- Landforms and the processes by which they are formed and modified. Prereq: GEOL 105, 105L. (alternate years)
- Cross-listed with GEOG.

### Glacial Geology (413/613)
Prereq: GEOL 105, 105L. (alternate years)
- Glacial landscapes as records of global climate and environmental change; glacial history of North America.

### Geomorphology (412/612)
Prereq: GEOL 105, 105L, 106, 106L. (alternate years)
- Origin and classification of sedimentary rocks and their stratigraphic relationships. 3 lectures, 1 laboratory.

### Biogeochemistry (460/660)

### Advanced Biogeochemistry (760)
Examines the nature of the interaction between Earth’s biogeochemical cycles and climate and how this interaction has evolved over time and will change in the future. Offered periodically. Prereq: GEOL 460/660.

### German (GERM)
**Grollman**

**COURSES**
- 101, 102 First-Year German I, II (CCN) 4 each
  - Basic structures and vocabulary of German. Practice in the fundamentals of listening, speaking, reading, and writing.
  - No previous knowledge of German required for GERM 101. Prereq: For GERM 102: GERM 101 (ND:HUM)
- 201, 202 Second-Year German I, II (CCN) 3 each
  - Emphasis on developing proficiency in the four language skills. Review of grammar, practice in composition, and cultural and literary reading.
  - Prereq: For GERM 201: GERM 102, 202: GERM 201. (GERM 201: ND:HUM)
- 220 German Culture and Society 3
  - Exploration of German culture (including everyday culture, film, and literature), politics, history, geography, and religion. A broad overview with particular emphasis on Germany since 1945. Taught in English.
- 311, 312 German Conversation and Composition I, II 3 each
  - Advanced practice to develop greater proficiency in oral and written skills through the study of cultural and literary readings.
  - Prereq: For GERM 311: GERM 202.

### Health, Nutrition and Exercise Science (HNES)
**Albrecht, Ary, Barnhart, Brunt, Christensen, Deutsch, Evans, Fountain, Gange, Garden-Robinson, Gold, Hansen, Hetland, Liguori, Rhee, Stasny, Strand, Terbizan, Winters**

**COURSES**
- 100 [HPER] Concepts of Fitness and Wellness (CCN) 2
  - Facts about exercise and physical fitness.
- 108 Tae Kwon Do I 1
  - The purpose of this course is to teach basic technique and practice of Tae Kwon Do.
- 109 Beginning Aikido 1
  - The purpose of this course is to teach basic technique and practice of beginning Aikido.
- 110 Introduction to Health, Nutrition and Exercise Sciences 1
  - Introduction to career opportunities and requirements within the profession. Investigation of the various majors in health, physical education, athletic training, human performance and fitness, nutrition, recreation and sport management.
  - Coreq: HNES 150, 160, 170, or 190.
- 111 Wellness 3
  - Examination of personal lifestyle choices related to emotional, nutritional, and mental well-being.

### Sedimentology/Stratigraphy (410)
Origin and classification of sedimentary rocks and their stratigraphic relationships. 3 lectures, 1 laboratory. Prereq: GEOL 105, 105L, 106, 106L. (alternate years)

### Geology (415/615)
Prereq: GEOL 105, 105L, MA TH 105. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Hydrogeology (414/614)
Prereq: GEOL 105, 105L. (alternate years)
- Concepts of surface and groundwater hydrogeology in natural systems; the hydrologic cycle; physical properties of aquifers and subsurface flow; open channel flow; aqueous geochemistry. Prereq: GEOL 105, MATH 147 or 166, CHEM 122 or 161. (alternate years)

### Glacial Geology (413/613)
Prereq: GEOL 105, 105L. (alternate years)
- Glaciers as agents of geologic change; evolution of landscapes shaped by glaciers; glaciers and glacial landscapes as records of global climate and environmental change; glacial history of North America. Prereq: GEOL 105, 105L. (alternate years)

### Geomorphology (412/612)
Prereq: GEOL 105, 105L, 106, 106L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Hydrogeology (414/614)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Glacial Geology (413/613)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Geomorphology (412/612)
Prereq: GEOL 105, 105L, 106, 106L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Hydrogeology (414/614)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Glacial Geology (413/613)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Geomorphology (412/612)
Prereq: GEOL 105, 105L, 106, 106L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Hydrogeology (414/614)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Glacial Geology (413/613)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Geomorphology (412/612)
Prereq: GEOL 105, 105L, 106, 106L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Hydrogeology (414/614)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Glacial Geology (413/613)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Geomorphology (412/612)
Prereq: GEOL 105, 105L, 106, 106L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Hydrogeology (414/614)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Glacial Geology (413/613)
Prereq: GEOL 105, 105L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)

### Geomorphology (412/612)
Prereq: GEOL 105, 105L, 106, 106L. (alternate years)
- Principles of igneous and metamorphic petrology including geochemistry, phase relations, and rock forming processes. Prereq: GEOL 420/620. (alternate years)
Course Descriptions

133 Volleyball  
Basic technique and practice of volleyball.

134 Basketball  
Basic technique and practice of basketball.

135 Badminton  
Basic technique and practice of badminton.

136 Hockey  
Basic technique and practice of hockey.

137 Tennis  
Basic technique and practice of tennis.

138 Flag Football  
Basic technique and practice of flag football.

139 Dodgeball  
Basic technique and practice of dodgeball.

140 Strength Training  
Basic technique and practice of strength training.

141 Food Sanitation  
Principles of safe food handling practices designed for food service operators. Includes Food Safety Managers' Certification. Restricted to Dietetics, Hospitality, Family Consumer Science, Food Science, and Food Safety majors and minors only.

142 Yoga II  
The purpose of this course is to teach intermediate technique and practice of Yoga.

150 Foundations of Physical Education  
Introduction to developing a conceptual framework for teaching physical education. Includes an overview of the preparation needed and what is expected of physical education teachers. Coreq: HNES 110.

154 Professional Preparation in Elementary School Activities  
Instruction of various fundamental movements for elementary aged students. Students will be exposed to such activities as dance, gymnastics, fundamental movement skills, and games. Prereq: HNES 110, 150.

160 Foundations of Health Professions  
Introduction to health education and health promotion that examines the professional activities and competencies required for successful practice in the field. Coreq: HNES 110.

170 Introduction to Exercise Science  
Investigation of various Exercise Science career opportunities within the field and the professional track at NDSU. Coreq: HNES 110.

180 Athletic Trainers' Profession  
Overview of athletic training and preparation required. Investigation of various career opportunities within the profession. Coreq: HNES 110.

181 Practical Applications of Taping, Protective Devices, and Equipment  
Practical exposure to evaluation, application and construction of; protective devices, taping techniques and equipment safety modifications for use in the athletic training setting. Prereq: BIOL 220, 220L.

190 Introduction to Sport and Recreation Studies  
This course is designed to introduce sport and recreation studies majors to the foundations and underlying principles of sport and recreation management. Prereq: HNES 110.

200 [NUTR 240] Principles of Nutrition  
Current nutrition facts and philosophy as a basis for meeting nutritional needs in a changing society.

210 [HPER] First Aid and CPR (CCN)  
Successful course completion leads to American Red Cross CPR certification for adult, child, and infant AED certification for the adult and child; and First Aid involving a variety of emergency situations.

211 Successful Coaching  
This course is designed to help potential coaches develop a successful coaching philosophy. Students will complete an examination through the American Sport Education Program that will certify them to coach in 35 states.

217 [HPER] Personal and Community Health (CCN)  
Study of vital personal and community health issues. Particular attention to current health facts, habits, and attitudes as they relate to home, school, and community.

220 Lifeguard Training  
American Red Cross techniques and methods of aquatic safety and lifeguarding. Meets American Red Cross standards.

224 Event Management in Sport  
Introductory course in event management that will provide students the opportunity to investigate the facilitation of sports events. A major component of this course will be participation in a major sports event. Prereq: HNES 190 and Sports and Recreation Studies or Physical Education-Community Sports majors only.

225 Camp Management and Outdoor Recreation Skills  
Principles and practices in camp management and counseling. Camping skills, activities and techniques. Prereq: Sports and Recreation Studies or Physical Education-Community Sports majors only.

226 Introduction to Therapeutic Recreation  
Survey of serving special populations, therapeutic recreation models, processes, rationales, terminology, and professional issues.

231 Officiating Football  
Rules and techniques of officiating football.

232 Officiating Basketball  
Rules and techniques of officiating basketball.

240 Emergency Response  
First aid and CPR certification through the American Red Cross; AED training, transporting the injured/ill athlete for further medical care.

250 Nutrition Science  
Scientific principles of nutrition based on chemical structure and function of the nutrients. Prereq or Coreq: CHEM 117 or 121.

251 Nutrition, Growth, and Development  
Examination of growth and nutrient needs through the lifecycle. Prereq: HNES 200 or HNES 250.

253 Motor Learning and Performance  
Study of the principles of motor learning and development and how those principles apply in physical education and sport skill development. Prereq: HNES major or minor or Coaching minor.

255 Professional Preparation in Middle School Physical Education  
Instruction of various fundamental movement for middle school students. Students will be exposed to such activities as team sports, intermediate movement skills, and games. Prereq: HNES 110, 150, 154, 253, 256 and HPE professional standing.

256 Professional Preparation in High School Physical Education  
Instruction in the fundamentals of teaching high school physical education activities. Prereq: HNES 110, 150, 154, 253 and HPE professional standing.

260 Athletic Training Medical Terminology  
Medical terminology related to athletic training and other allied health professions.

261 Food Selection and Preparation Principles  
Scientific principles underlying food selection, preparation, and preservation; integration of nutrition principles, food standards, cost comparisons, and new food developments. Prereq: HNES 141 and CHEM 117 or 121.

261L Food Selection and Preparation Principles Laboratory  
Illustrates and extends lecture topics and stresses practical application of scientific food preparation principles. Prereq: HNES 141. Coreq: HNES 261.

270 Consumer Issues in Nutrition  
Current issues in food and nutrition recommendations and consumer related concerns.

271 Techniques of Strength and Conditioning  
The course presents strength training and conditioning theory and practice. Explored are principles of strength and conditioning, mastery and analyses of different exercises, and program design and implementation for general/athletic/special populations.

272 Techniques of Cardiovascular Conditioning  
Understanding the techniques of conditioning the cardiovascular system. Types of conditioning explored: walking, jogging, spinning, aerobic dance, step aerobics, bench programming, cardio-kickboxing, TaeBo, and other popular types of programming.

276 Professional Observation  
Observation in a setting providing established health-fitness services. Prereq: HNES 170, 272.

280 Sport Safety Training  
Basic first aid and CPR skills and information needed to care for sports related injuries.

281 Injury Recognition and Evaluation of the Lower Extremity  
Injury recognition, treatment, management and evaluation of the lower extremity. Prereq: BIOL 220, 220L, 221, 221L.

282 Athletic Training Terminology and Equipment  
Medical terminology related to athletic training and proper methodology used in the fitting, maintenance, and operation of athletic training equipment. Prereq: HNES 181.
284 Clinical Experience I
Clinical proficiencies and clinical experience hours. Prereq: Admission into Athletic Training Education program.

285 Clinical Experience II
Clinical proficiencies and clinical experience hours. Prereq: HNES 284.

286 Injury Recognition Laboratory
Introduction to athletic injury assessment. Practical application of topics discussed in HNES 281 lecture. Coreq: HNES 281.

300 Curriculum, Standards, and Assessment in Physical Education
This course bridges the gap between theory and practice by providing a practical approach to curriculum writing, standards development and assessment techniques used in K-12 physical education programs. Prereq: HNES 253, 255, 256 and HPE professional standing.

302 Water Safety Instruction
Methods of teaching swimming and water safety. Meets American Red Cross standards.

326 Recreation Programming
Principles of the process for designing leisure experiences. Art, crafts, music, dance, sport and games, special events, and environmental activities are examined. Risk management, intramural sports organization and program budgeting are stressed. Prereq: HNES 110 and Sports and Recreation Studies or Physical Education-Community Sports majors only.

330 Coaching Football
Rules, theory, principles, and fundamentals of coaching football. Prereq: Knowledge of the sport.

331 Coaching Basketball
Rules, theory, principles, and fundamentals of coaching basketball. Prereq: Knowledge of the sport.

332 Coaching Track and Field
Rules, theory, principles, and fundamentals of coaching track and field. Prereq: Knowledge of the sport.

333 Coaching Wrestling
Rules, theory, principles, and fundamentals of coaching wrestling. Prereq: Knowledge of the sport.

334 Coaching Baseball and Softball
Rules, theory, principles, and fundamentals of coaching baseball and softball. Prereq: Knowledge of the sport.

335 Coaching Volleyball
Rules, theory, principles, and fundamentals of coaching volleyball. Prereq: Knowledge of the sport.

336 Methods of Coaching
Provides information necessary to coach at any level from elementary to college. Includes broad overview of the philosophy, methodology, and management of sport.

341 Psychosocial Aspects of Health
Study of the interaction of the person and his/her environment. Discussion of emotional states, physiological responses and behaviors influencing a person’s health, and the health of those around them. Prereq: PSYC 111.

345 Materials and Concepts of Health Education
Development and dissemination of health content helping community and school health educators place health instruction in a perspective that relates it to efforts aimed at protecting and promoting the health of children, youth and adults. Prereq: HNES 217, HNES 160, health major or minor.

350 Fitness Education Activities and Materials
Topics related to teaching concepts-based fitness in high school physical education. Prereq: HNES 253, 255, 256, 300, 367 and HPE professional standing.

351 Metabolic Basis of Nutrition
Biochemical and physiological principles of human nutrition. Nutrients in relation to metabolic regulation. Prereq: HNES 250, CHEM 240, BIOC 260 or 460 and Dietetics professional standing.

352 Physical Education Activities and Materials
Study of physical education activities and materials that physical education majors and minors will use in EDUC 481. Prereq: HNES 253, 255, 256, 300, 367 and HPE professional standing.

354 Introduction to Medical Nutrition Therapy
Introduction to the role and skills in nutritional care and application of skills necessary for beginning competency as a clinical dietitian. Prereq: HNES 251, 351.

354L Introduction to Medical Nutrition Therapy Laboratory
Supervised practice in dietetics, for Coordinated Program Dietetics students, in a health care setting. 1 three-hour laboratory. Prereq: HNES 251, 351. Coreq: HNES 354.

355 International Health
Introduction to the interrelationship of health and international affairs focusing on health as an issue of international relations and the technical and financial cooperation for health and the development.

361 Food Production Management
Principles and methods of purchasing, production, and management for quantity foodservice operations. Prereq: HNES 261, 261L.

361L Food and Production Mgmt Laboratory
Illustrates and extends lecture topics in a student-led “lab” restaurant operation. Coreq: HNES 361.

365 Kinesiology
Study of movement analysis with emphasis on anatomical and movement principles. Prereq. BIOL 220, 220L, 221, 221L.

367 Principles of Conditioning
Scientific theory and application of principles and techniques of physical conditioning to optimize training programs. Introduction of a wide variety of sports activities and associated training protocols. Prereq: BIOL 220, 220L.

368 Biomechanics of Exercise
Study of the application of the principles of biomechanics and physics to human movement. Prereq. HNES 365.

370 Activity Benefits and Exercise Prescription in Disease
Focus on the role of physical activity in the development and treatment of chronic/metabolic diseases, with description of exercise interventions. Prereq: HNES 271, 272.

371 Fitness Programming and Management
Implementing various types of health and fitness programs focusing on worksite health promotion programming. Prereq: HNES 271, 272.

381 Injury Recognition and Evaluation of the Upper Extremity
Injury recognition, treatment, management and evaluation of the upper extremity. Prereq: HNES 281.

382 Injury Recognition and Evaluation of the Head, Neck and Spine
Injury recognition, treatment, management and evaluation of the head, neck and spine. Prereq: HNES 381.

383 Psychosocial Aspect of the Injured Athlete
Intervention and counseling concepts that prepares the athletic trainer to handle the emotional aspect of the injured athlete. Prereq: HNES 281.

386 Clinical Experience III
Clinical proficiencies and clinical experience hours. Prereq: HNES 285.

387 Clinical Experience IV
Clinical proficiencies and clinical experience hours. Prereq: HNES 386.

420 Needs Assessment and Program Planning in Health Education
This course provides students with the practical knowledge and skills to assess health resources and needs, and to develop and implement health promotion programs to meet specific needs in particular populations.

426 Sport and Recreation Administration
This course is intended to familiarize sport and recreation studies majors with common administrative practices in sport and recreation. Prereq: Junior standing and Sports and Recreation Studies or Physical Education-Community Sports majors only.

427 Leisure and Society
Survey of leisure problems and opportunities in society. Emphasis on critical analysis of completed writing and research in parks and recreation. Historical foundations and development of a personal philosophy of parks and recreation are stressed. Prereq: HNES 110, Junior standing.

428 Sport Management Internship
Course offers students 520 hours of sport industry work experience.

429 Recreation Internship
Capstone course for recreation management majors. Supervised professional internship in an approved park and recreational setting.

430/630 Socio-Cultural Dimensions in Sport
Students will gain a level of understanding of how sport has evolved in society and how it is viewed from different perspectives. Prereq: Junior standing.

431/631 Governance in Sport
The students will gain a level of understanding of (1) how governance in sport is structured, (2) what governance aims to do, and (3) how and why governance impacts sport. Prereq: Sports and Recreation Studies or Physical Education-Community Sports majors only.
### Course Descriptions

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C85/685</td>
<td>Therapeutic Modalities</td>
<td>3</td>
<td>Practical use of various therapeutic modalities used in treating athletic injuries. Emphasis on physiological effects, indications, and contraindications of each form of treatment. Prereq: HNES 382 or 782.</td>
</tr>
<tr>
<td>G87/887</td>
<td>Athletic Training Organization and Administration</td>
<td>3</td>
<td>Organization and administrative components of athletic training including budgeting, facilitation design, human resource topics and professional development items. Prereq: HNES 485/685.</td>
</tr>
<tr>
<td>G88 Clinical Experience V</td>
<td></td>
<td>1</td>
<td>Clinical proficiencies and clinical experience hours. Prereq: HNES 387.</td>
</tr>
<tr>
<td>G89</td>
<td>Athletic Training Capstone Experience</td>
<td>1</td>
<td>Capstone experience providing students the opportunity to utilize athletic training skills and knowledge in an off-site setting under the supervision of a clinical instructor. Prereq: HNES 488.</td>
</tr>
<tr>
<td>701</td>
<td>Administrative Leadership in HNES</td>
<td>3</td>
<td>This course provides an introduction to administrative leadership in health, physical education, recreation and sport. The course is designed to provide students with skills, techniques and practices for successful leadership.</td>
</tr>
<tr>
<td>702</td>
<td>Sport Marketing and Public Relations in HNES</td>
<td>3</td>
<td>Course explores the breadth of the sports marketing industry and how industry interfaces with the consumer. Focuses on research studies and marketing theory related to marketing efficacy.</td>
</tr>
<tr>
<td>703</td>
<td>Scientific Aspects of Sport</td>
<td>3</td>
<td>Essentials of physical training and biomechanical analysis in sport.</td>
</tr>
<tr>
<td>704</td>
<td>Psychological Foundation of Sport and Physical Activity</td>
<td>3</td>
<td>Comprehensive description of sport psychology, application of concepts to sport performance improvements as well as other areas in physical activity.</td>
</tr>
<tr>
<td>710</td>
<td>Recent Literature and Research</td>
<td>3</td>
<td>Directed readings and class discussions of recent literature, steps involved in problem solving, and critical analysis of research in the field.</td>
</tr>
<tr>
<td>711</td>
<td>Physical Education Curriculum</td>
<td>3</td>
<td>To provide an understanding of the role and importance of physical education in today’s society, steps involved in curriculum planning, trends and issues in physical education curriculum and to orient students to various ideas in physical education curriculum design.</td>
</tr>
<tr>
<td>712 Supervision and Analysis in HNES</td>
<td></td>
<td>3</td>
<td>To study the scope of supervision, techniques for improvement of various phases of the learning process of teaching or coaching, and means of evaluating the effectiveness of supervision in the field.</td>
</tr>
<tr>
<td>435/635</td>
<td>Nutrition, Disease, and Health Professional</td>
<td>2</td>
<td>Principles of client assessment and care that reflect recent advances in nutrition management together with their application to practice. Prereq: HNES 250.</td>
</tr>
<tr>
<td>436/636</td>
<td>Issues in Sport Management Economics</td>
<td>3</td>
<td>Students will gain a level of understanding of issues in sport management economics. Prereq: Sports and Recreation Studies or Physical Education-Community Sports majors only.</td>
</tr>
<tr>
<td>441 Health and Safety Services</td>
<td></td>
<td>3</td>
<td>American Heart Association and American Red Cross instructor’s course in responding to emergencies. Prereq: HNES 210 or HNES 200.</td>
</tr>
<tr>
<td>442/642 Community Health and Nutrition Education</td>
<td></td>
<td>3</td>
<td>Nutrition education in community settings. Topics include behavior change, education and counseling theory, needs assessment, planning, implementation, and evaluation in a community setting. Prereq: HNES 251.</td>
</tr>
<tr>
<td>442L/642L Community Health and Nutrition Education Lab</td>
<td></td>
<td>1</td>
<td>Application of nutrition education and program development in community settings. Coreq: HNES 442/642.</td>
</tr>
<tr>
<td>445 Organization and Administration of Coordinated School Health Programs</td>
<td></td>
<td>3</td>
<td>Capstone course for health educators. Examination of coordinated school health programs (CSHP). Analysis of the components of and approaches to development of CSHP. Emphasis on skills required for entry-level health educators. Prereq: HNES 345, Senior standing.</td>
</tr>
<tr>
<td>452/652 Nutrition, Health, and Aging</td>
<td></td>
<td>3</td>
<td>Physiological changes with aging and their relationship to food habits and nutritional need. Common nutritional health problems with emphasis on prevention and treatment. Prereq: HNES 200 or HNES 250.</td>
</tr>
<tr>
<td>453 Food and Dairy Microbiology</td>
<td></td>
<td>3</td>
<td>See Microbiology for description.</td>
</tr>
<tr>
<td>455/655 Sports Nutrition</td>
<td></td>
<td>3</td>
<td>Provides both current research and the translation of research findings into practical advice, offering unique insights on how nutrition can be used to design and effectively implement the optimal diet for performance. Prereq: HNES 200 or equivalent and sophomore standing.</td>
</tr>
<tr>
<td>458/658 Advanced Medical Nutrition Therapy</td>
<td></td>
<td>4</td>
<td>Principles in the nutrition care of patients with conditions requiring nutrition care. Prereq: HNES 354.</td>
</tr>
<tr>
<td>458L Advanced Medical Nutrition Therapy Laboratory</td>
<td></td>
<td>3</td>
<td>Supervised practice for CP students in nutrition care to accompany HNES 458. Coreq: HNES 458/658.</td>
</tr>
<tr>
<td>460 Foodservice Systems</td>
<td></td>
<td>3</td>
<td>Role of foodservice in today's society. Application of administration concepts in foodservice operation including equipment, layout, marketing, and budget management. Prereq: HNES 361, 361L.</td>
</tr>
<tr>
<td>460L Foodservice Systems Laboratory</td>
<td></td>
<td>3</td>
<td>Supervised practice for CP students in foodservice to accompany HNES 460. Coreq: HNES 460.</td>
</tr>
<tr>
<td>461 Administrative and Social Aspects of Physical Education and Athletics</td>
<td></td>
<td>3</td>
<td>Study of administrative principles and social aspects that influence the development of physical education and athletic programs. Prereq: HNES 300, 350, 352, 367, Senior standing and HPE professional standing.</td>
</tr>
<tr>
<td>465 Physiology of Exercise</td>
<td></td>
<td>3</td>
<td>Effects of exercise on the physiology of the human body. Includes aerobic systems, strength/muscle adaptations, body composition, training programs, and other areas related to training. Prereq: HNES 365.</td>
</tr>
<tr>
<td>466 Physiology Exercise Laboratory</td>
<td></td>
<td>1</td>
<td>Laboratory exercises to test aerobic and anerobic capacity, strength, body composition, dietary analysis. Coreq: HNES 465.</td>
</tr>
<tr>
<td>467 EKG Monitoring</td>
<td></td>
<td>2</td>
<td>EKG monitoring and interpretation. Prereq: HNES 466.</td>
</tr>
<tr>
<td>472 Aerobic Fitness Assessment and Techniques</td>
<td></td>
<td>3</td>
<td>Physiological testing procedures applicable to physical activity and fitness settings, with application to aerobic fitness and body composition assessment. Prereq: HNES 466, Coreq: HNES 467.</td>
</tr>
<tr>
<td>473 Anaerobic Exercise Prescription and Advanced Resistance Training Techniques</td>
<td></td>
<td>3</td>
<td>Designing resistance training programs for various sports and activities, with hands on experience leading people through advanced resistance training exercises. Prereq: HNES 271, 365.</td>
</tr>
<tr>
<td>475 Exercise Science Internship</td>
<td></td>
<td>12</td>
<td>Capstone course for human performance and fitness majors. Supervised field work in a professional setting with emphasis on administration, supervision, and program leadership.</td>
</tr>
<tr>
<td>480 Dietetics Practicum (Capstone Experience)</td>
<td></td>
<td>12</td>
<td>Practical experience for students in the Coordinated Program in Dietetics with the responsibility equal to that of an entry-level dietitian. 40 hours laboratory per week in a clinical facility. Prereq: HNES 458L, 460L.</td>
</tr>
<tr>
<td>481 Didactic Capstone Course</td>
<td></td>
<td>2</td>
<td>Capstone for Dietetics majors in the Didactic program in Dietetics.</td>
</tr>
<tr>
<td>482 Community Health Internship</td>
<td></td>
<td>12</td>
<td>Capstone course for Health Education Majors - Community Health Option. Supervised field work in an approved professional setting with an emphasis on administration, supervision and program implementation leadership. Prereq: Senior standing.</td>
</tr>
<tr>
<td>483 Community Sports Internship</td>
<td></td>
<td>9</td>
<td>Capstone course for Physical Education majors - Community Sports option. Supervised field work in an approved professional setting. Prereq: Senior standing.</td>
</tr>
<tr>
<td>484/684 Therapeutic Exercise</td>
<td></td>
<td>3</td>
<td>Planning and implementing a comprehensive rehabilitation program of athletes with injuries/illnesses. Prereq: HNES 381 or 782.</td>
</tr>
</tbody>
</table>
### 713 Graduate Exercise Physiology
3
Comprehensive state-of-the-art review of the current knowledge of the physiological responses to exercise.

### 714 Legal Liability in HNES
3
Focused on risk management and legal liability in health, physical education, and recreation. Overview of civil and criminal law related to sports and recreation.

### 717 Recreation and Sport Complex Management
3
The goal of this class is to explore guidelines and develop a base of information important for the design and management of facilities for physical activity and sport.

### 719 Wellness and Leisure in Adults
3
Explores the role of leisure in adult development with specific focus on the aging process, leisure needs, and leisure services. Basic concepts associated with leisure, aging, targeting leisure services, research and public policy are presented.

### 721 Health Promotion Programming
3
This course is designed to help students understand and develop skills for health promotion programming, regardless of settings.

### 723 Advanced Techniques in Sports Medicine
3
This course will review current research in the latest and most advanced techniques in sports medicine.

### 724 Nutrition Education
3
Principles and practices of teaching individuals and groups to translate nutrition knowledge into action. Emphasis on research in evaluation of nutrition education. Prereq: HNES 200 or HNES 250.

### 726 Nutrition in Wellness
3
Course will address wellness promotion through nutrition. Nutritional risk and protective factors will be examined as they relate to public health and individual nutrition.

### 727 Physical Activity in Wellness
3
Information and discussion regarding the influence of physical activity on personal wellness. Review of the association between sedentary habits, risk for chronic disease, and the most recent physical activity recommendation to battle disease.

### 729 Grant Writing for the Health Professional
3
Steps needed for successful grant applications. Identification of funding sources and completion of the application form. Designed for Registered Dietitians.

### 730 Fundamentals of Leadership
3
An appreciation of the basic principles of leadership by gaining an insight into one's own leadership abilities and developing the practical skills necessary to function as a leader in a realistic context.

### 732 Foodservice Operation Management
3
In-depth analysis of several critical foodservice operations management decisions and development of analytical skills needed in solving operation management problems encountered in the foodservice industry.

### 740 Maternal and Child Nutrition
3
Behavioral, physiological and public health issues impacting dietary and nutritional factors that support normal growth and development. Focuses on the early stages of the life cycle: gestation, lactation, infancy, preschool, school age and adolescence.

### 741 International Nutrition
3
Presents major nutritional problems that influence the health, survival, and developmental capacity of populations in developing societies. Covers approaches implemented at the household, community, national, and international levels to improve nutritional status.

### 750 Advanced Human Nutrition
3
Physiological and biochemical aspects of human nutrition. Prereq: HNES 351, BIOL 701.

### 751 Metabolism of Micronutrients
3
This course focuses on nutrition that integrates mechanisms and interactions of vitamins and minerals from the cellular level, through the integration and regulation of metabolism in the whole organism.

### 752 Phytochemicals
3
Overview of phytochemicals (non-nutritive biologically active compounds) from fruits, vegetables, cereals and oilseeds with implications related to chemistry, physiological functions, and potential health implications.

### 754 Assessment in Nutrition and Exercise Science
3
Techniques to assess nutritional status, physical fitness status and how to interpret the information received.

### 755 Advanced Clinical Nutrition
3
In-depth study of the pathophysiology of nutritional disease. The emphasis is in endocrinology, metabolism, and gastroenterology. Includes pathological disorders that result in nutritional disease or those nutrition diseases which affect physiological function.

### 756 Pediatric Clinical Nutrition
3
The physiological, biochemical and nutritional aspects of disease processes relevant to infants and children up to 18 years of age, including inborn errors of metabolism, food hypersensitivity, obesity, and diseases of the major organ systems. Prereq: HNES 755.

### 777 Current Research Practices In Athletic Training
3
Introduces students to current research methods and the importance of conducting athletic training research.

### 781 Orthopedic Assessment I
5
Practical exposure to evaluation, application, and construction of protective taping devices and techniques. In addition, practice and guidance of injury recognition and evaluation techniques of the lower extremity.

### 782 Orthopedic Assessment II
5
Guidance and practice in the evaluation and recognition of athletic injuries to the upper extremity, head, neck, and back, and skin disorders. In addition, environmental conditions will be discussed.

### 785 Athletic Training Clinical Experience
1-10
Clinical proficiencies and clinical experience hours in the athletic training profession.

### HISTORY (HIST)

<table>
<thead>
<tr>
<th>COURSE</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>101 Western Civilization I (CCN)</td>
<td>Introductory survey of Western Civilization from prehistory to 1648, emphasizing major political, social, cultural, and intellectual developments. (ND:HIST)</td>
</tr>
</tbody>
</table>

### American Indian History (CCN)
3
Survey of Native American history, emphasizing diversity of historical experience. Themes include cultural persistence, leadership and activism, and strategies adopted by Indian communities for coping with change. (ND:HIST)

### American Religious History
3
See Religious Studies for description.
271 Introduction to Latin American History 3
Study of important social, economic, and cultural developments in Latin American history. Emphasizes the socio-economic and cultural topical developments and the political and international factors influencing the region. (ND; HIST)

320 History of Christianity 3
See Religious Studies for description.

333 U.S. Environmental History 3
History of the interrelationships of humans and the natural world in America. Emphasis on the emergence of the conservation and environmental movements from 1830’s to the present.

381 Australia and New Zealand 3
Comprehensive, but not exhaustive, historical comparison of Australia and New Zealand with emphasis on formation of national identity(ies). Organized topically to facilitate comparisons.

382 Canada 3
Topical treatment of the history of Canada, beginning with First Nations and charting the evolution of a bi-cultural, multi-cultural nation-state.

390 Historical Research and Writing 3
Techniques and skills of historical research and writing. Includes researching in libraries and archives, constructing thesis statements, outlining papers, building logical arguments, writing clear and concise English, using primary sources, footnoting, and copyediting. Prereq: ENGL 120, Junior standing.

401/601 Archival Theory and Practice 3
Archival theory and its practical application in supervised projects utilizing the resources of the Institute for Regional Studies and University Archives.

403/603 Archival Photography 3

404/604 Historical Editing 3
This course enables students to experience historical editing. They will: research historical topics; edit manuscripts focusing on thesis statements, grammar, and footnoting; and annotate primary sources to make them accessible to the general reader.

410/610 U.S. Intellectual History I 3
American intellectual trends in areas such as religion, education, race, science, feminism; social and political thought; 1600-1860. Recommended prereq: HIST 103, 104.

411/611 U.S. Intellectual History II 3
American intellectual trends in areas such as religion, education, race, science, feminism; social and political thought; 1860-present. Recommended prereq: HIST 103, 104.

422/622 U.S. History 1829-1917 I 3
Political, social, and economic history of the United States 1829-1877; emphasizing socio-economic change, the Sectional Crisis, the Civil War, and Reconstruction.

423/623 U.S. History 1829-1917 II 3
Political, social, and economic history of the United States 1877-1917; emphasizing industrialization, urbanization, and progressive reform.

424/624 U.S. History 1917-Present I 3
Political, social, and economic history of the United States 1917-1960; emphasizing the New Deal, the world wars, and the Cold War era.

425/625 U.S. History 1917-Present II 3
Political, social, diplomatic, and economic history of the United States since 1960; emphasizing foreign policy, domestic developments, and socioeconomic change.

429/629 History of the American South to 1850 3
Key historical developments in early American history in the South. Major topics include the establishment of white dominance in the southern colonies, the move to a slave culture, and the development of a regional identity.

431/631 The North American Plains 3
Historical treatment of the Great Plains of North America as an international region, comprising the Canadian prairies and the American plains.

434/634 History of Environmental Science 3
Designed to acquaint students with thinkers and events influencing the history of environmental science, politics, and policy in the United States since the late 19th century.

436/636 American Frontier to 1850 3
Early American frontier from 1500s to mid-1800s, emphasizing Indian-White relations, colonial wars, social life in the backcountry, and exploration and settlement.

437/637 American West Since 1850 3
Centers on a century of enormous change in the trans-Mississippi west. Major topics include the Plains Indian wars, post-conquest Indian history, mining, cattle, homesteading frontiers, the urban West, and environmental history.

439/639 History of American Agriculture 3
American agriculture from its Native American and European roots to the present.

440/640 European Intellectual History I 3
Important changes in ideas about science, religion, ethics, political thought, and the arts; Medieval world view, Renaissance, Reformation, Scientific Revolution, the Enlightenment, Romanticism. Prereq: HIST 101, 102.

450/650 Ancient History 3
Cultural, political, economic, military, and social history of the ancient Near East, Greece, and Rome.

451/651 Medieval History 3
Cultural, political, economic, and social history of the Middle Ages.

454/654 Renaissance and Reformation 3
Political, social, and economic history of continental Europe from 1400 to 1650; with a focus on Renaissance and Reformation.

455/655 The Eighteenth Century 3
Political, social, and economic history of continental Europe from 1650 to 1815; with a focus on Enlightenment and French Revolution.

456/656 Europe 1815-1914 3
Political, social, and economic history of Europe from the defeat of Napoleon to outbreak of World War I.

457/657 Europe Since 1914 3
Political, social, and economic history of Europe including World War I, the Russian Revolution, Nazism, World War II, and the postwar era.

460/660 History of England I 3
England from ancient times to the Hanoverian Succession (1714); emphasis on the Middle Ages and the Tudor-Stuart period.

461/661 History of England II 3
England from 1714 to the present; emphasis on the Georgian Era industrialization, liberalism, social reform, and the impact of World War I and World War II.

466/666 History of Russia I 3
Cultural, diplomatic, intellectual and political history of Russia; evolution of the Russian state, expansion of Imperial Russia, Great Reforms, populism, and socialism.

467/667 History of Russia II 3
Cultural, diplomatic, intellectual, and political history of Russia and the Soviet Union; agriculture, industry, Marxism in Russia, revolution of 1905 and 1917, and the Soviet Union from Lenin to present.

470/670 Modern Latin America I 3
Examines the social, economic, political, and cultural developments in Latin American history. Begins with the wars of independence (circa 1800) and concludes with the emergence of modern states at the close of the 19th century.

471/671 Modern Latin America II 3
Study of important social, economic, political, and cultural developments in Latin America from the late 19th century through the modern epoch.

473/673 Mexico I 3
Study of the important social, economic, political, and cultural developments in Mexico from the pre-Columbian epoch through the wars for independence, ending in 1821.

474/674 Mexico II 3
Study of the important social, economic, political, and cultural developments in Mexico from independence in 1821 through the contemporary era.

476/676 Southwestern Borderlands to 1848 3
Study of the important social, economic, political, and cultural developments of the American southwest from the pre-Columbian epoch, through Spanish and Mexican ownership, to U.S. acquisition in 1848.

480/680 Recent East Asia I 3
Political and diplomatic history of China, Japan, Korea, and Vietnam; interactions between East Asian countries and Western powers, World War I and aftermath in East Asia.

481/681 Recent East Asia II 3
Political and diplomatic history of China, Japan, Korea, and Vietnam; World War II in the Pacific, communism in China, Korea, and Vietnam, and the industrialization of Japan and Korea.
489 Senior Seminar
Capstone experience focused on understanding major concepts and applying knowledge of basic methods and problems. Students evaluate secondary literature, conduct primary research, and master standard forms of historical writing.

701 Methods of Historical Research
Techniques and frameworks of historical research, introduction to types of evidence, and evaluation of sources. Taken during the student's first semester in the program.

702 Historiography
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.

705 Directed Research
Directed research on the student's thesis prospectus. Taken close to the end of the student's course work. Prereq: HIST 701.

489 Senior Seminar
3
Capstone experience focused on understanding major concepts and applying knowledge of basic methods and problems. Students evaluate secondary literature, conduct primary research, and master standard forms of historical writing.

701 Methods of Historical Research
3
Techniques and frameworks of historical research, introduction to types of evidence, and evaluation of sources. Taken during the student's first semester in the program.

702 Historiography
3
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.

HUMAN AND COMMUNITY EDUCATION (H&C)

Borr, Young

COURSES

232 Philosophy and Policy (CCN) 3
Principles, philosophies, development, and implementation of agricultural education, family and consumer sciences education, and extension programs. Analysis of evolving concepts with emphasis on history, legislation, and principles underlying organization and practice.

341 Leadership and Presentation Techniques (CCN) 3
Development of youth leadership professionals in educational settings; methods, principles, and practices in organizing, developing, conducting, and evaluating community-based student organizations and student leadership programs.

381 Early Experience (CCN) 1
See Education for description.

444 Planning the Community Program in Agricultural Education 3
Determining resources and trends of local communities. Emphasis on agricultural education program policies; planning and managing the primary program components; strategies for the management and organization of youth and adult programming in agricultural education. Prereq: Admission to School of Education.

445 Technology Transfer in Agriculture 3
Methods of formal and informal educational programs. Attitudes and values as influences on the introduction and acceptance of new and emerging technologies. Emphasizes global issues. Prereq: H&C 341.

446/646 [345] Extension Education 2
Determining resources and trends of local communities. Emphasis on agricultural education program policies; planning and managing the primary program components; strategies for the management and organization of youth and adult programming in agricultural education.

468 Family Life and Adult Education Programs 3

469 Housing Education and Issues 3
Issues, curricula, and techniques for teaching and evaluating K-12 and adult housing programs.

474 Extension Internship 4
Supervised full-time family and consumer sciences extension internship in an approved location. Prereq: H&C 345.

481/681P Methods of Teaching Agriculture 3
Methods of planning and teaching agricultural education in secondary and post-secondary settings. Learning theories, innovations and advanced principles in teaching methods and materials, and ethics. Prereq: EDUC 321, 322, admission to School of Education.

482/682P Methods of Teaching Family and Consumer Sciences 3
Methods of planning and teaching consumer/homemaking and occupational family and consumer sciences in middle and secondary schools in diverse cultural settings.

74/687P Student Teaching 9
See Education for description.

488/688P Applied Student Teaching 3
See Education for description.

724 Program Development in Vocational Education 2
Methods and curricula development in vocational family and consumer sciences education in accordance with state and federal guidelines. Includes long-range and strategic planning competencies.

730 Readings in North American History 3
This course requires preparation of a research paper. The subject of the research will be within an announced general topic area of North American history. May be repeated.

714 Research Seminar in World History 3
This course requires preparation of a research paper. The subject of the research will be within an announced general topic area of European history. May be repeated.

730 Readings in North American History 3
A historiographical survey of a selected topic in North American history. Topics vary by semester. May be repeated. Recommended coreq: HIST 701.

760 Readings in European History 3
Historigraphical survey of a selected topic in European history. Topics vary by semester. May be repeated. Recommended coreq: HIST 701.

780 Readings in World History 3
Historigraphical survey of a selected topic in World history. Topics vary by semester. May be repeated. Recommended coreq: HIST 701.

HONORS (HON)

Homan, Coordinator

COURSES

386 World Literature: Imaginary Homelands 3
Reading and discussion of works from literatures around the world, including philosophical non-fiction, emphasizing the diversity of responses to the human condition. Prereq: Admission to Honors Program.

489 Senior Thesis 1-6
Primary research or creative activity under the guidance of a faculty member.
focusing on the knowledge, skills, and attitudes necessary to effectively use a variety of technological applications.

775 Internship 1-3
Supervised experience in a formal or informal environment relevant to the application of educational principles. Setting may include middle, secondary, post-secondary, and adult programs.

777 Evaluation in Family and Consumer Sciences 2
Examination of the role of course assessment, teacher effectiveness, facilities, equipment, and staffing patterns in program evaluation. Review of research on evaluation and exploration of alternative evaluation models.

781 Professional Development in Agricultural Education 1-3
Continued professional development in technical and pedagogical subjects of current importance for professionals in agricultural education.

787 Issues in Education 1-3
Exploration and assessment of a current issue associated with middle and secondary applied academic programs. Prereq: Current employment or experience as middle/secondary teacher.

HUMAN DEVELOPMENT AND EDUCATION (HD&E)

COURSES

189 Skills for Academic Success 1
See University Interdisciplinary Studies for description.

220 Individual and Family Wellness 2
Integrative investigation of the wellness of individuals and families in today’s complex society. The interdisciplinary nature of human wellness is examined critically and means of optimizing lifelong wellness are addressed. 2 lectures.

320 Professional Issues 1
Analysis and integration of professional perspectives and trends; life career development skills (self-assessment, resume writing, interviewing, and correspondence.) 1 lecture. Prereq: Junior standing.

777 Advanced Stress Management 3
The dynamics of stress, sources and symptoms of stress, and stress management techniques will be presented. Research in stress from the interdisciplinary perspectives of wellness, applied gerontology, and counseling.

HUMANITIES (HUM)

Cater (Emeritus), Flood, Wargo

COURSES

256 Questions of Philosophy 3
Introduction to philosophy, some of its major problems and personalities.

257 Traditional Logic 3
Study of the art and science of critical thinking; scientific method emphasized. Cross-listed with PHIL.

304 Humanities Tutorial R-6
Development of an individual project based on the theme of the student’s program. This project must be submitted and approved during the junior year.

356 Ancient Philosophy 3
An overview of the main philosophical thinkers and positions in the ancient world. Among the key thinkers addressed are Socrates, Plato, and Aristotle. Cross-listed with PHIL.

357 Medieval Philosophy 3
An overview of the main philosophical thinkers and positions in the medieval period of western civilization. The key thinkers addressed are Augustine, Aquinas, and Scotus.

366 Metaphysics 3
Historical and systematic philosophical study of fundamental principles of reality, especially as concerns the human person. Cross-listed with PHIL.

367 Ethics: The Acting Person 3
Philosophical study of the foundations of human actions, virtue, and vice.

369 Philosophy of Religion 3
An introduction of the philosophical analysis of the core concepts of religion, focusing on the possible existence and nature of God, understood philosophically as the maximally perfect being. Cross-listed with PHIL.

371 The Law and the Prophets 3
How to interpret the central documents of the faith of Israel for contemporary readers by attending to their distinctive literary structures.

372 Wisdom and the New Testament 3
Study of special themes in Wisdom and Apocrypha. Introduction to principal New Testament authors.

385 Comparative Arts 3
Study of Western arts in light of the aesthetic, social, and philosophical ideas that nurtured them.

405 Topics in Philosophy 3
A detailed study of a particular thinker or topic. May be repeated.

476 History of Philosophy: Modern Period 3
An overview of the main philosophical thinkers and positions in the modern period of western civilization. Among the thinkers addressed are Descartes, Leibniz, Locke, Hume, and Kant. Cross-listed with PHIL.

477 Contemporary Philosophy 3
An overview of the main philosophical thinkers and positions in the contemporary period. Cross-listed with PHIL.

486 Philosophy and Literature 3
Philosophical elements of selected works from Western literature, such as those of Dante, More, Milton, and Newman. Cross-listed with PHIL.

487 Aesthetics 3
Principles of aesthetics as revealed by artists, writers, and philosophers. Cross-listed with PHIL.

488 Epistemology 3
A detailed study of the philosophical analysis of the nature of knowledge and associated concepts. Prereq: HUM 257.

702 Introduction to College Teaching in the Humanities and Social Sciences 3
Techniques for effective teaching and assessing learning at the college level. Includes special issues and responsibilities related to college-level teaching. Cross-listed with COMM.

INDUSTRIAL AND MANUFACTURING ENGINEERING (IME)
Farahmand, Chair; Bilen Green, Cook, Maleki, Marinov, Shi, Wells, Yadav, Zhang

COURSES

111 Introduction to Industrial and Manufacturing Engineering 3
Overview of industrial engineering and manufacturing engineering professional careers and work environments. Basic skill acquisition using computer software tools to solve engineering problems, prepare reports, plan projects, deliver professional presentations, and manage data.

311 Work/Station Design and Measurement 3
Analytical methods for measuring human performance in industrial, commercial and manufacturing settings. Development of work procedures and design of workstations. Considerations of ergonomics, safety, performance effectiveness and efficiency, interactions between workstations, information and data requirements, production throughput, training and skill requirements, and resources. Weekly laboratory.

320 Aircraft Corrosion Theory and Control 2
Examination of fundamental mechanisms of corrosion; procedures for prevention and control. Emphasis on aircraft structures and their manufacture. Weekly laboratory. Prereq: ME 331. S/2 (odd years)

330 Manufacturing Processes 3
Traditional manufacturing processing methods as employed in contemporary practice. Includes properties of materials, machining, casting, forming, and fabrication techniques. Several experiments will be conducted on various manufacturing processes in the laboratory.

335 Welding Technology 2
Study of arc and gas welding technology together with related metallurgy. Laboratory instruction in welding techniques and skills. 1 recitation, 1 two-hour laboratory. F

380 CAD/CAM for Manufacturing 3
Coverage of CAD, numerical control, and CAM software. Use of manufacturing standards for geometric dimensioning and tolerancing. Prereq: ME 212. F

411/611 Human Factors Engineering 3
A survey of human factors engineering topics with an emphasis on optimizing person-machine and person-system interactions. Human physical and cognitive capabilities will be investigated to improve work design, interface design, and usability. Prereq: IME 311, 460. F/2 (even years)

420/620 Aircraft Design for Manufacturing 3
Introduction to aircraft structures and their manufacturing processes through on-line materials. Students will create PowerPoint audio-visual presentations of self-selected in-plant case studies, and connect with Design for Manufacturing (DFM) industry applications through contributing to a journal publication on DFM use in the aircraft industry. Graduate students will propose a state-of-the-art research activity to improve DFM theory and applications. Prereq: IME 330. F/2 (odd years).
Course Descriptions

422 Aircraft Structural Repair and Overhaul
Applied design and manufacturing engineering methods are used to write Federal Aviation Administration (FAA) approved airframe/engine repair and overhaul (remanufacturing) procedures. Weekly laboratory. Prereq: IME 330. S/2 (even years)

425 Aircraft Component Failure Analysis
Presentation of metallurgical failure conditions and analysis methods. Study of airframe and engine component failures. Weekly laboratory. Prereq: IME 330. F/2 (even years)

427/627 Electronics Manufacturing
Process and production engineering for manufacturing of electronic components; specialty materials, process parameters, production system design factors, production performance metrics. Introduction to concurrent engineering applied to development of electronic products. Open to all engineering majors. Prereq: Junior standing. F/2 (odd years)

430/630 Process Engineering
Comprehensive analysis of selected manufacturing processes; development of process flow maps, schematic and mathematical modeling of process dynamics, and evaluation of processing alternatives. Design of effective and efficient processes for selected industrial products. Seminar/case study format. Prereq: IME 330. F

431/631 Production Engineering

432 Composite Materials Manufacturing

435/635 Plastics and Injection Molding Manufacturing
Product and process engineering for manufacturers of plastic products; material evaluation and selection, mold design, process design, quality evaluation of manufactured plastic parts. Cross-listed with ME.

440/640 Engineering Economy
Capital investment decision foundation within the rules of general and project accounting. Analysis of benefits and returns against cost for engineering installation, operation, life cycle, and buy-rent-lease decisions. Prereq: Junior standing or IME major.

450/650 Systems Engineering and Management
Integration of technical disciplines through the stages of systems life cycle: needs and requirements determination, operating and support concepts, design and prototyping, test and evaluation, facilitation, manuals, training, and supportability. Prereq: Junior standing. F

451/651 Logistics Engineering and Management
This course emphasizes integrated logistics management methods to improve the effectiveness and efficiency of material flow, information flow and cash flow for the entire supply chain. Prereq: IME 470. Coreq: IME 450. F/2 (odd years)

452/652 Integrated Industrial Information Systems
Integration of technical, business, and operational information for status, progress, and decision making in product development, manufacturing, and logistical support of product and customers. Prereq: IME 450. S

453/653 Hospital Management Engineering
Survey of management engineering roles in the delivery of health care. Review of functional relationships present in health care delivery systems. Application of industrial engineering tools to solve health care delivery problems focused on cost control, process redesign, facility design, quality improvement, and systems integration. Prereq: Core IME courses. S/2 (even years)

455/655 Management of People Systems
Study of traditional management functions (planning, organizing, influencing, and controlling) in the context of engineering and management system interactions. Emphasis on communication skills, teaming, job design, leadership, facilitation, and improving employee productivity. Prereq: Junior standing. F

456/656 Program and Project Management
Capstone experience. Integration of technical, business, and operational specialties in a project consulting firm. Work with multidisciplinary teams that design, plan, and present for a variety of industrial clients. Prereq: Senior standing. S

460/660 Evaluation of Engineering Data
Design of engineering experiments and evaluations, curve fitting, regression, hypothesis testing, ANOVA, Taguchi methods in engineering design. Coreq: MATH 166. F, S

461/661 Quality Assurance and Control
Proactive and reactive quality assurance and control techniques; emphasis on quality planning, statistical process control, acceptance sampling, and total quality management. Issues in reliability and maintainability engineering. Prereq: IME 460/660. S

462/662 Total Quality in Industrial Management
The meaning and means for achieving "total quality" in all dimensions of industrial activities and organizations. Topics include continuous improvement, statistical process control, leadership, and training. F/2 (even years)

463/663 Reliability Engineering
Study and application of statistical models and methods for defining, measuring and evaluating reliability of products, processes and services: life distributions, reliability functions, reliability configurations, reliability estimation, parametric reliability models, accelerated life testing, reliability improvement. Prereq: IME 460/660. S/2 (odd years)

470/670 Operations Research I
Techniques to optimize and analyze industrial operations. Use of linear programming, transportation models, networks, integer programming, goal programming, dynamic programming, and non-linear programming. Prereq: MATH 129, 265. S

472/672 Simulation of Business and Industrial Systems
Development of the fundamentals and techniques of simulating business and industrial systems. Monte-Carlo techniques and computer usage. Prereq: IME 460/660, high-level computer language. S

480/680 Production and Inventory Control
Planning and controlling of industrial production and inventory: demand forecasting, master scheduling, materials requirements planning, job scheduling, assembly line balancing, and just-in-time production. Prereq: IME 460/660. F

482/682 Automated Manufacturing Systems
Design of integrated production systems including flexible, programmable automatic control for fabrication, assembly, packaging, movement, and storage. Numerical control, flexible manufacturing systems, and computer integrated manufacturing, 2 recitations, 1 three-hour laboratory. Prereq: IME 311, 330, PHYS 252. F

485/685 Industrial and Manufacturing Facility Design
Capstone integration of analysis and design tools to convert product design into production plans and plants. Prereq: Senior standing. S

489 Manufacturing Engineering Capstone
Capstone experience. Student projects in design, analysis, and experimental investigation related to manufacturing. Prereq: Senior standing. S

711 Advanced Human Factors Engineering
Research-based study of current human factors engineering problems. Students will review current human factors topics, design and conduct research studies, and produce technical papers reporting results. Prereq: IME 411/611, 460/660. F/2 (odd years)

720 Surface Engineering

740 Advanced Engineering Economy
Advanced topics in engineering economy including replacement analysis, capital budgeting, income tax effects on equipment selection, probabilistic models, and manufacturing costing. Prereq: IME 440/640. F/2 (odd years)

761 Quality Engineering
Study and application of advanced statistical tools and techniques for defining, monitoring and improving quality of products, processes and services: statistical control charts, process capability analysis, acceptance sampling of variables and attributes, application of design-of-experiments for product and process optimization, response surface methodology, Taguchi methods. Prereq: IME 461/661. F/2 (odd years)

765 Data Analysis
Applications oriented. Topics include: statistical estimation, hypothesis testing, non-parametric methods, design of experiments, factorial experiments, response surface methodology, regression analysis, time series analysis and forecasting, multivariate methods, statistical control charts. Prereq: IME 460/660.
770 Advanced Operations Research Topics 3
Study of the theory and applications of linear programming, network flows, and nonlinear programming. Prereq: IME 470/670. F, S (odd years)

772 Advanced Simulation 3
In-depth study of special purpose simulation languages to model, analyze, and design industrial and engineering systems. Stochastic and deterministic methods are included. Prereq: IME 472/672. S (even years)

774 Neural Networks 3
See CSCI 735 for description.

780 Advanced Production and Inventory Control 3
Study of the theory and applications of production scheduling, inventory management, production planning, just-in-time production, and materials requirement planning. Prereq: IME 480/680. F (even years)

782 Robotics/CAD/CAM/Control Systems 3
Study of automation, integration of fabrication, and assembly systems. Includes automated material handling and intelligent control systems. Prereq: IME 482/682. S, F (odd years)

784 Computer Integrated Manufacturing 3
Study of the continuum of integrated manufacturing processes where computer technology is incorporated in the conception, design, planning, and fabrication of a good or service. The study of philosophy and methods of systemically building flexible and efficient production systems. Prereq: IME 482/682. S, F (even years)

785 Facilities Location 3
Theory and methods of locating facilities. Domains include plant and warehouse siting, emergency service sites, vehicle and hazardous material routing, distribution systems design. Topics include planar single and multifacility models, network location problems, cyclical networks. Prereq: IME 470/670 or ENGR 770.

786 Manufacturing Systems Analysis 3
Comprehensive analysis of complex issues in the technology and management of modern manufacturing systems and enterprises. Technological issues will impinge on product realization, production of goods, and manufacturing equipment and facilities; management issues addressed will be those drawn from operation of global production enterprises. Seminar format. Prereq: IME 630 or 631 (both preferred). S

LANDSCAPE ARCHITECTURE (LA)
Gleye, Chair; Famulari, M. Lindquist, Pepple, Wiley

COURSES
132 Introduction to Landscape Architecture Studio 2
Laboratory surveying the profession of landscape architecture and exploring problem solving through the design process. Graphic, oral, and written design presentation skills including the use of computer applications.

231 Landscape Architecture Graphics 1

232 Design Technology 2
See Architecture for description.

242 Elements of Surveying 2
Surveying for landscape architecture and other non-engineering students. Importance of measurements and errors and use of surveying instruments for obtaining field data and valid measurements. 1 one-hour lecture, 1 three-hour laboratory. Prereq: MATH 104. Recommended: MATH 105.

271 Landscape Architecture I 4
Entry-level design generation methods involving concept formation, site inventory and analysis, programming, and simple site organization and planning. Problem solving through graphic, computer-generated, and model development; oral and written communication skills. Prereq: LA major, LA 131. Coreq: LA 231.

272 Landscape Architecture II 4
Continued design development in site organization and planning. Design issues in natural resources, land reclamation, construction technology, and rural development. Intermediate problem solving through two- and three-dimensional graphic techniques; continued oral and written communication skills. Prereq: LA major, LA 271.

322 History of Landscape Architecture 4
Global overview of the landscape developments from prehistoric civilizations through the 20th century using styles and trends. Emphasis on analyzing historic places and locations as a problem-solving method.

331 Introduction to Planting Design 2-3
Exploration of principles and design methods involved with a wide-range of planting zones and plant habitats throughout North America. 2 credits: Lecture, open to LA majors. 3 credits: Lecture and laboratory; open to LA majors and minors only.

341 Site Development and Detailing I 4
Intermediate investigations into site planning and design development with a primary focus on site design integration with the technically related concepts. Prereq: for LA majors: 2nd year standing, For ARCH majors: ARCH 272.

342 Site Development and Detailing II 4
Intermediate-level focus on fundamental site landscape and engineering issues within the construction process. Emphasis on site grading and storm water management. Lecture. Prereq: Junior standing for non-majors.

344 Site Development and Detailing Laboratory 2

351 Landscape Design 3
Focus on small-scale residential and commercial landscape design with an emphasis on design communication. Instrumental in traditional and computer-assisted drafting, plant installation, landscape detailing, cost estimation, and landscape specifications. Prereq: LA 132.

371 Landscape Architecture III 4
Visual problem solving and large-scale site planning issues. Two-part focus involving the comprehensive visual inventory and analysis along with the immediate application of site planning and design skills. Studio. Prereq: LA major, LA 272.

372 Landscape Architecture IV 4
Cultural and environmental design issues as they relate to large-scale land planning and site design involved with residential communities. Emphasis within the studio involves site engineering and design detailing. Prereq: LA major, LA 371.

441 Site Development and Detailing III 3
Advanced exploration into the use of computers and computer-aided design as part of the landscape architecture construction documentation process. Seminar/laboratory. Prereq: LA 372. Coreq: LA 471.

471 Advanced Landscape Architecture I 6
Regional systems inventory, visual survey, analysis techniques, and methodologies for design problem solving through graphic, computer, and modeling development. Focus on urban studies and site planning. Studio. Prereq: LA major, LA 372.

472 Advanced Landscape Architecture II 6
Natural resource and land reclamation management techniques as part of contemporary design in landscape architecture. Emphasis on presentation and communication, Capstone course. Studio. Prereq: LA major, LA 471.

531 Advanced Landscape Architecture Planting Design 4
Exploration into the complexity of planning, design, and management of plant communities with an emphasis on natural systems ecology. Lecture and laboratory. Prereq: LA major, LA 331. F (odd years)

552 Advanced Landscape Planning 2
Theories and practices facing landscape architects and planners in the design of urban, suburban, and rural landscapes. Seminar/field trip. Prereq: Senior standing.

563 Programming and Thesis Preparation 3
See ARCH 663 for description. Prereq: LA 472.

571 Advanced Landscape Architecture Design III 6

572 Design Thesis 8
Capstone opportunity as a culmination of design education. Student generated design topic is fully developed and realized from master planning through design development, detailing, and documentation. Prereq: LA 563, 571.

581 Professional Practice 3
See ARCH 681 for description. Prereq: LA 472.

LIBRARY SCIENCE (LIB)

COURSE
121 Introduction to Library Research 1
Basic information on libraries and their services. Exploration of sources of information in print and computer format; explanation of basic library research strategies.
MANAGEMENT INFORMATION SYSTEMS (MIS)
Bowlin, Head; Allenburg, Latimer, Zhang

COURSES
(All courses 300 level and above require a minimum of Junior standing and a 2.50 cumulative GPA.)

277 Introduction to UNIX
See Computer Science for description.

370 Management Information Systems
Introduction to basic concepts and developments in information technology. Overview of the opportunities and challenges in the development and management of organizational information systems from a socio-technical perspective. Prereq: CSCI 116.

371 Web Scripting Languages
See Computer Science for description.

375 Database Design for Business Application
Fundamentals of conceptualizing and implementing databases. Emphasis is on using query languages to obtain information for decision-making. Includes managerial topics related to database administration, security, integrity, optimization, and distributed databases. Prereq: MIS 370, CSCI 228.

376 Data and Telecommunications Administration
Introduction to a wide variety of topics in the voice and data communications field. Prereq: MIS 370, CSCI 228.

470 Information Systems
Exploration of managerial issues pertaining to administration of the information systems function in organizations. Issues include planning, operations, control, electronic commerce, and other current topics. Prereq: MIS 376, CSCI 315. Coreq: MIS 375.

479 Decision Support and Intelligent Systems
Information system support and modeling of the decision-making process via expert systems, neural networks, and hybrid intelligent systems are the primary focus of this course. The state-of-the-art in knowledge management will be explored. Prereq: CSCI 228, MIS 370.

770 Information Resource Management
Examination of the role of information resources in supporting a wide range of organizational functions by providing a managerial perspective on the use, design, and evaluation of information systems. Focus is managerial rather than technical.

MATERIALS AND NANOTECHNOLOGY (MNT)

COURSES
All courses require graduate standing in science, engineering, or pharmacy.

729 Materials Characterization
Covers basic techniques and methods for characterization of materials, x-ray diffraction and electron microscopy will be discussed in detail. Also covered will be spectroscopies, NMR, FTIR and Raman.

730 Nanotechnology and Nanomaterials
Reviews principles of nanotechnology, nanomaterials and develops a framework for their understanding. The basic tools of nanotechnology: nanoscale characterization, physics and materials design will be discussed in the context of current engineering applications.

732 Electronic Properties of Materials
Describes the fundamental sciences and engineering concepts involved in the design, fabrication, operation, and application of electronic materials.

735 Optoelectronic Materials and Processing
This course covers the basic principles of semiconductor optoelectronic devices and their processing techniques. Students will learn the methods used for their fabrication and also current applications and limits of such technologies in nanotechnology.

745 Preparing Future Researchers
Involves presentations given by invited faculty from various academic institutions ranging from research oriented to teaching oriented and also R&D project leaders in companies.

756 Molecular Modeling of Materials
Covers basic fundamentals of molecular statics, molecular dynamics, Monte Carlo modeling techniques and allows students to be able to model complex lattice structures, structures of lattice defects, crystal surfaces, and interfaces.

760 Materials Synthesis Processing
Deals with synthesis and processing issues in materials design.

783 Nanomechanics
Covers essential tools (quantum mechanics, molecular dynamics, statistical physics, continuum mechanics) used at the nanoscale. The course will present methods that bridge atomistic and continuum models and discuss these techniques in the context of material design.

MATHEMATICS (MATH)
Coykendall, Chair; Alfonseca, Barabanov, Bocca, Ciuperca, Gomez, Cope, Duncan, Hodge, Littmann, Martin, Olsen, Popovici, Sather-Wagstaff, Shreve, Ungar

COURSES

101 Elementary Algebra
Fundamental operations, factoring, fractions, exponents and radicals, equations. For students with little or no background in algebra. Offered through Continuing Education. Special fee required. Does not satisfy any requirements for graduation.

102 Intermediate Algebra (CCN)
Properties of the real number system, factoring, linear and quadratic equations, functions, polynomial and rational expressions, inequalities, systems of equations, exponents, and radicals. Offered through Continuing Education. Special fee required. Does not satisfy any requirements for graduation. Prereq: MATH 101 or placement test.

103 College Algebra (CCN)
Relations and functions, equations and inequalities, complex numbers; polynomial, rational, exponential and logarithmic functions; systems of equations, matrices and determinants, sequences and summation. Prereq: MATH 102 or placement test. (ND:MATH)

104 Finite Mathematics (CCN)
Systems of linear equations and inequalities, matrices, linear programming, mathematics of finance, elementary probability and descriptive statistics. Prereq: MATH 102 or placement test. (ND:MATH)

105 Trigonometry (CCN)
Angle measure, trigonometric and inverse trigonometric functions, trigonometric identities and equations, polar coordinates and applications. Prereq: MATH 103, 107, or placement test.

107 Precalculus (CCN)
Equations and inequalities; polynomial, rational, exponential, logarithmic and trigonometric functions; inverse trigonometric functions; algebraic and trigonometric methods commonly needed in calculus. Prereq: Placement test. An expedited, combined offering of MATH 103 and 105.

128 Introduction to Linear Algebra
Systems of linear equations, row operations, echelon form, matrix operations, inverses, and determinants. Prereq: MATH 105 or 107. Credit awarded only for MATH 128 or 129, not both.

129 Basic Linear Algebra
Includes content of MATH 128 with the addition of vectors in n-space, subspaces, homogeneous systems, linear independence, rank, and dimension. Prereq: MATH 105 or 107. Credit awarded only for MATH 128 or 129, not both.

146 Applied Calculus I (CCN)
Limits, derivatives, integrals, exponential and logarithmic functions and applications. Prereq: MATH 103, 107, or placement test. (ND:MATH)

147 Applied Calculus II (CCN)
Definite integrals, double integrals, trigonometry, introduction to differential equations, infinite sequences and series, probability and applications. Prereq: MATH 146.

165 Calculus I (CCN)
Limits, continuity, differentiation, Mean Value Theorem, integration, Fundamental Theorem of Calculus and applications. Prereq: MATH 105, 107, or placement test. (ND:MATH)

166 Calculus II (CCN)
Applications and techniques of integration; polar equations; parametric equations; sequences and series, power series. Prereq: MATH 165.

259 Multivariate Calculus
Functions of several variables, vectors in two and three variables, partial derivatives, surfaces and gradients, tangent planes, differentials, chain rule, optimization, space curves, and multiple integrals. Prereq: MATH 166. Credit awarded only for MATH 259 or 265, not both.

265 Calculus III (CCN)
Multivariate and vector calculus including partial derivatives, multiple integration, applications, line and surface integrals, Green’s Theorem, Stoke’s Theorem, and Divergence Theorem. Prereq: MATH 166. Credit awarded only for MATH 259 or 265, not both.

266 Introduction to Differential Equations (CCN)
Solution of elementary differential equations by elementary techniques. Laplace transforms, systems of equations, matrix methods, numerical techniques, and applications. Prereq: MATH 259 or 265. Coreq: MATH 128, 129, or 429.
370 Introduction to Abstract Mathematics 3
Sets, symbolic logic, propositions, quantifiers, methods of proof, relations and functions, equivalence relations, math induction and its equivalents, infinite sets, cardinal numbers, number systems. Prereq: MATH 166.

374 Special Problems in Mathematics 1
Diverse and challenging mathematical problems are considered with the intent of preparing the student for the Putnam Mathematics competition. May be repeated for credit. Pass/Fail only. Prereq: MATH 270.

376 Actuarial Exam Study 1
Selected material from calculus, linear algebra, numerical analysis, and other areas that appear on national actuarial exams. May be repeated for credit. Pass/Fail only. Prereq: MATH 266, 429.

420/620 Abstract Algebra I 3
Groups, permutations, quotient groups, homomorphisms, rings, ideals, integers. Prereq: MATH 270.

421/621 Abstract Algebra II 3
Division rings, integral domains, fields, field extensions, Galois Theory. Prereq: MATH 420/620.

429/629 Linear Algebra 3
Vector spaces, linear transformations, eigenvalues and eigenvectors, canonical forms, inner product spaces, and selected applications. Prereq: MATH 270.

430/630 Graph Theory 3
Graphs and directed graphs, graph models, subgraphs, isomorphisms, paths, connectivity, trees, networks, cycles, circuits, planarity, Euler's formula, matchings, bipartite graphs, colorings, and selected advanced topics. Prereq: MATH 270.

435/635 Mathematical Models of Biological Processes 3
This course provides an introduction to mathematical methods in biology. Prereq: MATH 270.

436/636 Combinatorics 3
Recurrence relations, formal power series, generating functions, exponential generating functions, enumeration, binomial coefficients and identities, hypergeometric functions, exponential generating functions, elementary conformal mapping, integral theorems, power series, Laurent series, residue theorem, and contour integration. Prereq: MATH 265.

460/660 Intensive Mathematica 1
Thorough overview of the general purpose mathematical software MATHEMATICA: numerical and symbolic calculations for algebra and linear algebra, single and multivariable calculus, ordinary and partial differential equations, 2D- and 3D-graphics, animation, word processing. Prereq: MATH 259 or 265.

472/672 Number Theory 3
Properties of integers, number theoretic functions, quadratic residues, continued fractions, prime numbers and their distribution, primitive roots. Prereq: MATH 270.

473/673 Cryptology 3
This course provides an introduction to the methods of cryptography. Classical and modern ciphers are studied from both a cryptographic and cryptoanalytic point of view. Prereq: MATH 270 or graduate standing.

480/680 Applied Differential Equations 3
Power series expansions and the method of Frobenius, special functions and their use (Bessel functions, Legendre polynomials); phase plane analysis. Prereq: MATH 266.

481/681 Fourier Analysis 3
Discrete and continuous Fourier transforms, Fourier series, convergence and inversion theorems, mean square approximation and completeness, Poisson summation, Fast-Fourier transform. Prereq: MATH 265.

482/682 Survey of Mathematical Models 3
Lagrangian and Hamiltonian dynamics, potential theory, diffusion, hydrodynamics, elasticity; dimensional analysis, tensors; emphasis on how physical concepts are formulated mathematically rather than solution methods. Prereq: MATH 266.

483/683 Partial Differential Equations 3
Solution methods for potential, diffusion and wave equations; treatments of homogeneous and nonhomogeneous equations; boundary conditions; separation of variables, Greens' functions, transform techniques. Prereq: MATH 480/680.

488/688 Numerical Analysis I 3
Numerical solution of nonlinear equations, interpolation, numerical integration and differentiation, numerical solution of initial value problems for ordinary differential equations. Prereq: MATH 266.

489/689 Numerical Analysis II 3

720, 721 Algebra I, II 3 each
Graduate level survey of algebra: groups, rings, fields, Galois theory, and selected advanced topics. Prereq: MATH 421/621.

724 Topics In Commutative Algebra 3
Topics vary each time the course is offered and may include: dimension theory, integral dependence, factorization, regular rings, Cohen-Macaulay rings, Gorenstein rings. May be repeated for credit with change in topic. Prereq: MATH 721.

725 Theory of Rings II 3
The ideal theory of commutative rings, structure of (noncommutative) rings, and selected advanced topics. Prereq: MATH 721.

726 Homological Algebra 3
An overview of the techniques of homological algebra. Topics covered will include categories and functors, exact sequences, (co)chain complexes, Mayer-Vietoris sequences, TOR and EXT. Applications to other fields will be stressed. Prereq: MATH 421/621.

728, 729 Linear Algebra I, II 3 each

730, 731 Graph Theory I, II 3 each

732 Introduction to Bioinformatics 3
An introduction to the principles of bioinformatics including information relating to the determination of DNA sequencing. Prereq: STAT 661. Cross-listed with CSCI and STAT.

736, 737 Discrete Mathematics I, II 3 each
Combinatorial reasoning, generating functions, inversion formulæ. Topics may include design theory, finite geometries, Ramsey theory, and coding theory. Advanced topics may include cryptography, combinatorial group theory, combinatorial number theory, algebraic combinatorics, (0,1)-matrices, and finite geometry. Prereq: MATH 436/636.

746, 747 Topology I, II 3 each
Topological spaces, convergence and continuity, separation axioms, compactness, connectedness, metrizability, fundamental group and homotopy theory. Advanced topics may include homology theory, differential topology, three-manifold theory and knot theory. Prereq: MATH 446/646.
749 Topics in Geometry and Topology 3
Advanced topics in Geometry and/or Topology. Topics vary but may include: differential geometry, K-theory, knot theory, or noncommutative geometry. May be repeated for credit with change in subtopic. Prereq: MATH 721, 751.

750, 751 Analysis I, II 3 each

752, 753 Complex Analysis I, II 3 each
Analytic and harmonic functions, power series, conformal mapping, contour integration and the calculus of residues, analytic continuation, meromorphic and entire functions, and selected topics. Prereq: MATH 451/651.

754, 755 Functional Analysis I, II 3 each
Normed spaces, linear maps, Hahn-Banach Theorem and other fundamental theorems, conjugate spaces and weak topology, adjoint operators, Hilbert spaces, spectral theory, and selected topics. Prereq: MATH 751.

756 Dynamic Systems 3
A study of basic notions of topological and symbolic dynamics. Introduction to measurable dynamics and ergodic theory. Ergodicity, mixing and entropy of dynamical systems. Prereq: MATH 750.

757 Topics In Functional Analysis 3
Maximal monotone operators and the Hille-Yosida theorem, Sobolev spaces in dimension one and applications, Sobolev spaces in higher dimensions, extension operators, Sobolev embedding theorems, Poincare inequality, duality. May be repeated for credit with change in subtopic. Prereq: MATH 750. Coreq: MATH 751.

760, 761 Ordinary Differential Equations I, II 3 each
Existence, uniqueness, and extendibility of solutions to initial value problems, linear systems, stability, oscillation, boundary value problems, difference equations, and selected advanced topics. Prereq: MATH 751.

762, 763 Integral Equations I, II 3 each
Existence and uniqueness of solutions of Fredholm and Volterra integral equations, Fredholm Theory, singular integral equations, and selected advanced topics. Prereq: MATH 751.

764 Calculus of Variations 3
Variational techniques of optimization of functionals, conditions of Euler, Weierstrass, Legendre, Jacobi, Erdmann, Pontryagin Maximal Principle, applications, and selected advanced topics. Prereq: MATH 451/651.

767 Topics In Applied Mathematics 3
Topics will vary and may include: Homogenization and Optimal Design, Mathematical Theory of Elasticity, Optimal Control, Imaging, Multiscale Modelling and Analysis, Robust Control, Stability Analysis. May be repeated for credit with change in subtopic. Prereq: MATH 750.

772, 773 Number Theory I, II 3 each
Number theoretic functions, algebraic number fields, prime numbers and their distribution, the Prime Number Theorem and related results, Fermat’s Theorem. Prereq: MATH 472/672.

777 Modern Probability Theory 3
See Statistics for description.

780 Methods of Optimization 3
See Computer Science for description.

781 Mathematical Control Theory 3
Standard optimal control and optimal estimation problems; duality; optimization in Hardly space; robust control design. Prereq: MATH 450/650.

782, 783 Mathematical Methods in Physics I, II 3 each
Tensor analysis, matrices and group theory, special relativity, integral equations and transforms, and selected advanced topics. Prereq: MATH 429/629, 452/652. Cross-listed with PHYS 752, 753.

784, 785 Partial Differential Equations I, II 3 each
Classification in elliptic, parabolic, hyperbolic type; existence and uniqueness for second order equations; Green’s functions, and integral representations; characteristics, nonlinear phenomena. Prereq: MATH 751.

786, 787 Mixed Boundary Value Problems I, II 3 each
Methods for transient and steady-state solutions of diffusion problems with mixed boundary conditions; integral transforms; Green’s function and integral equations formulations, asymptotics. Prereq: MATH 452/652 or 752.

788, 789 Numerical Analysis I, II 3 each
Numerical solutions to partial differential and integral equations, error analysis, stability, acceleration of convergence, numerical approximation, and selected advanced topics. Prereq: MATH 489/689.

MECHANICAL ENGINEERING (ME) 3
Kallmeyer, Chair; Akhatov, Azarni, Goplen, Karami, Mahmud, Nazari, Pieri, Selckwa, Stewart, Sumathy, Suzen, Tangpong, Ulven, Wu, Ziejewski

COURSES 3

189 Skills for Academic Success 1
See University Interdisciplinary Studies for description.

212 Fundamentals of Visual Communications for Engineers 3
Visual communications for design and manufacturing, computer-aided drawing and design, three-dimensional modeling and orthographic projections, geometric dimensioning and tolerancing, ASME Y14.5 1994 standard, sketching, parametric modeling, drawings and assemblies.

213 Modeling of Engineering Systems 3
Introduction to numerical methods used in the solution of engineering problems; computer methods, programming, and graphics; engineering system modeling and simulation; case studies. Prereq: MATH 129, ME 222. Coreq: MATH 266.

221 Engineering Mechanics I 3
Scalar and vector approaches to stresses, frames and machines, internal forces, friction forces, center of gravity, centroid, and moment inertia. Prereq: MATH 165.

222 Engineering Mechanics II 3
Dynamics of particles and rigid bodies, work energy, impulse-momentum, principles of conservation of energy and momentum. Prereq: ME 221, MATH 166.

223 Mechanics of Materials 3
Introduction to stress, strain, and their relationships; torsion of circular shafts, bending stresses, deflection of beams, stress transformations, buckling. Prereq: ME 221.

310 Introduction to Aviation 3
General introduction to aviation and preparation for FAA examination for Private Pilot License, study of FAA regulations, weather conditions, visual and radio navigation.

311 Introduction to Flight 2
Instruction in flight procedures, operation of aircraft, and introduction to solo flight. Completion of 15 hours of dual flight instruction required. Coreq: ME 311.

313 Commercial Instrument Ground School 3
Preparation of student for FAA written examination for Commercial Certificate and Instrument Rating License; study of commercial flight maneuvers and instrument flying and procedures. Prereq: ME 311 or holder of private pilot license. On demand.

331 Engineering Materials I 4
Characterization of microscopic structures and associated macroscopic properties and performance of mechanical engineering design materials (metals, ceramics, plastics) and processing effects. Includes laboratory. Prereq: CHEM 122, ME 223 and admission to professional program.

332 Engineering Materials II 3
Characterization of properties and processes in metals; diffusion, phase diagrams, phase transformation, creep, wear, corrosion, fracture, and fatigue. Prereq: ME 331 and admission to professional program.

341 Mechanics of Machinery 3
Application of solid mechanics principles and computer methods in designing mechanisms for function and performance. Prereq: ME 213 and admission to professional program.

350 Thermodynamics and Heat Transfer 3
Basic concepts, first and second laws of thermodynamics. Introduction to heat transfer principles. Prereq: ME 222. For non-mechanical engineering majors.

351 Thermodynamics I 3
Basic concepts, properties of pure substances and ideal gases. First and second law, entropy, and availability. Prereq: ME 222, MATH 259.

352 Fluid Dynamics 3
Foundations of the science of fluid dynamics. Basic concepts including thermodynamic principles applied to fluids. Development of conservation principles and applications. Prereq: ME 351 and admission to professional program.

353 Thermodynamics II 3
Continuation of thermodynamics. Cycle analysis, thermodynamic relations, mixtures, chemical reactions, and related topics. Prereq: ME 351 and admission to professional program.

412/612 Engineering Measurements* 3
Principles and characteristics of instruments used for engineering measurements, statistical analysis of data, signal conditioning, data acquisition systems. Includes laboratory. Prereq: ECE 303, ME 223 and admission to professional program.
472/672 Fatigue and Fracture of Metals
Causes and effects of fatigue failure and fracture of metals, analytical methods for fatigue design and fatigue life prediction, fatigue crack initiation and propagation, fatigue testing and validation. Prereq: ME 442 and admission to professional program.

473/673 Polymer Engineering
This course will introduce basic polymer materials including plastics, rubbers, adhesives; structures, properties, and relationships of polymers; additives; processing technologies, applications and development. Prereq: ME 331, 442 and admission to professional program. Coreq: ME 423.

474/674 Mechanics of Composite Materials
Materials, properties, stress, and strength analyses; engineering design and manufacturing aspects of short and continuous fiber-reinforced materials. Prereq: ME 351 and admission to professional program. Coreq: ME 423.

475/675 Automatic Controls
Introduction to industrial automatic controls. Theory and applications of pneumatic control, continuous process control, and programmable logic control. Demonstrations and discussion of the current industrial practice. Prereq: MATH 266 and admission to professional program.

476/676 Mechatronics
Design and development of mechatronic systems that require an integrated knowledge of mechanical engineering, electronics, computer science and control theory. Prereq: ME 412 or ME 475 and admission to professional program or graduate standing.

477/677 ME Finite Element Analysis
Introduction to the finite element method and its application to problems in mechanical engineering, including stress analysis. Prereq: ME 423 and ME 213 or ABEN 255 and admission to professional program.

479/679 Fluid Power Systems Design
Fluid dynamics principles and fluid properties are applied to the study of function, performance, and design of system components and system for power transmission and control purposes. Prereq: ME 352 and admission to professional program. Cross-listed with ABEN.

480/680 Advanced Fluid Dynamics
Formulation and solution of advanced problems in fluid dynamics; fluid dynamical phenomena in biological systems; analysis of cardiovascular and respiratory systems. Prereq: ME 352 and admission to professional program.

481/681 Fundamentals of Energy Conversion
Introduction to electric power generating systems and their major components such as turbines, boilers, condensers, and cooling towers. Prereq: ME 351 and admission to professional program.

482/682 Fuel Cell Science and Engineering
Fundamental principles, technologies, and applications of fuel cells, an emerging class of energy storage/conversion devices. Prereq: CHEM 121, ME 350 or 351 and admission to professional program.

483/683 Introduction to Computational Fluid Dynamics
Introduction to the methods and analysis techniques used in numerical solutions of fluid flow, heat and mass transfer problems of practical engineering interest. Prereq: ME 352 and admission to professional program.
725 Advanced Mechanics and Failure of Composites 3

726 Fracture Mechanics 3

731 Mechanical Behavior of Materials 3
Fundamental concepts of elastic, viscoelastic, and plastic deformation of materials; emphasizing atomic and microstructure-mechanical property relationships. Theory of static and dynamic dislocations; fracture, fatigue, and creep as well as strengthening mechanisms in materials. Recommended: ME 331, basic materials science course.

734 Smart Materials and Structures 3
Physics, chemistry, engineering principles and applications of smart materials and structures. Recommended: Any basic materials science (ME 331), solid state physics class (PHYS 401 or 485), or CPM 472/672, 474/674.

743 Biomechanics of Impact 3
Fundamental sciences of engineering and human anatomy that form the basis of biomechanics of soft tissue and bone under dynamic conditions. Recommended: ME 331.

751 Advanced Thermodynamics 3
Rigorous treatment of thermodynamic principles. Emphasis on the concept of availability methods as applied to various engineering systems. Recommended: ME 353.

753 Gas Dynamics 3
Fundamental concepts of fluid dynamics and thermodynamics used in the treatment of compressible flow, fractional flows, and flows with heat transfer or energy release. Recommended: ME 352.

754 Boundary Layer Theory 3
Fundamental laws of motion of a viscous fluid used in the consideration of laminar boundary layers, transition phenomena, and turbulent boundary layer flows. Recommended: ME 352.

755 Multiscale Fluid Dynamics 3
Fundamental principles of fluid dynamics in micro and nanoscales, with applications to nanotechnology and biotechnology. Recommended: ME 352.

761 Heat Transmission I 3

*Courses ME 612, 621, 642, and 654 are not acceptable for credit in graduate programs in Mechanical Engineering (M.S. or Ph.D.).

**MICROBIOLOGY (MICR)**

Fremont, Head; Berry, Dyer, Ebert, Gibbs, Gustad, Haggart, Khaitsa, Logue, McEvoy, Prüß, Richman, Schuh, Wolf-Hall

**COURSES**

202, 202L Introductory Microbiology, Lab (CCN) 2, 1
Study of the characteristics and importance of microorganisms with emphasis on their identification, control, and relationships to health and disease. Not for microbiology majors. (ND-LABSC)

350, 350L General Microbiology, Lab 3, 1
Principles of microbiology for students requiring a rigorous professionally oriented course. Prereq: BIOL 150, CHEM 121.

352 General Microbiology II 3
Further exploration of microbiological concepts introduced in MICR 350. Topics include molecular structure, physiology, metabolism, growth and microbial genetics. Prereq: MICR 350.

352L General Microbiology Lab II 1
Application of principles of microbiology introduced in General Microbiology II using advanced microbiology techniques and tools. Prereq: MICR 350L. Coreq: MICR 352.

354 Scientific Writing 3
This course will emphasize the qualities of sound logic, good structure, and honesty in writing journal articles and science pieces for popular press. Prereq: ENGL 120, MICR 350, Junior standing.

363 Clinical Parasitology 2
Protozoan, helminthic, and arthropodal parasites of humans. Emphasis on clinical identification, life histories, and control. Prereq: BIOL 150, 150L.

370 Beef Cattle Health Management 1
This course introduces the student to learning through a case-based approach to beef cattle disease. Case material highlights beef cattle health problems seen in the Midwest. Questions encourage students to think about disease prevention, management and eradication. Prereq: ANSC 114 and VETS 135.

371 Dairy Cattle Health Management 1
This course introduces the student to learning through a case-based approach to dairy cattle disease. Case material highlights dairy cattle health problems seen in the Midwest. Questions encourage students to think about disease prevention, management and eradication. Prereq: ANSC 114 and VETS 135.

372 Sheep Health Management 1
This course introduces the student to learning through a case-based approach to sheep disease. Case material highlights sheep health problems seen in the Midwest. Questions encourage students to think about disease prevention, management and eradication. Prereq: ANSC 114 and VETS 135.

374 Swine Health Management 1
This course introduces the student to learning through a case-based approach to swine disease. Case material highlights swine health problems seen in the Midwest. Questions encourage students to think about disease prevention, management and eradication. Prereq: ANSC 114 and VETS 135.

375 Bison Health Management 1
This course introduces the student to learning through a case-based approach to bison disease. Case material highlights bison health problems seen in the Midwest. Questions encourage students to think about disease prevention, management and eradication. Prereq: ANSC 114 and VETS 135.

376 Feline Health Management 1
This course introduces the student to learning through a case-based approach to feline disease. Case material highlights feline health problems seen in the Midwest. Questions encourage students to think about disease prevention, management and eradication. Prereq: ANSC 114 and VETS 135.

377 Canine Health Management 1
This course introduces the student to learning through a case-based approach to canine disease. Case material highlights canine health problems seen in the Midwest. Questions encourage students to think about disease prevention, management and eradication. Prereq: ANSC 114 and VETS 135.

445/645 Animal Cell Culture Techniques 2
Methods of animal cell culture propagation and uses for cell culture systems.

452/652 Microbial Ecology 3
Influence of natural environments on microbial growth. Environmental selection and microbial succession of different species, population interactions, and environmental modification via microbial metabolism. Prereq: MICR 350, 350L.

453/653 Food Microbiology 3
Study of the nature, physiology, and interactions of microorganisms in foods. Introduction to foodborne diseases, effects of food processing on the microflora of foods, principles of food preservation, food spoilage, and foods produced by microorganisms. Prereq: MICR 202L or 350L. Cross-listed with CFS 453/653 and HNES 453.

454/654 Bioprocessing 3
The use of microorganisms and enzymes for processing agricultural materials into industrial products including foods, bio-fuels, and antimicrobials. Prereq: MICR 202L, CHEM 260, or graduate standing. Cross-listed with CFS.

460/660 Pathogenic Microbiology 3
Study of the microorganisms that cause disease and of disease processes. Prereq: MICR 202 or 350L.

460L/660L Pathogenic Microbiology Laboratory 2
Isolation and identification of pathogenic microorganisms. Prereq: MICR 350L.

464/664 Etiology/Foodborne Illness 3
See Food Safety for description.
465/665 Fundamentals of Animal Disease 3

470/670 Basic Immunology 3

471/671 Immunology and Serology Laboratory 2
Basic immunological and serological procedures. Prereq: MICR 350.

474/674 Epidemiology 3
See Food Safety for description.

475/675 Animal Virology 3
The biology of animal viruses with emphasis on virus replication and pathogenesis. Prereq: MICR 350.

480/680 Bacterial Physiology 3

482/682 Bacterial Genetics and Phage 3

486 Capstone Experience in Microbiology 3
Capstone experience to integrate the principles of microbiology with the development of skills in experimental design and scientific discourse. Prereq: Senior standing.

561 Microbiology Laboratory for Pharmacy 1
Students are exposed to laboratory procedures currently used in clinical microbiology laboratories. Prereq: MICR 202, admission to the professional pharmacy program.

572 Clinical Immunology 1
Basic concepts in immunology including special attention to clinical conditions that may appear as a result of immune system activity. Prereq: MICR 202 or 350.

750 Advanced Topics in Epidemiology 3
See Food Safety for description.

752 Advanced Food Microbiology 3
See Food Safety for description.

762 Advanced Pathogenic Bacteriology 3
Biophysical and biochemical mechanisms by which microorganisms cause infectious disease and host reactions to the disease. Prereq: MICR 460. Cross-listed with SAFE.

770 Immunology of Chronic Infections 3
A study of chronic infections, including pathogens involved, mechanisms of host immunity, and economic and social importance of these organisms. Prereq: MICR 470/670.

775 Molecular Virology 3
An in-depth study of current areas of research on human and animal viruses. The replication, pathogenesis, diagnosis, prevention, and control of viruses using contemporary molecular and cellular biology approaches will be examined. Prereq: MICR 460/660, 470/670, 475/675.

781 Advanced Bacterial Physiology 3
In-depth consideration of various topics in bacterial physiology such as autotrophy, bacterial growth and growth yields, energy-yielding metabolism, and regulation of catabolic pathways. Prereq: MICR 480/680.

782 Molecular Microbiological Techniques 3
Familiarize students with current molecular and immunologic strategies and techniques commonly used to study infectious disease processes. Prereq: BIOC 460, 461, 474, MICR 471.

783 Advanced Bacterial Genetics and Phage 3

785 Pathobiology 3
A study of organ systems pathology with attention to pathogenesis of disease and lesion development. Infectious, neoplastic, degenerative and heritable diseases will be discussed. Emphasis is placed on animal disease. Prereq: MICR 460/660.

ARMY ROTC

Oberlander, Chair; Carignan, Edwards, Ewen, Joyce

101 Foundations of Officership 1
Introduce fundamental concepts consistent with the military culture; includes leadership, ethics, and Army values. Increase self-confidence through team study and activities involving military skills, leadership reaction course, and making presentations. Weekly lab required. Coreq: MS 310. F

102 Basic Leadership 1
Principles of effective leading; reinforce self-confidence; develop communication skills to improve performance and group interaction; relate organizational ethical values to leadership effectiveness. Weekly lab required. Coreq: MS 320. S

110 Army ROTC Physical Fitness 2
Instruction in planning and leading physical fitness programs. Development of physical fitness required of an Army officer. Emphasis on development of an individual fitness program and the role of exercise and fitness in one's life. May be repeated. F, S

114 Basic Pistol Marksmanship 1
Fundamentals of military pistol marksmanship techniques, firearms safety, range safety, marksmanship programs, and methods of instruction.

115 Basic Rifle Marksmanship 1
Fundamentals of military rifle marksmanship techniques, firearms safety, range safety, marksmanship programs, and methods of instruction.

201 Individual Leadership Studies 2
Apply ethics-based leadership skills in oral presentations, writing concisely, planning events, coordinating group efforts, first aid skills, land navigation, and basic military tactics. Focuses on personal development and includes ROTC leadership assessment program. Coreq: MS 310. F

202 Leadership and Teamwork 2
Continuation of individual and team building concepts for small unit operations: provides a conceptual framework for decision making, planning, and time management; making safety assessments; introduces movement techniques and pre-execution checks. Coreq: MS 310. S

213 Basic Camp: Camp Challenge 3
A paid six-week summer camp at an Army post. The Army defrays travel, lodging, and most meal expenses. Rigorous environment similar to Army basic training. No military obligation incurred. Application required.

214 United States Military History 2
Overview of all United States military operations with emphasis on technology, leadership, strategy, tactics, and logistics of several selected campaigns.

301 Leadership and Problem Solving 3
Continuation of individual and team building concepts for small unit operations; provides a conceptual framework for decision making, planning, and time management; making safety assessments; introduces movement techniques and pre-execution checks. Coreq: MS 310. S

302 Leadership and Ethics 3
Develop skills in planning and leading by conducting training for lower division students. Introduction to operational art and tactics; includes a series of practical opportunities to lead small groups, receive personal assessments and evaluations. Coreq: MS 310. F

310 Leadership Laboratory 1
Individual and collective drill, small unit leadership experience, and tactical training to lead small groups, receive personal assessments and encouragement, and defensive tactics. Develop skills in planning and leading by conducting training for lower-division students. Weekly lab, physical fitness program, and field exercises required. May be repeated. F

313 Advanced Camp 3
A paid five-week summer camp at an Army post. Highly structured, demanding environment. Emphasis on individual leadership and basic skills performance under challenging conditions. Performance contributes to level of commission upon graduation.

320 Leadership Laboratory 1
Small unit drill, as well as tactical application of leadership fundamentals at the squad/patrol leader level. May be repeated. S

401 Leadership and Management 3
Plan, conduct, and evaluate activities of the ROTC cadet organization. Articulate goals, put plans into action. Introduce staff organization and processes. Assess organizational cohesion and develop improvement strategies. Apply Army policies. Coreq: MS 410.

402 Officership 3
Continuation of planning, conducting, and evaluating activities of the ROTC cadet organization. Articulate goals, put plans into action. Introduce staff organization and processes. Assess organizational cohesion and develop improvement strategies. Apply Army policies. Coreq: MS 420.

410 Leadership Laboratory 1
Assumption of command and staff positions within the cadet battalion. May be repeated. F
MODERN LANGUAGE (LANG)

COURSES

101 Basic ESL: Integrated Skills 1-20
Intensive integrated skills approach to basic English for novice non-native speakers; emphasis on reading, writing, listening and speaking skills needed for academic work. May be repeated. Does not satisfy any requirements for graduation.

104 English for Non-Native Speakers: Vocabulary and Reading 1-5
Intensive instruction in vocabulary and reading skills required for successful completion of university work by speakers of English as a second language (ESL). May be repeated. Does not satisfy any requirements for graduation.

103 ESL Intermediate Grammar and Writing I 1-5
Grammar, usage, syntax, and extensive work with sentence and paragraph structure, stressing unity, and coherence. Emphasis on skills needed for academic work. Does not satisfy any requirements for graduation.

105 ESL Intermediate Grammar/ Writing II 1-5
Extended practice in grammar, usage, syntax, and work with paragraph and essay structure. Emphasis on skills needed for academic work. Does not satisfy any requirements for graduation.

106 English for Non-Native Speakers: Oral Skills 1-5
Intensive instruction in speaking and listening skills required for successful completion of university work by speakers of English as a second language (ESL). May be repeated. Does not satisfy any requirements for graduation.

107 Language Use in Writing for ESL I 1-5
Advanced English grammar forms and essay composition for ESL. Focuses on the production and control of grammatical sentences in written communication, with emphasis on skills needed for academic work. Does not satisfy any requirements for graduation.

108 Roots of American Popular Music (CCN) 3
Survey of American popular music and musicians from Civil War times through the present with an emphasis on historical and sociological influences. Designed for non-music majors. (ND:HUM)

109 Introduction to Music Literature: 1825 to the Present (CCN) 3
Understanding and appreciating musical styles and composers from circa 1825 to the present with some emphasis on the relationship of music to concurrent social and artistic trends. Designed for non-music majors. (ND:HUM)

110 Introduction to Music History (CCN) 3
Introduction to the major works of music in the Western tradition that define the stylistic elements of musical periods in history. (ND:HUM)


115 Pronunciation for Singers II 1

120 Performance Attendance 0
Attendance at regional performances, including NDSU events. Minimum of five registrations necessary for graduation for music majors, two registrations for music minors. P/F only.

131, 132 Survey of Choral Literature 2-4 each
A study of choral literature from Renaissance through the Baroque. Prereqs: MUSC 130 and 231 respectively.

160, 161 Piano Class I, II 1 each
Group instruction in the fundamentals of playing the piano. Designed primarily to meet the basic piano proficiency requirements for music education majors.

162 (CCN), 163 Voice Class I, II 1 each
Group instruction in the fundamentals of singing. For music students who do not major in voice. May be repeated.

164, 165 Practical Work in Composition 1 each
Composers of art music from the early Baroque to the 20th century. Prereq: Qualifying examination in music history.

173, 273 Supplementary Applied Study 1-2 each
For music performance majors. 173 and 273 registrations should be for one credit; add one credit for supplementary pedagogy study. May be repeated.

180 Performance Attendance 0
 Attendance at regional performances, including NDSU events. Minimum of five registrations necessary for graduation for music majors, two registrations for music minors. P/F only.

201 World Music (CCN) 3
Survey of the music cultures of major non-Western and non-Anglo North American ethnic groups of the world. (ND:HUM)

220 Development of Musical Theatre 3
Introduction to Musical Theatre. Lectures provide historical overview. Weekly labs are devoted to active exploration of representative musical theatre repertoire, resulting in a final showcase. Prereqs: THEA 161 and MUSC 162. Cross-listed with THEA 220.

230, 231 Theory and Analysis III, IV 3-6 each
Advanced harmonic and chromatic materials of the common practice period, and analysis and stylistic compositions of music from ancient Greece to contemporary practice. Prereq: MUSC 130, 231 respectively. Coreq: MUSC 232, 233 respectively.

232, 233 Ear Training and Sight Singing III, IV 1 each
Advanced work with ear training and sight singing materials. Laboratory band and chorus required. Coreq: MUSC 230, 232 respectively.

250 Basic Conducting 2
Study and development of basic ensemble conducting skills.

260, 261 Piano Class III, IV 1 each
Intermediate instruction in class piano. Prereq: MUSC 161.

301 Musical Theatre Troupe 1
A select performance ensemble of musical theatre performers. This ensemble meets twice a week to develop scenes, songs, and choreography for classic and contemporary musical theatre repertoire. May be repeated. Prereq: selection by audition only.

311 Instrumental Arranging 2
Arranging materials for bands. Prereq: MUSC 231.

312 Survey of Choral Literature 2
A study of choral literature from Renaissance through the 21st century. Prereq: MUSC 340.

340 Music History I 3
Study of the history of music from the Greek period through the Baroque. Prereq: MUSC 103.

341 Music History II 3
Study of the history of music from the Classical period through the 20th century. Prereq: MUSC 340.
344 Wind Band Literature
See department for description.

346 Survey of Vocal Literature
An overview of local literature from 1600 to present. Representative works will include literature from the Western tradition.

347 Piano Pedagogy I
Methods and materials for teaching beginning and early-grade piano students. Prereq: Music majors or minors.

348 Piano Pedagogy II
Methods and materials for teaching intermediate and advanced-level piano students. Prereq: Music majors or minors.

349 [150] Vocal Methods and Pedagogy I
Instruction in vocal pedagogy and methods for music majors.

350 Vocal Methods and Pedagogy II
Advanced instruction in vocal pedagogy and methods for music education majors. Prereq: MUSC 349.

351 Instrumental Conducting and Literature
Fundamentals and techniques of conducting instrumental ensembles with practical application through the study of instrumental literature.

352 Choral Conducting and Literature
Fundamentals and techniques of conducting choral ensembles with practical application through the study of choral literature.

353 Woodwind Methods I
Class instruction in woodwind instruments for vocal and instrumental music education majors. Emphasis on pedagogical principles, applied competency of fundamentals, and literature.

354 Woodwind Methods II
Class instruction in woodwind instruments for instrumental music education majors. Emphasis on advanced pedagogical principles, applied competency of fundamentals and in-depth coverage of literature.

355 Brass Methods
Class instruction in brass instruments for vocal and instrumental music education majors. Emphasis on pedagogical principles, applied competency of fundamentals, and literature.

357 Marching Band Methods and Techniques
Methods and materials for directing, charting, and fielding a high school marching band.

358 Jazz Methods
History, methods, and materials for teaching jazz styles and improvisation.

359 Percussion Methods
Class instruction in percussion instruments for music education majors. Emphasis on pedagogical principles, applied competency, and literature.

364 Jazz Improvisation
Basic concepts necessary to play and teach the fundamentals of jazz improvisation. May be repeated.

373 Supplementary Applied Study
For music performance majors. Typical registration should be for two credits; add one credit for supplementary pedagogy study. May be repeated.

380 Recital
Preparation and presentation of a half recital in instrumental, keyboard, or vocal performance. May be repeated.

384 Composition I
This course will serve as an introduction to compositional techniques. Group and private instruction will be given during the semester. Prereq: MUSC 231.

411/611 Form and Analysis
Study of the types of tonal relationships that create musical works of art. Examination of small forms such as motive and phrase, and progressing to large forms such as fugue, variation, and sonata.

430/630 Counterpoint
Study of contrapuntal techniques of the Renaissance and Baroque periods through analysis and composition exercises. Prereq: MUSC 231.

431/631 Contemporary Harmonic Techniques
Study of harmonic and contrapuntal techniques of contemporary composers, with exercises in writing in the various styles. Prereq: MUSC 231.

441/641 [141] Symphonic Literature
Survey of the history of symphonic literature with emphasis on selected works. Prereq: Permission of instructor.

442/642 [142] Operatic Literature
Survey of the history of opera with emphasis on selected works. Prereq: MUSC 340 and MUSC 341 or consent of instructor.

443/643 [143] Keyboard Literature
Survey of keyboard styles, instrumental development, and literature (excluding organ) from the early 14th century through the 20th century, with special emphasis on works from 1775 to 1925. Prereq: Permission of instructor.

473 Supplementary Applied Study
For music performance majors. Typical registration should be for three credits; add one credit for supplementary pedagogy study. May be repeated.

480 Recital
Capstone for performance majors. May be repeated.

484 Composition II
This course will continue study of compositional techniques and will require finished compositions for performances. Group and private instruction will be given during the semester. Prereq: MUSC 231 and MUSC 384.

701 Psychology of Music
Study of acoustics, the anatomy and physiology of hearing, and how the listener perceives music and sound.

702 Graduate Theory Survey
Class is structured as a theory review course for entering graduate students. It will enable students to be able to do advanced course work in analytical studies and other technical graduate courses.

703 Foundations of Music Education
This course is designed to provide a comprehensive view of the basic foundations inherent in the study of music education at the graduate level, with the emphasis on the development of a personal philosophical perspective that accounts for historical, philosophical, practical and sociological perspectives. Prereq: admission to the Master of Music program.

709 Graduate Ensemble
Ensemble registration for graduate students. Study and performance of major works of each ensemble. May be repeated.

721 Advanced Vocal Pedagogy and Repertoire
In-depth study of the physical and physiological considerations of vocal technique with application to specific voices and suitable repertoire. May be repeated.

722 Advanced Instrumental Music Pedagogy and Literature
Advanced study in the pedagogy and literature of wind instruments. Emphasis on techniques of teaching winds in grades 5 through 12. Section 1: Brass pedagogy. Section 2: Woodwind pedagogy. May be repeated.

731 Applied Study
Private applied music study (instrumental, keyboard, vocal, conducting). Course credit determined by program and recommendation of instructor. May be repeated.

734 Analytical Techniques
Analysis of music of all periods, using a variety of techniques. Music to be analyzed will vary with each offering; may be repeated with permission of instructor. May be repeated.

740 Medieval and Renaissance Music History
In-depth historical study of Medieval and Renaissance musical styles and genres through critical listening, discussions, and student and instructor presentations.

741 Baroque Music History
In-depth historical study of Baroque musical styles and genres through critical listening, discussions, and student and instructor presentations.

742 Classical Music History
In-depth historical study of Classical musical styles and genres through critical listening, discussions, and student and instructor presentations.

743 Romantic Music History
In-depth historical study of Romantic musical styles and genres through critical listening, discussions, and student and instructor presentations.

744 20th Century Music History
In-depth study of the 20th century musical language and compositional values and goals through critical listening, score analysis, discussions, and student and instructor presentations.

748 Music Bibliography and Research Methods
Introduction to music reference works, general music bibliography, and research methods.

760 Medieval/Renaissance Choral Literature
A study of choral literature of the Medieval and Renaissance periods, including major composers, genres, forms, and compositional styles.
Course Descriptions

761 Baroque Choral Literature 3
A study of choral literature of the Baroque period, including major composers, genres, forms and compositional styles.

762 Classical/Romantic Choral Literature 3
A study of choral literature of the Classical and Romantic periods, including major composers, genres, forms and compositional styles.

763 Contemporary Choral Literature 3
A study of choral literature of the 20th and 21st centuries, including major composers, genres, forms and compositional styles.

765 Band Literature: History and Development 3
Historical survey of instrumental literature for wind band, covering repertoire from the Renaissance to the present.

766 Band Literature: Chamber Music, Other Genres 3
Survey of instrumental literature for wind band, covering music for young bands, wind band and voice, wind band and solo instruments, chamber music, and other genres.

767 Vocal Literature I: Baroque and Classical 3
Performance and research-based study of the vocal literature of the Baroque and Classical eras, including national trends and performance practice.

768 Vocal Literature II: Romantic 3
Performance and research-based study of the vocal literature of the Romantic era (1800-1915), including national trends and performance practice.

769 Vocal Literature III: 20th Century and Contemporary 3
Performance and research-based study of the vocal literature from 1915 to present, including national trends and performance practice.

808 Recital 1
Preparation and presentation of a professional full-length recital in instrument, keyboard, vocal, or conducting performance, with accompanying documentation. May be repeated.

111 Marching Band 1
112 Varsity Band (ND:FA) 1
114 University Summer Band 1
115 University Chorus (ND:FA) 1
116 Cantus
117 Statesmen of NDSU
302 Wind Ensemble
303 Concert Band (ND:FA)
304 University Symphony Orchestra
306 Concert Choir (ND:FA)
311 Jazz Ensemble
312 Percussion Ensemble
313 Trombone Ensemble
314 Brass Chamber Ensemble
315 Woodwind Chamber Ensemble
316 String Chamber Ensemble
317 Madrigal Singers
318 Dakota Jazz (Vocal)
319 Opera Workshop
320 Vocal Chamber Ensemble
321 Piano Chamber Music
322 Jazz Combo

NATURAL RESOURCES MANAGEMENT (NRM)
Asworth, Barker, Biondini, Bleier, Casey, Clambey, Goreham, Grygiel, Kirby, J. Leitch, Meister, Norlard, Padmanabhan, Steele, Zeleznik

225 Natural Resource and Agro-ecosystems (CCN) 3
Introduction to scientific theories and their relation to natural resources and agriculture. Influence of these theories on current perspectives toward the environment. 3 lectures. Cross-listed with RNG. (ND:SCI)

264 Natural Resource Management Systems 3
See Agricultural Systems Management for description.

431/631 [731] NEPA and Environmental Impact Assessment 2
The interaction and effects of the National Environmental Policy Act (NEPA) with national environmental policy; implementation of the NEPA; public opinion on the state of the environment.

432/632 [732] Environmental Impact Statement 2
A comprehensive overview of the Environmental Impact Statement (EIS) planning process, document preparation, and project management.

453/653 Rangeland Resources Watershed Management 3
See Range Science for description.

454/654 Wetland Resources Management 3
Principles of wetland systems, wetland management, wetland functions, wetland assessment, and wetland improvement. Prereq: RNG 336. Cross-listed with RNG.

701 Terrestrial Resources Management 3
Management and ecology of heterogeneous landscapes where ecosystem processes and human activities interact as dynamic components. Prereq: RNG/BOT 660.

702 Natural Resources Management Planning 3
Presentation of the principles, practices and key policy issues of natural resources management and planning.

720 Natural Resources Administration and Policy 2
A comprehensive analysis of the theory of externalities and their application to the design of natural resource policy. Prereq: ECON 681, NRM 702.

730 Environmental Law 1
Overview of the subject of environmental law.

NURSING (NURS)
Wright, Chair; Fisher, Greenwald, C. Gross, D. Gross, Haug, Kiser-Larson, Lee, Lundeen, McCullagh, Miller, Stenson, Thompson

COURSES
240 Nursing as a Scholarly Profession 3
Introduction to the practice of professional nursing. The course focuses on the philosophy of the nursing program, the nature of the nursing profession and utilization of the scientific process. Prereq: Admission to program.

250 Health Promotion 2
Introduction to community as client and setting for nursing practice. Focus on theory and methods of health promotion and teaching-learning. Introduction to providing culturally-sensitive care. Prereq: Admission to program.

251 Skills and Concepts for Nursing 2
Introduction to the nursing process, basic nursing skills and clinical decision-making. Prereq: NURS 240, 250 and admission to program.

252 Gerontologic Nursing 2
This course focuses on health, the deviations of health, and the nursing care of the geriatric population. Prereq: NURS 240, 250 and admission to program.

340 Leadership and Ethical Reflection 2
This course presents principles of leadership in the nursing profession and in civic life. The role of ethical reflection as an essential component of professional practice is discussed. Prereq: second year level nursing courses and admission to program.

341 Foundations of Clinical Nursing 3
This course emphasizes the physiologic, psychologic, and pathophysiologic concepts that provide the foundation for professional nursing care. Prereq: second year level nursing courses and admission to program.

342 Adult Health Nursing I 5
This course emphasizes the pathophysiology and the nursing care of adult clients experiencing common disorders of body systems. 3 credits didactic, 2 credits clinical. Prereq: second year level nursing courses and admission to program.

343 Professional Nursing Theories and Concepts 2
In this course the licensed practical nurse begins study of the professional nursing role. The course focuses on the philosophy of the nursing program and the nature of the nursing profession. Prereq: Licensure as a practical nurse.

352 Family Nursing I 5
This course focuses on nursing care and health promotion for the childbearing family. Includes identification and care of high-risk clients. 3 credits didactic, 2 credits clinical. Prereq: second year level nursing courses and admission to program.

360 Health Assessment 4
Focuses on health assessment and health promotion of individual clients through utilization of the nursing process and basic nursing concepts. Prereq: Admission to program.

362 Family Nursing II 4
Focuses on nursing care of the child and family as client. Includes infancy through adolescence, hospitalized and within the community, acutely ill and chronically ill; common stressors throughout the growing years;
strategies for health promotion. 3 credits didactic, 1 credit clinical. Prereq: second year level nursing courses, NURS 340, 341, 342, PHRM 300 and admission to program.

372 Integrated Family Nursing 2
Provides the student opportunity to integrate prior learning about pediatric and obstetrical care with an increased knowledge of family dynamics and cultural influences. Prereq: RN or LPN licensure, admission to program.

402 Mental Health Nursing 5
Synthesis and application of nursing and psychiatric-mental health concepts to promote the wellness of individuals and groups. 3 credits didactic, 2 credits clinical. Prereq: second year level nursing courses, NURS 340, 341, 342, PHRM 300 and admission to program.

403 Adult Health Nursing II 5
Focuses on the etiology, pathophysiology, and nursing care of adult clients experiencing selected clinical problems originating from respiratory and cardiovascular systems, neuro trauma, and multisystem problems. Care of families of clients is also emphasized. 3 credits didactic, 2 credits clinical. Prereq: second year level nursing courses, NURS 340, 341, 342, PHRM 300 and admission to program.

404 Adult Health III 4
The pathophysiologic mechanisms and organization of nursing care of adult clients experiencing selected complex stressors. 2 credits didactic, 2 credits clinical. Prereq: second and third year level nursing courses, NURS 402, 403, 440 and admission to program.

405 Psychosocial Nursing 2
In this course the student will synthesize prior learning with further exploration of psychosocial nursing. Prereq: RN or LPN licensure, admission to program.

406 Public Health Nursing 4
The focus of this course will include the core functions of public health, partnering with the community, primary prevention, creation of healthy environments, service to those at risk, stewardship of resources, and multidisciplinary collaboration. 3 credits didactic, 1 credit clinical. Prereq: second and third year level nursing courses, NURS 402, 403, 440 and admission to program.

407 Adult Health: Complex Problems 5
Designed for persons with a nursing license, this course focuses on the etiology, pathophysiologic mechanisms, and organization of nursing care for adult clients experiencing selected complex stressors. Prereq: NURS 240 or 360.

430 Nursing Management 2
Study of concepts and issues related to management and leadership in professional nursing. Prereq: NURS 340, 341, 342 and admission to program.

440 Nursing Issues/Career 2
This course presents an overview of contemporary nursing issues and a guide for career development. Prereq: NURS 340.

450 Nursing Synthesis and Practicum 4
NURS 450 is the capstone course in the nursing major and provides a framework for the student's transition to the entry-level professional role. 1 credit didactic, 3 credits clinical. Prereq: second, third and other fourth year level nursing courses and admission to program.

601 Theoretical Perspectives of the Discipline 2
The course is designed to help the student analyze, critique and apply a variety of nursing theories, models and conceptual frameworks in advanced nursing practice.

602 Ethics of Health Care and Nursing 2
The course provides the graduate nursing student with opportunities to analyze interactions among common clinical, organizational, societal, and policy decisions from ethical and legal perspectives.

604 Advanced Nursing Research 2
Research in nursing includes an exploration of the research process and the methodologies appropriate to nursing.

605 Health Care Delivery Systems Policy and Financing 2
Focus on health care delivery systems configuration, policy development and how health care systems are financed.

606 Transcultural and Social Perspectives 3
Develop understanding of diversities in races, cultures, individuals, families, communities, populations, lifestyles, gender, and age groups. Changing demographics will be analyzed, major health needs identified, and health promotion and disease prevention plans formulated.

612 Advanced Health Assessment 3
Performance of health histories, complete physical/psychosocial assessments, and developmental assessments of clients from across the lifespan. A laboratory component is included.

612P Practicum I: Advanced Health Assessment 3
Clinical opportunities for application of recently learned skills and extended clinical experiences in advanced health assessment. Clinicals are supervised by a health care provider who has documented expertise in the area of specialization. Prereq: NURS 612

614 Advanced Pathophysiology I 2
General pathophysiologic responses to selected body systems to disease processes are presented from both biological and behavioral perspectives. Emphasis on normal cellular function, developmental changes and common physiological symptoms.

616 Advanced Pathophysiology II 2
Builds on the context from NURS 614 with emphasis on normal cellular function, developmental changes and common physiological symptoms. Synergistic clinical manifestations and total body-mind responses to systemic alterations. Prereq: NURS 614.

618 Family Nursing Theory and Health Promotion 3
Theoretical foundations and research based interventions related to psychosocial effects of illness, health behaviors, health promotion and disease prevention. Critically examines patterns of health behaviors, influence of psychosocial issues, risk assessment, lifestyles, and developmental stages.

620 Advanced Practice Roles 2
Focus on the advanced practice nurse's role expectations. Includes an understanding of the profession, regulations and rules of advanced practice, scope of practice, legal ramifications of scope of practice, interdisciplinary, collaborative practice. Prereq: NURS 634P, 641P.

620P Practicum IV: FNP Role Integration 2
Clinical focus on the advanced practice nurse's role expectations in the primary care setting. Includes an understanding of the profession, regulations and rules of advanced practice, scope of practice, legal ramifications of scope of practice, interdisciplinary, collaborative practice. Prereq: NURS 634P, 641P.

621 Integrative Health Practices 3
Integrative therapies with a focus on selected systems of health and specific modalities widely used by health care consumers. Emphasis on assessing patients for use and developing a list of educational and provider resources.

623 The Nurse as Educator 4
Major study in selected area with an emphasis in research. Prereq: NURS 632.

624 Advanced Transcultural Nursing 3
Program planning to promote the health of diverse populations will be based on epidemiological data, theory and research. Students will select a specific age group or health problem within a population/cultural group to study in depth. Prereq: NURS 608.

625 Advanced Parish Nursing 3
Emphasis is placed on the mind-body-soul connection with health and healing. Strategies for designing, implementing and evaluating a parish nurse program, along with administrative implications are explored. Prereq: NURS 616, 618.

626 Ethical Considerations of Parish Nursing 3
Ethical and legal considerations unique to an advanced parish nursing practice are evaluated and protocols recommended. Theoretical applications, research findings, and policy and legal principles are utilized. Parameters of advanced nursing practice in parish settings will be delineated. Prereq: NURS 602.

630 Advanced Community Assessment 3
Epidemiological techniques, reporting, and research will be presented. Emphasis is placed on disease prevention and control. Health problems of national and international significance will be examined and strategies for solutions and/or management will be proposed. Prereq: STAT 330.

631 Advanced Pharmacology I 2
Information relative to therapeutic management guidelines for treatment of selected disease processes. Drug information by classification and basic principles of pharmacodynamics and pharmacokinetics, clinical uses, mechanisms of action, contraindications, adverse reactions, and client education implications.

632 Advanced Pharmacology II 2
Continuation of information relative to therapeutic management guidelines for treatment of selected disease processes. Drug information by classification and basic principles of pharmacodynamics and pharmacokinetics, clinical uses, mechanisms of action, contraindications, adverse reactions, and client education implications. Prereq: NURS 631.

633 Family Primary Care I: Assessment and Management 3
Clinical decision making skills are fostered in the diagnosis, management, monitoring and evaluation of common acute, emergent, and chronic health conditions. Selected case studies of clients will be examined in relation to problems, diagnoses, plans, and evaluations. Prereq: NURS 612P, 616.
633P Practicum II: Family Primary Care I 4
Clinical opportunities for application of recently learned skills and extended clinical experiences in advanced health assessment. Theory, research and didactic learning experiences are incorporated and supervised by a health care provider with expertise in the area of specialization. Prereq: NURS 631, 633.

634 Family Primary Care II: Assessment and Management 3
Clinical decision making skills are fostered in the diagnosis, management, monitoring and evaluation of common acute, emergent, and chronic health conditions. Selected case studies of clients will be examined in relation to problems, diagnoses, plans, and evaluations. Prereq: NURS 633.

634P Practicum III: Family Primary Care II 4
Clinical opportunities for application of clinical experiences in advanced health assessment. Theory, research and didactic learning experiences are incorporated in the student practice and supervised by a health care provider with expertise in the area of specialization. Prereq: NURS 632, 634.

640 Adult Nursing I 3
Evaluation and synthesis of advanced pathophysiology concepts applied to nursing and health related theories, and research related to client outcomes. Health and illness phenomena, symptom management, and nursing interventions will be reviewed. Prereq: NURS 612, 616.

640P Advanced Nursing Practicum I 3-6
Clinical opportunities for application of clinical experiences in a primary care setting. Theory, research and didactic learning experiences are incorporated in the students practice and supervised by a health care provider with expertise in the area of specialization. Prereq: NURS 640.

641 Adult Nursing II 3
Continuation of Adult Nursing I. Emphasis on clinical decision-making, teaching/learning theory and formulation of researchable questions for advanced nursing practice as an adult CNS. Prereq: NURS 640.

641P Advanced Nursing Practicum II 3-6
An extended practicum time allowing the student a chance to more fully integrate skills and knowledge learned through the graduate program. Emphasis will continue on consultation, program planning, education, health promotion, and prevention of disease/illness. Prereq: NURS 641.

710 Health Promotion and Disease Prevention 2
Critically examines patterns of health behaviors, risk assessment, lifestyles, developmental stages, sociocultural, psychological, and spiritual contributions to well-being. Includes data-based assessment and management of preventive health services and common acute and chronic conditions. Prereq: Graduate standing.

712P Assessment Practicum 6
In this course the student integrates health history, physical examination and laboratory evaluations in a plan for management of client needs. Prereq: NURS 612.

720 Advanced Practice Roles 2

730 Clinical Applications 3
Student designs individualized study in an area of focus. Options include extension of a scholarly study, extended clinical practice, intensive study of specialized treatment modality and other appropriate foci. Prereq: NURS 634.

733P FPC: Residency I 8
Student synthesizes skills acquired in previous didactic and clinical courses to provide diagnosis, treatment, and management of an increasingly varied group of clients. Prereq: NURS 633.

734P FPC: Residency II 8
Student synthesizes skills acquired in previous didactic and clinical courses, in particular NURS 733P, to provide diagnosis, treatment, and management of an increasingly varied group of clients. Prereq: NURS 634, 733P.

735P Role Integration 8
Focus is on the role of the advanced practice nurse in the primary care setting. Prereq: NURS 733P.

PEACE AND CONFLICT STUDIES (PS)

Littlefield

COURSE

201 Introduction to Peace and Conflict Studies 3
Interdisciplinary exploration of the roots of violence and non-violence, making use of socio-political, historical, psychological, biological, and spiritual perspectives.

PHARMACEUTICAL SCIENCES (PSCI)

Singh, Chair; Balaz, Chatterjee, Guo, Law, Mallik, O’Rourke, Qian, Schnell, Sheng, Sun

COURSES

340 Pathophysiology I 4
Comprehensive study of the normal and abnormal physiological processes and the mechanisms important to the understanding of pharmacology and drug therapy. Prereq: BIOL 220, 220L, 221, 221L.

341 Pathophysiology II 4
Normal and abnormal physiological processes and the mechanisms important to the understanding of pharmacology and drug therapy. Prereq: PSCI 340.

368, 369 Pharmaceutics I, II 4,3
Quantitative and theoretical principles of science applied to the design, preparation, evaluation, use, and therapeutic limitations of various pharmaceutical dosage forms. Biological and physiochemical principles that govern the absorption, distribution, metabolism, and excretion of drug dosage forms in humans. Prereq: Admission to professional program.

409/609 Isotope Tracer Techniques 3
Theory and techniques for the use of radioactive and stable isotopes in research.

411/611 Pharmacodynamics and Applied Therapeutics I 3
Basic chemical and pharmacological principles applied to the study of therapeutic agents; pharmacologic and therapeutic properties of drugs that affect the autonomic nervous system. Prereq: BIOC 460, PSCI 340.

412/612 Pharmacodynamics and Applied Therapeutics II 3
Pharmacologic and therapeutic properties of chemotherapeutic agents, anti-infectives, and drugs that affect the endocrine system. Prereq: PSCI 341, 411, BIOC 461.

413/613 Pharmacodynamics and Applied Therapeutics III 3
The pharmacological properties of therapeutic agents used in the treatment of the autonomic nervous system and endocrine system. Prereq: PSCI 341, 411, BIOC 461.

414/614 Pharmacodynamics and Applied Therapeutics IV 3
Pharmacologic and therapeutic properties of drugs that affect the cardiovascular, respiratory, and renal systems. Prereq: PSCI 413.

415/615 Pharmacodynamics and Applied Therapeutics V 3
Pharmacologic and therapeutic properties of drugs that affect the gastrointestinal and genitourinary tracts, integumentary/connective tissues, and the central nervous system. Prereq: PSCI 411.

416/616 Pharmacodynamics and Applied Therapeutics VI 3
The pharmacological properties of therapeutic agents used in the treatment of central nervous system disorders. Prereq: PSCI 341, 411, BIOC 461.

443/643 Toxicology 2
Poisons, their mode of action, detoxification, and treatment. Prereq: PSCI 412.

470/670 Pharmaceutics III: Pharmacokinetics 3
Concepts and mathematical techniques for describing the time course of drugs in biological systems.

545 Clinical Toxicology 2
Toxic potential of various poisonous substances including mechanism of toxicity, toxic doses, clinical presentation, clinical and laboratory monitoring and their specific treatment.

701 Quantitative Drug Design 2
Modeling of drug disposition and receptor binding with focus on rational development of new drugs and elucidation of action mechanisms.

703 Drug Metabolism 2
Drug biotransformations and their effects on drug properties such as duration of action, potency, toxicity, and specificity. Prereq: BIOC 702.

718 Techniques in Pharmaceutical Research 3
Application of modern instrumental techniques in the pharmaceutical sciences; qualitative and quantitative determination of physiologically and pharmacologically important substance.

746 Neuropharmacology 3
Study of action mechanisms of drugs affecting the central and peripheral nervous systems.

747 Cardiovascular Pharmacology 3
Study of action mechanisms of drugs affecting the circulatory systems, including their pathology.
PHARMACY PRACTICE (PHRM)

Miller, Chair; Albano, Biberdorf, Brown, R. Clarenes, Dewey, Drummond, Fitz, Focken, Frenzel, Friesner, Halbs, Khach, Naughton, R. Nelson, Otvig, Otte, Patnaude, Roden, Schmitt, Scott, Strandberg, Sylvester, Welch, Werneyer, Wilhelm

PHARMACOLOGY (PHRM)

A systematic study of building medical terms and understanding their relationship to human anatomy and physiology, pathology and medical treatment. Restricted to pre-CLS, pre-RC, pre-RS, pre-Nursing, pre-Pharmacy and Pharmacy majors only.

125 Medical Terminology for Health Professionals 1

Sample cases and dispensing activities are incorporated into the Concept Pharmacy Lab. Prereq: PHRM 352, 352L. Coreq: PHRM 451L.

170 Common Medicines and Diseases 2

Consumer-oriented introduction to drugs, common dosage forms, usage of common classes of prescription, and over-the-counter drug products. Does not count toward a pharmacy major.

200 Principles of Clinical Pharmacology 3

Principles of pharmacology and therapeutics for nursing and other non-pharmacy health professions. Does not count toward a pharmacy major.

351 Pharmaceutical Care I 1

The first in a six course series, this course is designed to introduce pharmaceutical care and teach pharmacy students about health care systems, drug literature sources, and a medical record. Coreq: PHRM 351L.

352 Pharmaceutical Care II 1

Continuation of the pharmaceutical care series, students will learn to develop a pharmaceutical care plan, interpret lab values, and discuss health care systems. Prereq: PHRM 351, 351L. Coreq: PHRM 352L.

352L Introductory Pharmacy Practice Experience I 1

The introductory pharmacy practice experiences involve actual practice experiences in community and institutional settings and permits students, under supervision and as permitted by practice regulations, to assume direct patient care. Prereq: PHRM 352, 352L. Coreq: PHRM 451.

451L Introductory Pharmacy Practice Experience II 1

Coursework will assist Doctor of Pharmacy candidates to develop competence in recognizing, analyzing, and resolving drug related problems; providing accurate drug information and education; promoting public health and managing a patient oriented pharmacy practice. Prereq: PHRM 352, 352L. Coreq: PHRM 451.

452 Pharmaceutical Care IV 1

The fourth course introduces students to management techniques applicable to the contemporary practice of pharmacy in community and institutional settings. Prereq: PHRM 451, 451L. Coreq: PHRM 452L.

461 Intro to Pharmaceutical Industry 2

Introduction to understanding the working environment of the traditional pharmaceutical industry, concentrating on major business and research divisions and the role that each division plays in the drug development process. Prereq: P2 student.

462 Stress Management for Health Professionals 1

This course for health care professionals will focus on healthy coping skills and self-care techniques for stress reduction and relaxation, not only in their professional lives, but also in providing patient care. Prereq: Pharmacy or Nursing major.

463 Current Issues in Hospital Pharmacy 2

This course will provide students with a working knowledge of issues and requirements faced by hospital pharmacists and the managerial techniques and practice standards utilized in meeting them. Prereq: P2 student.

464 Current Concepts in Pharmacy Practice 2

An evaluation of current issues in pharmacy practice and an introduction to design of a research proposal and completion of IRB requirements. Prereq: P2 student.

465 Cultural Competence in Pharmacy Practice 3

The purpose of this course is to provide education and skill building that will enable pharmacy students to effectively utilize cultural and linguistic competence as a key tool to improve health outcomes for diverse populations. Prereq: Admission to professional program.

471 Clinical Pharmacokinetics 2

Discussion of multiple dosing, determination of dosage regimens, and factors influencing these; drug monitoring, clinical pharmacokinetics of various drug groups. Prereq: PSCI 470.

475 Pharmacy Practice Management 3

This course introduces students to management techniques applicable to the contemporary practice of pharmacy in community and institutional settings. Prereq: Admission to professional program.

480 Drug Literature Evaluation 3

Survey of clinical drug literature sources and evaluation of the original literature. Prereq: Admission to professional program.

485/685 Economic Outcomes Assessment 2

The use of pharmacoeconomic analysis and outcomes assessment as applied to health care. Prereq: PHRM 480 or Doctor of Nursing or MBA standing.

520 PTDI: Pediatrics-Geriatrics 2

Focused on providing pharmaceutical care for patients from prenatal period to geriatric years. Specific therapy common to the very young or very old. Prereq: Bachelor of Science in Pharmaceutical Sciences.

532 PTDI: Infectious Disease 3


534 PTDI: Rheumatology, Endocrine, and Reproduction 2

Pathophysiology, diagnostic evaluation, and therapeutic approach to major rheumatology disorders (bones, joints, and musculoskeletal disorders); endocrine disorders (diabetes, mellitus, thyroid, adrenal, and endocrine-based gynecological disorders) and contraceptive pharmacotherapy. Prereq: BS in Pharmaceutical Sciences.

535 PTDI: Neoplastic Diseases 3

In-depth study of the pathophysiology, pharmacotherapy and diagnostic evaluation of major neoplastic diseases. Prereq: BS in Pharmaceutical Sciences.

536 PTDI: Neurology and Psychiatry 3

Pathophysiology and pharmacotherapy of the major neurologic and psychiatric disorders. Prereq: BS in Pharmaceutical Sciences.

537 PTDI: Renal Disease/Fluid and Electrolytes 3

This course focuses on the pathophysiology and pharmacotherapy of major renal diseases including fluid and electrolyte disorders. Emphasis is placed upon application of knowledge to patient care situations and the mastery of pharmacotherapy. Prereq: BS in Pharmaceutical Sciences.

538 PTDI: Cardiovascular and Pulmonary Diseases 4


551 Pharmaceutical Care V 1

The fifth in a six-semester sequence, this course focuses on skills necessary to provide advanced pharmacy services. Sample cases, telepharmacy, and supervision of dispensing functions are incorporated into the Concept Pharmacy. Prereq: BS in Pharmaceutical Sciences. Coreq: PHRM 551L.

551L Pharmaceutical Care Laboratory III 1

Coursework will assist Doctor of Pharmacy candidates to develop competence in recognizing, analyzing, and resolving drug related problems; providing accurate drug information and education; promoting public health and managing a patient oriented pharmacy practice. Prereq: BS in Pharmaceutical Sciences. Coreq: PHRM 551.

555 Pharmaceutical Care VI 1

The sixth in a six-semester sequence, this course focuses on skills necessary to provide advanced pharmacy services. Sample cases, service learning, and use of diagnostic tests will be incorporated into the Concept Pharmacy laboratory. Prereq: PHRM 551, 551L. Coreq: PHRM 552L.
521 Introduction to Philosophy (CCN) 3
Basic problems, concepts, and methods of philosophy. (ND:HUM)

322 Medieval Philosophy
Western philosophy from St. Augustine to Ockham and Marsilius of Padua.

323 Modern Philosophy
Western philosophy from Descartes to Kant.

356 Ancient Philosophy
See Humanities for description.

357 Augustine
Study of Augustine’s thought, especially philosophical, in its historical context.

369 Philosophy of Religion
See Humanities for description.

476 History of Philosophy: Modern Period
See Humanities for description.

481/681 Philosophy of Science
Philosophical aspects of science.

486 Philosophy and Literature
See Humanities for description.

487 Aesthetics
See Humanities for description.

PHYSICS (PHYS)
Kroll, Head; Denton, Ihle, Kryjerskaia, Kryjerski, May, Pilling, Sawicki, Swenson, Wagner

101 Introduction to Physics (CCN) 3
Lecture and laboratory introduction to physics. Prereq: MA TH 165.

110, 110L Introductory Astronomy, Lab (CCN) 3.1
Qualitative survey of the current understanding of the universe including planetary explorations, solar phenomena, stars, black holes, nebulae, galaxies. (ND:LABSC)

120, 120L Fundamentals of Physics, Lab (CCN) 3.1
Application of physics concepts and principles to the real world. Topics selected from mechanics, heat, optics, electricity, and magnetism. (ND:LABSC)

211, 211L College Physics I, Lab (CCN) 3.1
Beginning course for students without a calculus background. Includes basic principles of bodies at rest and in motion, fluids, vibrations, waves, and sound. Prereq: MATH 105. (ND:LABSC)

212, 212L College Physics II, Lab (CCN) 3.1
Second course for students without a calculus background. Includes optics, electricity, magnetism, and thermodynamics. Prereq: PHYS 211, 211L. (ND:LABSC)

215 Research for Undergraduates 1-3
Special research studies in physics under the supervision of an instructor.

251, 251L University Physics I, Lab (CCN) 4.1
Newtonian mechanics of translational and rotational motion, work, energy, power, momentum, conservation of energy and momentum, periodic motion, waves, sound, heat, and thermodynamics. Prereq: MATH 165.

251R University Physics I Recitation 1
A recitation that complements PHYS 251 with theory and applications. Coreq: PHYS 251.

252, 252L University Physics II, Lab (CCN) 4.1
Electric charge, field, potential, and current; magnetic field; capacitance; resistance; inductance; RC, RL, LC and RLC circuits; EM waves; optics. Prereq: PHYS 251, 251L. Coreq: MATH 166.

252R University Physics II Recitation 1
A recitation that complements PHYS 252 with emphasis on theory and applications. Coreq: PHYS 251. Coreq: PHYS 252.

350 Modern Physics

351, 352 Mechanics I, II 3 each
Rigid bodies and systems of particles analyzed with Lagrangians, Hamiltonians, and methods from Vector Calculus; gravitation; central field problems; wave motion; fluid dynamics. Prereq for 351: PHYS 252, MATH 266. For 352: PHYS 351.

361 Electromagnetic Theory
Electrostatics, magnetostatics, dielectrics, electric circuits, time varying electric and magnetic fields, electromagnetic induction, physical content, and application of Maxwell’s Equations. Prereq: PHYS 252, MATH 266.

370 Introduction to Computational Physics
Introduction to computational methods, with applications involving planetary motion, numerical integration, chaotic oscillations, percolation, random walks, diffusion limited aggregation, and Fourier transforms. 2 lectures, 2 one-hour laboratories. Prereq: PHYS 251, MATH 166.

411/611 Optics for Scientists and Engineers

411L/611L Optics for Scientists and Engineers Laboratory 1
Required laboratory for PHYS/ECE 411/611. Ten optics experiments plus a major related optics project. Prereq: PHYS 252. Coreq: PHYS 411L/611L. Cross-listed with ECE.

413/613 Lasers for Scientists and Engineers 3
Lecture and laboratory introduction to lasers. Spontaneous and stimulated transitions, line-broadening, gain, gain saturation, optical resonators, Fabry-Perot interferometers, theory of laser oscillation, rate equations, transverse modes, coherence, and Gaussian beams. Prereq: PHYS 252.
415/615 Elements of Photonics 3 Analysis of optical systems using the matrix formulation, wave propagation in anisotropic media, electro-optic effect and laser modulation, physical origin of optical non-linearities, phase matching, optical second harmonic and parametric generation. Prereq: PHYS 252.


471 Advanced Physics Laboratory 2 Advanced laboratory in modern physics and computer simulation of experiments: experiments such as electron diffraction, nuclear spectroscopy, photoelectric effect are performed. Data analysis and fitting of solutions of differential equations to experiments using Mathcad. Prereq: MATH 266, PHYS 481.


485/685 Quantum Mechanics I 3 Operators, one-dimensional wells and barriers, Schrodinger equation, uncertainty, duality, Born interpretation, unstable states, bosons and fermions, central force problems, angular momentum, spin. Prereq: PHYS 350, MATH 266.


489 Physics Projects 1-4 Capstone experience in physics.

752, 753 Mathematical Methods in Physics I, II 3 each See MATH 782, 783 for description. Prereq for 753: PHYS 752.


758 Statistical Physics 3 Review of thermodynamics and statistical mechanics; Monte Carlo and molecular dynamics simulation; applications to phase transitions. Prereq: PHYS 463.


771, 772 Quantum Physics I, II 3 each Schrodinger equation, wave packets, uncertainty, angular momentum, spin, second quantization, harmonic oscillator, resistance mechanisms, 2 lectures, 1 laboratory. Prereq for 771: PHYS 486, PPTH 324. For 772: PHYS 771. S (odd years)

781 Solid State Physics 3 Crystal structure and binding, reciprocal lattices and x-ray diffraction, lattice vibrations, thermal properties, free electron model, band theory, magnetism, superconductivity. Prereq: PHYS 485/685.

782 Condensed Matter Physics 3 An introduction to soft condensed matter, focusing on colloids, polymers, liquid crystals, surfactants, and biological systems. Topics will include characterization of soft materials, interparticle interactions, structure, equilibrium phase behavior, non-equilibrium properties, and practical applications. Prereq: PHYS 463/663.

PLANT PATHOLOGY (PPTH) Rasmussen, Chair; Adhikari, del Rio, Goswami, Gudmestad, Kangas, Meinhardt, Neate, Nelson, Secor, Zhong

COURSES

324 Introductory Plant Pathology 3 Etiology, symptomology and control of representative plant diseases and demonstrations. 2 lectures, 1 laboratory. F

453/653 Microscopy 3 Principles, advantages, and limitations of light and electron microscopic techniques, including sample preparation, data acquisition, interpretation, and photographic techniques. 2 lectures, 1 laboratory, S (odd years)

454/654 Diseases of Field and Forage Crops 3 Etiology, symptomology, control, and importance of field and forage crop diseases. 2 lectures, 1 laboratory. Prereq: PPTH 324. S (even years)

455/655 Plant Disease Management 3 Diagnosis and control of horticultural crop diseases. 2 lectures, 1 laboratory. Prereq: PPTH 324. S (odd years)

456/656 Forest and Shade Tree Pathology (CCN) 3 Biotic and abiotic sources of tree decline are included, as are some pathogens of forest products. Recognition and treatment techniques will be covered. Emphasis of field diagnostic skills. Prereq: PPTH 324. S (odd years)

460/660 Fungal Biology 3 Fungal ecology, morphology, genetics, physiology, taxonomy, and relevance to humans. 2 lectures, 1 laboratory. Prereq: BIOL 150, PPTH 324. F (even years)

751 Physiology of Plant Disease 3 Infection, penetration, recognition, nutrient transfer, toxins, photosynthesis, and physiological materials. Use of tools, equipment, and supplies used in the industry and application of basic design styles, holiday designs, and displays. 1 lecture, 1 two-hour laboratory. S (odd years)

754 Plant Disease Epidemiology 3 Temporal and spatial dynamics of diseases and causative pathogens in plant populations. 2 lectures, 1 laboratory. Prereq: PPTH 324. F (even years)

756 Techniques in Electron Microscopy 3 Operation of transmission and scanning electron microscopes and ancillary equipment. Techniques include fixation, dehydration, critical point drying, embedding, ultra thin sectioning, and metallic sample coating. 1 lecture, 2 laboratories. F (odd years)

758 Bacterial, Nematode, and Viral Diseases of Plants 4 Biology, epidemiology, and management of plant diseases caused by bacteria, nematodes and viruses. Prereq: PPTH 324. F (odd years)

759 Host-Parasite Genetics 3 Host-parasite genetics including genetics of plant and pathogens and gene-for-gene relationships. 3 lectures. S (even years)

760 Advanced Mycology 4 Biology and classification of fungi. Emphasis on identification, growth and development, physiology, and etiology of fungi. 2 lectures, 2 laboratories. Prereq: PPTH 460. F (odd years)

761 Advanced Plant Pathology 2 Analysis of advanced and integrated concepts in host-parasite relationships, disease control, mechanisms of resistance, biotechnology, and professionalism. 3 lectures. Prereq: PPTH 324. F (even years)

PLANT SCIENCES (PLSC) Cai, Carena, Christoffers, Dai, David, Deckard, Elias, Friesen, Grafton, Hammond, Hatterman-Valenti, Helms, Herman, Horswill, Howard, Johnson, Kandell, Kianian, Laschkewitsch, Lee, Li, Lynn, Manthey, McClean, McMullen, Mergoum, Meyer, Osorno, Ransom, Schwarz, Simsek, Smith, Stackler, Thompson, Williams, Zeleznik, Zhang, Zollinger, Zuk

COURSES

110 World Food Crops (CCN) 3 Scientific principles of crop growth, worldwide production, management alternatives, and processing for domestic and international consumption. 2 lectures, 1 discussion, 1 tutorial laboratory. F, S (ND:SCI)

111 Genetics and You (CCN) 2 Basic concepts in genetics with emphasis on current human genetics. 2 lectures. NDS:SCI)

177 Floral Design (CCN) 2 History of floral design, care, handling, and identification of fresh cut flowers and dried materials. Use of tools, equipment, and supplies used in the industry and application of basic design styles, holiday designs, and displays. 2 lectures, 1 two-hour laboratory. S (ND:LABSC)

210 Horticulture Science (CCN) 3 Principles of plant classification, structure, function, growth, propagation, culture, and use of horticultural crops. Covers vegetable and fruit production in the home garden, growing flowers and planting flower beds, and landscaping principles and materials. 3 lectures. F, S (ND:LABSC)

211 Horticulture Science Laboratory (CCN) 1 Exercises in plant identification, propagation, nutrition, gardening, greenhouses, lawn care, landscape design, interior plants, pruning, and culture of horticultural crops. 1 two-hour laboratory. F (ND:LABSC)

215 Weed Identification (CCN) 1 Identification of weed seeds and plants from seedling to mature stages. Emphasis on life cycles, common distribution, and family groupings. 1 one and one half-hour laboratory plus time by arrangement. F
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>219/219L</td>
<td>Introduction to Prairie and Community Forestry (CCN)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>315, 315L</td>
<td>Genetics, Lab</td>
<td>3, 1</td>
<td>PLSC 110, S</td>
</tr>
<tr>
<td>320</td>
<td>Principles of Forage Production</td>
<td>3</td>
<td>PLSC 110, F</td>
</tr>
<tr>
<td>323</td>
<td>Principles of Weed Science (CCN)</td>
<td>3</td>
<td>PLSC 110, F</td>
</tr>
<tr>
<td>335</td>
<td>Seed Technology and Production</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>340</td>
<td>Grain Grading</td>
<td>2</td>
<td>Plsc 110, S/2</td>
</tr>
<tr>
<td>341</td>
<td>Landscape Bidding and Contracting</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>350</td>
<td>Sugarbeet Production</td>
<td>2</td>
<td>PLSC 110 or 210, F/2</td>
</tr>
<tr>
<td>355</td>
<td>Woody Landscape Plants</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>360</td>
<td>Horticultural Food Crops</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>362</td>
<td>Potato Science</td>
<td>2</td>
<td>Coreq: BIOL 150 or 151, PLSC 110 or 210, F/2</td>
</tr>
<tr>
<td>365</td>
<td>Herbaceous Landscape Plants (CCN)</td>
<td>3</td>
<td>Coreq: BIOL 150 or 151, PLSC 210, F (odd years)</td>
</tr>
<tr>
<td>368</td>
<td>Plant Propagation and Management</td>
<td>3</td>
<td>Coreq: BIOL 150 or 151, PLSC 210, F (odd years)</td>
</tr>
<tr>
<td>375</td>
<td>Turfgrass Management</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>381</td>
<td>Sports Turf Operations</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>411/411L</td>
<td>Genomics</td>
<td>3</td>
<td>Coreq: BIOL 150, STAT 330, F</td>
</tr>
<tr>
<td>412</td>
<td>Nursery Production and Management</td>
<td>3</td>
<td>PLSC 368, S (odd years)</td>
</tr>
<tr>
<td>422</td>
<td>Greenhouse Production and Management</td>
<td>3</td>
<td>Coreq: PLSC 368, S (even years)</td>
</tr>
<tr>
<td>431/431L</td>
<td>Intermediate Genetics</td>
<td>3</td>
<td>Coreq: PLSC 315, Cross-listed with BOT and ZOO, F</td>
</tr>
<tr>
<td>433/433L</td>
<td>Weed Biology and Ecology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>436/436L</td>
<td>Genetics and Plant Improvement</td>
<td>3</td>
<td>Coreq: BIOL 150 or 151, PLSC 210, S (odd years)</td>
</tr>
<tr>
<td>453/453L</td>
<td>Advanced Weed Science</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>457</td>
<td>Turfgrass Science, Ecology, and Management</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>468</td>
<td>Golf Course Irrigation I</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>484/484L</td>
<td>Plant Tissue Culture and Micropropagation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>485/485L</td>
<td>Arboriculture Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>490</td>
<td>Golf Course Irrigation II</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>486/486L</td>
<td>Eco-Physiology of Horticultural Crops</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>490</td>
<td>Professional Development I</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>710</td>
<td>Professional Development II</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>711</td>
<td>Professional Development II</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
<td>Prerequisites</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>721</td>
<td>Genomics Techniques</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Principles, techniques, and applications of the large-scale analysis of DNA organization and sequence, RNA expression, protein sequence, and structure. Prereq: PLSC 411/611. Cross-listed with BIOC. S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>724</td>
<td>Field Design I</td>
<td>3</td>
<td>Application of various field designs, factorial and split-plot arrangements, orthogonal and non-orthogonal comparisons, models, components of variance, correlation, and regression to biological problems. 3 lectures. Prereq: STAT 330 or 725. F</td>
</tr>
<tr>
<td>727</td>
<td>Crop Breeding Techniques</td>
<td>1</td>
<td>Hybridization of North Dakota crops. Laboratory by arrangement. Prereq: PLSC 446/646, 724. SS (odd years)</td>
</tr>
<tr>
<td>731</td>
<td>Plant Molecular Genetics</td>
<td>3</td>
<td>Molecular aspects of plant genome organization and expression; basic and applied usages of molecular markers and gene transfer techniques. 3 lectures. Prereq: PLSC 451/651. S (even years)</td>
</tr>
<tr>
<td>734</td>
<td>Field Design II</td>
<td>2</td>
<td>Application of incomplete block designs, confounding, and covariance analyses to biological problems. 2 lectures. Prereq: PLSC 724. S (odd years)</td>
</tr>
<tr>
<td>741</td>
<td>Cytogenetics</td>
<td>4</td>
<td>Chromosome behavior during mitosis and meiosis; chromosome structure, function, and recombination; inheritance in aneuploids and polyploids; haploid formation and utilization. 3 lectures, 1 three-hour laboratory. Prereq: PLSC 315. F (even years)</td>
</tr>
<tr>
<td>751</td>
<td>Advanced Genetics</td>
<td>3</td>
<td>Classical and modern genetic concepts, nature and induction of mutations linkage, and application of chi-square. 3 lectures. Prereq: PLSC 431/651. S (odd years)</td>
</tr>
<tr>
<td>753</td>
<td>Action and Fate of Herbicides</td>
<td>2</td>
<td>Herbicide mode of action and fate of herbicides in plants and soil, physiology of herbicide resistance, and herbicide antidotes. 2 lectures. Prereq: PLSC 453/653. S (even years)</td>
</tr>
<tr>
<td>755</td>
<td>Advanced Crop Management Decision Making</td>
<td>3</td>
<td>Problem-based learning approach focusing on the scientific, professional, personal, and ethical issues associated with advanced crop management decision-making. Prereq: PLSC 455/655. F (even years)</td>
</tr>
<tr>
<td>763</td>
<td>Laboratory Methods — Weed Science</td>
<td>2</td>
<td>Chemical, analytical, and physiological methods for determining pesticide residues in soil and ground water; and herbicide absorption, translocation, and metabolism in plants. 2 two-hour laboratories. Prereq: PLSC 453/653. S</td>
</tr>
<tr>
<td>776</td>
<td>Advanced Plant Breeding</td>
<td>4</td>
<td>Application of genetic principles to improvement of self- and cross-pollinated crops. 4 lectures. Prereq: PLSC 446/646, 724. S (odd years)</td>
</tr>
<tr>
<td>780</td>
<td>Population Genetics</td>
<td>2</td>
<td>Concepts and principles related to genetic properties governing random and non-random mating populations. 2 lectures. Prereq: PLSC 315, STAT 330. F (odd years)</td>
</tr>
<tr>
<td>781</td>
<td>Quantitative Genetics</td>
<td>2</td>
<td>Applied quantitative genetics and implications on plant breeding. 2 lectures. Prereq: PLSC 724, 780 Recommended: 446/646. S (even years)</td>
</tr>
<tr>
<td>785</td>
<td>Crop Breeding Programs Management</td>
<td>2</td>
<td>Development of student ability to understand, examine, and evaluate crop breeding and improvement programs. Prereq: PLSC 446/646, 724. F (even years)</td>
</tr>
<tr>
<td><strong>POLITICAL SCIENCE (POLS)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>Introduction to Political Science (CCN)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Problems of political science as a discipline, political systems, and political behavior. Includes causes and consequences of individual and group political behavior. (ND:SS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>American Government (CCN)</td>
<td>3</td>
<td>Principles of American government, political behavior, and institutions. (ND:SS)</td>
</tr>
<tr>
<td>120</td>
<td>Terrorism (CCN)</td>
<td>3</td>
<td>Examination of problems of terrorism. Includes its historical perspectives; terrorist motivations, organizations, tactics, strategies; role of media; government responses; future trends, prospects. (ND:SS)</td>
</tr>
<tr>
<td>210</td>
<td>Current Politics (CCN)</td>
<td>3</td>
<td>Study of current national and state political issues.</td>
</tr>
<tr>
<td>215</td>
<td>Problems and Policies in American Government (CCN)</td>
<td>3</td>
<td>Study of the functioning of American government focusing on the policy process. (ND:SS)</td>
</tr>
<tr>
<td>216</td>
<td>Campaigns and Elections</td>
<td>3</td>
<td>Examination of political campaigns and elections with special emphasis for voting behavior, history and theory of political advertising, and effectiveness/ethics of negative advertising. Prereq: POLS 115.</td>
</tr>
<tr>
<td>220</td>
<td>International Politics (CCN)</td>
<td>3</td>
<td>Concepts, theories, and issues in international relations. (ND:SS)</td>
</tr>
<tr>
<td>225</td>
<td>Comparative Politics (CCN)</td>
<td>3</td>
<td>Comparative analysis of contemporary political systems, practices, institutions, and actors. (ND:SS)</td>
</tr>
<tr>
<td>230</td>
<td>Judicial Process (CCN)</td>
<td>3</td>
<td>Role of lawyers, judges, and courts in the political system. Special emphasis on judicial decision-making and the ideas behind law.</td>
</tr>
<tr>
<td>240</td>
<td>Political Ideologies (CCN)</td>
<td>3</td>
<td>Study of ideas, belief systems, and basic principles of ideologies.</td>
</tr>
<tr>
<td>325</td>
<td>Applied Research Methods</td>
<td>4</td>
<td>This course provides an overview of the scientific model, the philosophy and goals of science, and a detailed study of quantitative and quantitative methodologies. Lecture, laboratory. Cross-listed with COMM and CJ.</td>
</tr>
<tr>
<td>350</td>
<td>Gender Issues and the Law</td>
<td>3</td>
<td>This course examines gender differentiations reflected in the U.S. law from both the historical and contemporary perspectives and the impact of that differentiation, particularly on women, in the areas of employment, education and family law.</td>
</tr>
<tr>
<td>351</td>
<td>Women and Politics</td>
<td>3</td>
<td>Study of women leaders; their roles and perspectives within a national and international framework.</td>
</tr>
<tr>
<td>360</td>
<td>Principles of Public Administration</td>
<td>3</td>
<td>Empirical study of public administrators in their diverse roles and functions.</td>
</tr>
<tr>
<td>420/620</td>
<td>Political Behavior — Executive-Legislative Process</td>
<td>3</td>
<td>Behavioral study of executives and legislators with emphasis on examination of empirical data.</td>
</tr>
<tr>
<td>421/621</td>
<td>Political Behavior — Political Parties</td>
<td>3</td>
<td>Behavioral study of political leaders with emphasis on examination of empirical data.</td>
</tr>
<tr>
<td>422/622</td>
<td>State and Local Politics</td>
<td>3</td>
<td>This course is designed to guide students through a discovery of American politics at the sub-national level. From a comparative perspective, students examine differences between states in terms of their political structures, behavior, and environments. Prereq: Junior standing.</td>
</tr>
<tr>
<td>430/630</td>
<td>Constitutional Law — Civil Liberties</td>
<td>3</td>
<td>Examination of First Amendment rights including freedom of speech, press, religion, association, and assembly. Due process and equal protection concerns are also addressed.</td>
</tr>
<tr>
<td>442/642</td>
<td>Global Policy Issues</td>
<td>3</td>
<td>Analysis of the impact of planetary limits to growth, increasing globalization of the world economy, and changing control over resource systems on global politics.</td>
</tr>
<tr>
<td>444/644</td>
<td>International Law</td>
<td>3</td>
<td>Examines the history and foundation of the international legal system, including custom, treaties, jurisdiction, and the relationship between international and municipal law. Prereq: POLS 220.</td>
</tr>
<tr>
<td>445/645</td>
<td>Ethnic Conflicts</td>
<td>3</td>
<td>Explores numerous topics and cases related to ethnic conflicts, including the nature of ethnic identity, the causes of ethnic conflicts, and ethnic conflict prevention/resolution.</td>
</tr>
<tr>
<td>450/650</td>
<td>Politics of the Developing Countries</td>
<td>3</td>
<td>Comparative examination of the government and politics of developing countries. Attention is given to special economic and cultural circumstances facing the political systems of these countries.</td>
</tr>
<tr>
<td>451/651</td>
<td>Politics of the Industrialized Countries</td>
<td>3</td>
<td>Comparative study of government and politics in the industrialized countries including the analysis of legislative and executive branches, parties, bureaucracies, constitutions, policies, and voting behavior.</td>
</tr>
<tr>
<td>452/652</td>
<td>Comparative Political Economy</td>
<td>3</td>
<td>Comparative study of the relationship between politics and the economy in industrialized and developing countries. Topics include elections, trade, development, investment, redistribution, and the political business cycle.</td>
</tr>
</tbody>
</table>
453/653 Environmental Policy/Politics 3
Course is designed to provide students with both a general and advanced understanding of environmental issues. Will examine philosophical underpinnings informing environmental policy making as well as analyze various substantive environmental issues in US.

489 Senior Seminar 3
Capstone experience. Emphasis on integrative skills needed to interrelate the concepts of the discipline.

720 Theoretical Perspectives to the Study of Political Science 3
Designed to guide beginning graduate students through the dominant paradigms and emerging subject areas of political science scholarship.

PSYCHOLOGY (PSYC)

Rokke, Chait, Blakeslee, Brady, Coleman, Council, Donohue, Friesen, K. Gordon, R. Gordon, W. Gordon, Hilpert, Hinsz, Langley, McCaul, McCourt, Nawrot, O'Neal, Ostaain, Rainville, Robinson, Routledge, Teder-Salejarvi, Wittrock

CORESSES

111 Introduction to Psychology (CCN) 3
Survey of the scientific study of behavior and mental processes. (ND:SS)

210 Human Sexuality 3
Survey of biological, developmental, and psychological aspects of human sexuality. Prereq: PSYC 111.

211 Introduction to Behavior Modification 3
Basic principles and procedures governing acquisition, maintenance, and change of behavior, emphasizing human applications. Laboratory involves designing, implementing, and reporting an individual project. Prereq: PSYC 111.

212 Psychological Aspects of Drug Use and Abuse 3
Examination of legal and illegal psychoactive drugs. Emphasis on psychological, physiological, and behavioral effects of these drugs and problems of drug abuse. Prereq: PSYC 111.

214 Social Interaction 3
See Sociology for description. (ND:SS)

221 Psychology in Business and Industry 3
Applications of psychology to work/business. Topics include personnel selection/placement, job satisfaction and morale, motivation, leadership, group performance, and organizational theory/development. Prereq: PSYC 111. (ND:SS)

250 Developmental Psychology (CCN) 3
Survey of the psychology of human life span development. Coverage also includes heredity and prenatal development. Prereq: PSYC 111. (ND:SS)

260 Introduction to Neuroscience 3
An introduction to behavioral neuroscience with an emphasis on what we know about human brain function and what it means for studying and understanding complex human behavior.

270 Abnormal Psychology (CCCN) 3
Survey of the classification, symptoms, and etiology of psychological disorders. Attention given to diagnosis, etiology, and treatment according to prominent theoretical perspectives. Focus on empirical basis for understanding these problems. Prereq: PSYC 111. (ND:SS)

280 Introduction to Health Psychology (CCCN) 3
Describes the interaction of psychology and health, including the ways in which thoughts, emotions, and behavior influence one's health. Prereq: PSYC 111.

322 Thinking and Making Decisions 3
Covers the functional uses of critical thinking. Focuses on uses in problem solving and decision-making. Applications are directed at both personal and professional concerns. Prereq: PSYC 111.

350 Research Methods I 3
Introduction to scientific method, ethics, principles of observation, measurement, survey research, and correlation. Laboratory training in conducting research, analyzing data, and preparing research reports. Prereq: PSYC 111, MATH 103. Coreq: STAT 330.

351 Research Methods II 3
Experimental and quasi-experimental designs in psychological research. Laboratory includes performance of experiments, data analysis, and preparation of research reports. Prereq: PSYC 350.

360 Animal Behavior 3
See Biological Sciences (Zoology) for description.

370 Forensic Psychology 3
Broad overview of the interactions of psychology and the law, including current areas of practice, assessment, and forensic techniques. Special focus upon psychology as applied to and affected by family, civil, and criminal law. Prereq: PSYC 270.

380 Clinical Psychology 3
Introduction to the science and practice of clinical psychology. Includes a survey of the assumptions on which clinical methods are based and an overview of clinical assessment and treatment techniques. Prereq: PSYC 270.

381 Understanding Suicide and its Impact 3
Overview of current understanding of the dynamics of suicide and its impact upon people left behind following the death.

382 Self-Injury: Recognition and Treatment 3
Overview of the current understanding of the dynamics of self-injurious behavior, of the prevalence of various types of harmful behavior, and of the populations most at risk.

385 Psychology on Film 3
Many important issues and topics in psychology have been illuminated via laboratory experiments. Prereq: PSYC 351.

410/610 Introduction to Health Psychology 3
Describes the interaction of psychology and health, including the ways in which thoughts, emotions, and behavior influence one's health. Prereq: PSYC 111.

422 Thinking and Making Decisions 3
Covers the functional uses of critical thinking. Focuses on uses in problem solving and decision-making. Applications are directed at both personal and professional concerns. Prereq: PSYC 111.

430 Research Methods I 3
Introduction to scientific method, ethics, principles of observation, measurement, survey research, and correlation. Laboratory training in conducting research, analyzing data, and preparing research reports. Prereq: PSYC 111, MATH 103. Coreq: STAT 330.

431 Research Methods II 3
Experimental and quasi-experimental designs in psychological research. Laboratory includes performance of experiments, data analysis, and preparation of research reports. Prereq: PSYC 350.

460/660 Sensation and Perception 3
Explores physical, anatomical, and physiological bases of sensation and perception and their psychophysical measurement. Laboratory experiments complement lectures and demonstrate various experimental techniques and sensory phenomena. 2 lectures, equivalent of 2-hour laboratory. Prereq: PSYC 351 or PSYC 260.

461/661 Memory and Knowledge 3
Examination of current behavioral and neuropsychological research and theory in the area of memory and knowledge representation. Various cognitive phenomena are demonstrated and relevant design issues are highlighted via laboratory experiments. Prereq: PSYC 351.

463/663 Experimental Development Psychology 3
Examination of historical and contemporary theory and research in social and cognitive development. Topics include attachment, adolescent risk-taking, theories of intelligence, and meta-cognition. Laboratory experiences illustrate methods of investigating psychological development. Prereq: PSYC 351.

464/664 Attention and Thinking 3
Examines current behavioral and neuropsychological research and theory in the area of attention and thought processes. Laboratory experiments will demonstrate various attentional phenomena and highlight relevant design issues.

465/665 Psychobiology 3
Fundamental anatomy (structure) and physiology (function) of the nervous system. Physiological bases of behavior. 2 lectures, equivalent of 2-hour laboratory. Prereq: PSYC 351 or PSYC 260.

468/668 Personality 3
Study of complex human behavior with attention to historically significant theories and current empirical issues. Laboratory experiences illustrate methods of investigating individual differences. Prereq: PSYC 351.

470/670 Experimental Social Psychology 3
Examination of historical and contemporary theory and research in social psychology. Study of the relationship between the individual and social context. 2 lectures, equivalent of 2-hour laboratory. Prereq: PSYC 351 or PSYC 260.

471/671 The Psychology of Aging 3
Survey of cognitive and psychosocial development in adulthood and old age, including psychopathologies of old age. Contemporary research findings are emphasized. Prereq: PSYC 111, Junior standing.

472/672 Advanced Psychopathology 3
In-depth coverage of recent research on diagnosis, etiology, and maintenance of behavior disorders emphasizing the interaction of biological, behavioral, and social factors. Prereq: PSYC 270, Junior standing.

473/673 Child Psychopathology and Therapy 3
Overview of the etiology and treatment of behavior disorders in children and adolescents. Emphasis on recent research findings and behavioral intervention strategies. Prereq: PSYC 270 or 351.

474/674 Behavior Analysis in Developmental Disabilities 3
Overview of developmental disabilities with emphasis on mental retardation. Application of behavior analysis procedures for skills training, functional assessment and treatment of problem behaviors and staff management. Students participate in assessment and treatment projects. Prereq: PSYC 211.
480/680 History and Systems 3
Historical development of scientific psychology. Emphasis on the development of various systems of psychology in America. Capstone experience. Prereq: PSYC 351 or Senior standing.

481/681 Health Psychology 3
Application of behavioral procedures to the prevention, treatment, and rehabilitation of medical disorders. Emphasis on contemporary research findings. Prereq: PSYC 350 or PSYC 260.

486/686 Neuropsychology 3
Introduction to human neuropsychology with emphasis on the neural basis of motor, perceptual, cognitive, emotive, and language behavior. Topics include normal and pathological conditions from clinical and experimental perspectives. Prereq: PSYC 351 or PSYC 260.

489 Honor Thesis 2-6
Capstone experience option.

718 Visual Neuroscience 3
A detailed survey of current ideas, methods, and perspectives in visual neuroscience.

720 Cognitive Neuroscience 3
Examines prominent theories, research approaches, and experimental findings in the field of cognitive neuroscience. Included topics are methodological issues and cognitive neuroscience approaches to research questions in a broad range of areas within cognitive psychology.

727 Advanced Topics in Visual Perception 3

731 Fundamental Processes in Cognition 3
Exploring the underlying architecture of the human cognitive system—how it takes in, processes, stores, and retrieves information.

732 Applied Cognitive Processes 3
Explores the ways cognitive principles operate in ecologically valid (real-world) situations.

733 Social Judgment 3
Explores issues and topics related to judgment and decision-making in social contexts as well as the influence of social factors on judgment processes.

735 Neural Networks 3
See Computer Science for description.

750 Introduction to Clinical Issues and Practices 1
Instruction and practice in clinical interview techniques and discussion of clinical issues including ethics, laws, and crisis intervention.

755 Behavior Therapy and Assessment I 4
Introduction to the nature and characteristics of behavioral assessment and behavior therapy. Laboratory includes behavioral interviewing and training in assessment and treatment procedures.

756 Behavior Therapy and Assessment II 4
In-depth coverage of behavioral assessment and treatment approaches, emphasis on their empirical status. Laboratory includes instruction with practice in implementation of these procedures. Prereq: PSYC 755.

760 Research Methods in Visual and Cognitive Neuroscience 3
This course provides both theoretical and practical training in methodological skills essential for the conduct of high-quality research in the field of visual and cognitive neuroscience. May be repeated with change in topic.

761 Applied Research Methods 3
Experimental methodology and design skills useful in clinical research including N=1 designs, experimental, and quasi-experimental designs. Laboratory includes reports on recent research articles, presentations on specific content areas, and development of a detailed research proposal.

762 Advanced Research Methods and Analysis 3
Advanced experimental design and data analysis. Emphasis on regression models as applied to psychological data and designs. Includes analysis on the computer. Lecture, laboratory. Prereq: PSYC 640.

764 Advanced Topics in Attention 3
Examines prominent theories of attention and empirical evidence in support of those theories. Included topics focus on the role of attention in thought, perception, and action.

770 Advanced Psychological Assessment 3
Comprehensive approach to assessment in clinical psychology. Includes administration, interpretation, and report writing. Primary focus on Wechsler intelligence scales and personality testing by objective and projective methods.

771 Social/Health Psychology Research 3
Covers research designs frequently utilized in conducting social psychology research with particular emphasis on health psychology.

782 Emotions 3
Focused on basic questions about defining emotions, differences in experiencing or expressing emotions, and relatedness to cognition. Includes emotions and psychotherapy, emotions in a social context, and the impact of emotional expressions versus repression on health.

787 Advanced Social Psychology and Health 3
Covers theory and research from social psychology that has implications for health behavior. Emphasizes theories of attitudes and behavior applied to such topics as regimen adherence, self-protective health behavior, and disease prevention. Prereq: PSYC 670, 681.

RADIOLOGIC SCIENCES (RS)
P. Olson

COURSE
111 Introduction to Radiologic Sciences 1
Lectures, discussions, and field trips focus on professional traits, ethical behavior of the health care provider, major curriculum requirements, and scope of practice.

RANGE SCIENCE (RNG) [ARSC]
Biondini, DeKeyser, Grygiel, Kirby, Sedivec

COURSES
225 Natural Resource and Agro-Ecosystems 3
Introduction to scientific theories and their relation to natural resources and agriculture. Influence of these theories on current perspectives toward the environment. 3 lectures. Cross-listed with NRM. (ND:SCI)

326 Modeling of Range and Agro-Ecosystems 3
Introduction and applications of systems analysis and simulation modeling to agriculture, biology, range ecology, and natural resources management. 2 lectures, 1 two-hour laboratory. (even years)

336 Introduction to Range Management (CCN) 3
Principles of range management that include plant identification, range evaluation, and range improvement. 3 lectures. F

450/650 Range Plants 3
Identification, distribution, and forage value of important U.S. range plants. 1 lecture, 2 two-hour laboratories. Prereq: BOT 314. Cross-listed with BOT. F

452/652 Geographic Information Systems in Range Survey 3
Analysis of methods for determining range composition, condition, and productivity. Emphasis will be given to the use of Geographic Information Systems. 3 lectures. Prereq: RNG 336. F (odd years)

453/653 Rangeland Resources Watershed Mgmt 3
Study of the management of physical/biological settings and processes along with human activities on water and watersheds considering preventative and restorative strategies in a rangeland setting. Cross-listed with NRM. S

454/654 Wetland Resources Management 3
See Natural Resources Management for description.

456/656 Range Habitat Management 3
Study of specific techniques and systems approaches to maintenance and improvement of rangeland ecosystems. 3 lectures. Prereq: RNG 336. S (even years)

458/658 Grazing Ecology 3
Grazing processes and systems and their effects on plants and herbivores. 3 lectures. Prereq: RNG 336. S (even years)

460/660 Plant Ecology 3
See Biological Sciences (Botany) for description.

462/662 Rangeland Planning and Analysis 3
Developing the basics of planning and the use of advanced planning tools for managing public and private rangelands. Prereq: RNG 456/656, 458/658.

716 Agrostology 3
Identification and description of U.S. grasses and grass-like plants. 2 lectures, 2 two-hour laboratories. Prereq: BOT 314. Cross-listed with BOT. F (even years)

717 Aquatic Vascular Plants 2
Identification and description of aquatic vascular plants. 1 lecture, 2 two-hour laboratories. Prereq: BOT 314. Cross-listed with BOT. F (odd years)

765 Analysis of Ecosystems 3
Introduction to advanced statistical techniques to evaluate plant communities, plant-animal interactions, and plant-soil relationships. Emphasis on multivariate analysis, 2 lectures, 1 two-hour laboratory. Prereq: STAT 330. $ (even years)
RELIgIOUS STUDIES (RELS)

Helgeland

COURSES

100 Introduction to Religion (CCN) 3
Introduction to the ways religious concerns are expressed, to religious values as a basis for human action, and to a spectrum of ethical styles. (ND:HUM)

210 Ethics 3
See Philosophy for description.

220 Old Testament (CCN) 2
Study of the religious, political, and social history of ancient Israel as reflected in the Hebrew Bible.

230 New Testament (CCN) 3

243 Religion and Self (CCN) 3
Psychological and ethical issues involved in growth to religious maturity. Attention to basic human activities such as love, faith, marriage, sexuality, death, and grief.

270 American Religious History (CCN) 3
Introduction to the basic issues in American history including the study of Puritans, immigration, church and state, revivalism, civil and military religion, apocalypticism, and new age religion. Cross-listed with HIST.

315 Contemporary Religion 3
Study of how contemporary cultural developments require the rethinking of historic religious perspectives in such topics as natural science, political thought, psychology, history, and gender.

320 History of Christianity 3
Major developments in the Christian religion including scriptures, persecution, monasticism, papacy, Reformation, science and religion, and the ecumenical movement. Cross-listed with HIST.

401 Sociology of Religion 3
See Sociology for description.

453 Magic and Religion 3
See Anthropology for description.

RESPIRATORY CARE (RC)
P. Olson

COURSE

111 Introduction to Respiratory Care 1
Introduction to the profession of respiratory care. Lectures, discussions, and field trips focus on professional traits and communication, ethical behavior of the health care provider, major curriculum requirements, and scope of practice.

SOCIOLoGY (SOC)

Klenow, Chair; Biga, Corwin, Dingel, Goreham, Klenow, Rathge, Smith, Weber, Youngs

COURSES

110 Introduction to Sociology (CCN) 3
Introductory analysis of the nature of society, the inter-relationship of its component groups, and the process whereby society persists and changes. (ND:SS)

115 Social Problems (CCN) 3
Sociological analysis of major social problems.

150 Cornerstone in Sociology 3
This course provides an integrative in-depth survey of the discipline of sociology for sociology majors only. The course will focus on the core areas of the discipline as well as subdisciplinary areas. Prereq: SOC 110.

202 Minorities and Race Relations 3
Analysis of lifestyles and characteristics of racial, cultural, and ethnic groups in society. Review of processes of discrimination, prejudice, and related dehumanizing biases toward minority groups including women. Prereq: SOC 110. (ND:SS)

214 Social Interaction 3
Examination of issues relevant to the study of individual behavior (e.g., self-concept, attitudes, social perception) in a social context. Cross-listed with PSYC. (ND:SS)

233 Sociology of Organizations and Work 3
This course examines major types of organizations, their goals, and characteristics. The course focuses on social issues as they relate to organizations and work.

340 Social Research Methods 3
Overview of the scientific method, the philosophy of science, and the goals of science. Detailed study of qualitative and quantitative methodologies. Cross-listed with COMM.

341 Social Research Methods Laboratory 1
Laboratory to accompany SOC 340. Provides application of conceptualization, operationalization, sampling methods, qualitative and quantitative research methods, and computer statistical analysis. Cross-listed with COMM.

401/601 Sociology of Religion 3
Study of religion viewed as a social institution with a characteristic history, ecology, structure, behavior, and purpose. Cross-listed with RELS.

403/603 Sociology of the Great Plains 3
Social and cultural patterns, trends, and problems peculiar to life in the semi-arid Great Plains.

404/604 Community Assessment 3
Students work with community leaders and their towns to conduct an asset-based community assessment of the town's human, social, cultural, political, built, financial, and natural capitals.

405/605 Community Development 3
Study of communities viewed as social systems. Includes political, economic, social, and economic factors affecting community growth and decline. Community development methods are addressed. Prereq: SOC 404/604.

407/607 Deviant Behavior 3
See Criminal Justice for description.

410/610 Social Inequality 3
Analysis of social and economic inequities and investigation of the relationship between inequality and life chances.

412/612 Sociology of Sex Roles 3
The socialization of men and women; an analysis of institutional norms, values, and attributes and their effects on gender role development. Prereq: SOC 110.

416 Sociology Through Literature 3
Study of basic concepts of sociology as illustrated in selected literature from 19th and 20th century English, American, French, and Russian novels. Prereq: SOC 110.

417/617 Sociology of the Family 3
Comparative family types, member relationships, family dynamics in relation to personality, social change, and social values.

418/618 Social Psychology 3
Introduction of both historical and contemporary research and theory in social psychology—the study of the relationship between the individual and the social context. Prereq: SOC 110.

420 Sociology of Disaster 3
Examination of natural and human-made disasters, stages of a disaster, social impacts of a disaster, and community, organizational, and governmental responses to disaster. Explores U.S. and cross-cultural disaster research.

422/622 Development of Social Theory 3
Sociological theories and systems from Comte, Marx, Durkheim, and Weber through the 20th century. Prereq: SOC 110.

424/624 Feminist Theory and Discourse 3
Historical overview of feminist ideas and major writings from the 18th century to the present, which includes issues related to women's personal, social, and public lives.

426/626 Sociology of Medicine 3
Analysis of the social aspects of health and illness, the health care professions, organization of health care, and related issues.

431/631 Environmental Sociology 3
Examines the interactions between the biophysical environment and human society, how social processes define, construct, and threaten the environment, and the human causes and consequences of environmental problems and their solutions.

439/639 Social Change 3
Analysis of the complex nature of social change in communities, the nation, and internationally. Prereq: SOC 110.

440/640 Sociology of Aging 3
Examination of sociological perspectives on aging. Topics include social theories of aging, retirement, long-term care, chronic illness, and death.

441/641 Sociology of Death 3
Examination of research on social psychological and social organizational dimensions of death and dying. Additional topics include hospice movement, grief and bereavement, and communicating death news.

443/643 International Disasters 3
Impacts of natural and human-made disasters on industrialized and developing societies; relief and reconstruction post-disaster programs.

445/645 Special Populations in Disasters 3
Identification of special populations and their needs that arise in emergency or disaster situations both in industrialized and developing countries.
SOIL SCIENCE (SOIL)

Akyuz, Casey, Chilcote, DeSutter, Franzen, Goos, Hopkins, Overstreet, Prunty

COURSES

210 Introduction to Soil Science (CCN)  
Physical, chemical and biological properties of soils, as related to use, conservation and plant growth. 2 lectures, 1 laboratory, F,S

217 Introduction to Meteorology and Climatology (CCN)  
Basic meteorology-climatology concepts and their application; includes energy balance, greenhouse effect, temperature, pressure systems, lows, highs, fronts, winds, clouds, storms, humidity, precipitation, and measurements. Lectures, discussions, demonstrations. Prereq: MATH 103, S (ND:SCI)

322 Soil Fertility and Fertilizers (CCN)  
Principles of plant nutrition and soil nutrient availability; soil testing and fertilizer recommendations and management. Macronutrient emphasis. 3 lectures. Prereq: SOIL 210, CHEM 121, 121L, S

351 Soil Ecology  
Principles of soil-plant-animal interactions and their influences on environmental and agricultural issues of global significance (e.g. sustainable agriculture, global climate change, diversity conservation). Prereq: SOIL 210, F

410/610 Soils and Land Use  
Principles of chemistry, physics and biology will be used to determine the effects of soil management, agrichemical usage, livestock production, and vegetation on the environment using scales ranging from microscopic to watershed. Prereq: SOIL 210, CHEM 121, 121L, S

433/633 [333] Soil Physics  
Soil as a three-phase system. Application to soil of physical principles and measurements of soil properties, including density, texture, structure, water content, heat capacity, and transport coefficients. Relationship of properties to agricultural and industrial contamination. 2 lectures, 1 laboratory. Prereq: SOIL 210, PHYS 211, MATH 146, F

444/644 Soil Genesis and Survey  
Introduction to soil development, morphology, and survey. Soil classification, geography, and their interpretation will be highlighted by evaluating physical and chemical soil properties and their distribution at the landscape scale. 5 lectures, 1 three-hour laboratory (includes several field trips). Prereq: SOIL 210, F

447/647 Microclimatology  
Characteristics and causes of the climate near the ground and its interaction with living organisms. Energy and mass transfer concepts. Lectures, discussions, demonstrations, field trips. Prereq: PHYS 211, F (odd years)

465/665 Soil and Plant Analysis  
Laboratory analytical techniques for chemical characterization of soils and determining elemental composition of soils and plant materials for plant nutrition and environmental purposes. 1 lecture, 2 laboratories. Prereq: SOIL 210, CHEM 121, 123, S (odd years)

480/680 Soils and Pollution  
To provide the basic physical, chemical, and biological fate and transport processes of pollution in soils and to neighboring water bodies. Also, how to model and apply these processes to the landscape scale. Prereq: MATH 146, CHEM 121, 121L, S

721 Environmental Field Instrumentation and Sampling  
To provide an overview of the tools (manual and electronic) concepts, and theories used to sample for physical, chemical, and biological parameters. Offered fall semester, odd years, 8-week course. (Two one-hour lectures and one four-hour laboratory per week.)

733 Modeling Environmental Fate and Transport  
To provide the principles of modeling physical, chemical, and biological fate and transport processes for application in current environmental problems. Emphasis placed on mathematically expressing processes and describing observations. Offered spring semester, even years. Prereq: MATH 146 and CHEM 121 and CHEM 121L

755 [455/655] Soil Chemistry  
Soil chemical reactions and equilibria, solubility relationships, mineral weathering, cation and anion adsorption, redox reactions, metal chelation, and fixation of nutrients in the soil. 3 lectures. Prereq: SOIL 322, CHEM 122, 122L, F (odd years)

763 Advanced Soil Physics  
Soil composition, infiltration, retention of water, and chemical absorption. Theory of water, heat, chemical, and solute transport processes of soil. Measurement of soil physical properties. 2 lectures, 1 laboratory. Prereq: SOIL 433 or SOIL 633, PHYS 211, MATH 146 or 165S, S (even years)

782 Advanced Soil Fertility  
Advanced study of soil-plant-nutrient relationships with emphasis on concepts of soil fertility, ion absorption, nutrient transformation, and interpretation of experimental data. 2 lectures. Prereq: SOIL 322, F (even years)

784 Advanced Soil Genesis, Morphology and Classification  
Advanced study of processes of soil development, soil morphology, and principles of soil classification. 2 lectures (field trip and laboratory by arrangement). Prereq: SOIL 444/644, F (even years)

SPANISH (SPAN)

Hawley, Pearson, Soria-Dufner, Stickney

COURSES

101, 102 First-Year Spanish I, II (CCN)  
Basic structures and vocabulary of Spanish. Practice in the fundamentals of listening, speaking, reading, and writing. No previous knowledge of Spanish required for SPAN 101. Prereq for SPAN 102: SPAN 101 (ND:HUM)

201, 202 Second-Year Spanish I, II (CCN)  

311, 312 Spanish Conversation and Composition I, II  
Advanced practice to develop greater proficiency in oral and written skills through the study of cultural and literary readings. Prereq: SPAN 202.

330 Introduction to Spanish Civilization  
Introduction to the social, political and cultural history of Spain. Taught in Spanish. Prereq: SPAN 312.

331 Introduction to Spanish American Civilization  
Introduction to the social, political and cultural history of the Spanish-speaking Americas. Taught in Spanish. Prereq: SPAN 312.

332 Introduction to Hispanic Cinema  
Study of film genres, styles, or movements, focusing on aesthetic conventions, cultural context, socio-historical significance and critical approaches. Prereq: SPAN 312.

401 Advanced Spanish Grammar and Writing  
Writing practice with primary focus on form, syntax, and style. Taught in Spanish. Prereq: SPAN 312, ENGL 120, Junior standing.

402 Advanced Spanish Conversation  
Advanced practice to develop greater oral proficiency through the analysis and discussion of cultural and literary texts. Prereq: SPAN 312.

430 Approaches to Literature  
Emphasis on critical analysis of Spanish-language literary texts from a variety of theoretical perspectives so that students will develop the technical vocabulary necessary to discuss literary texts in Spanish and grasp levels of meaning in the literature. Taught in Spanish. Prereq: SPAN 312.

440 Traditions in Spanish American Literature  
Representative works from the pre-conquest era to the 21st century. Overview of literary movements, genres, and cultural background. Taught in Spanish. Prereq: SPAN 312.

441 Contemporary Spanish American Literature  
Developments and techniques in contemporary texts through representative works. Overview of cultural, historical, and socio-political aspects, as well as literary background. Taught in Spanish. Prereq: SPAN 312.

442 Chicano Literature  
From 19th century Californios, to the Chicano Renaissance and nationalism, as well as contributions from Chicana writers. Taught in Spanish. Prereq: SPAN 312.
443 Spanish American Women Writers 3
Developments and techniques in major texts by Spanish American women writers through representative works. Overview of cultural, historical and socio-political aspects, as well as literary background and criticism. Taught in Spanish. Prereq: SPAN 312.

450 Traditions in Spanish Literature 3
Representative works of the literature of Spain from its epic beginnings to the contemporary period. Overview of literary movements, genres, and cultural background. Taught in Spanish. Prereq: SPAN 312.

451 Contemporary Spanish Literature 3
Representative works of the literature of Spain from modernity forward. Overview of literary movements, genres, and cultural background. Taught in Spanish. Prereq: SPAN 312.

452 Cervantes 3
Study of representative works by Miguel de Cervantes, including Don Quixote. Taught in Spanish. Prereq: SPAN 312.

443 Spanish Women Writers 3
Survey of representative works by women in the Spanish literary tradition. Prereq: SPAN 312.

489 Senior Thesis 1-6
Capstone experience option. Research and original investigation under the guidance of a faculty member. Student work to be written in Spanish.

STATISTICS (STAT) 3

330 Introductory Statistics 3
Frequency tables, histograms, probability, well-known probability distributions, one and two sample tests of hypotheses, confidence intervals, and contingency tables. Prereq: MATH 103, 104, or 107. (ND:MATH)

331 Regression Analysis 2

367 Probability 3
Probability, probability distributions for discrete random variables, probability density functions, marginal joint probability density functions, expected value and variance, and transformations. Prereq: MATH 166.

368 Statistics 3
Moments, moment generating functions, central limit theorem, one and two sample tests of hypotheses, estimation, and simple linear regression and correlation. Prereq: STAT 367.

450/650 Stochastic Processes 3
Discrete time Markov chains, Poisson processes, continuous time Markov chains, birth and death processes, renewal processes, branching processes, queuing systems, and applications. Prereq: STAT 368.

451/651 Bayesian Statistical Decision Theory 3
Bayesian approach to statistics including utility and loss, prior and posterior densities, and Bayesian inference. Comparisons with classical statistical methods. Prereq: STAT 368 or 468.

460/660 Applied Survey Sampling 3
Simple random, stratified, systematic and cluster sampling; two-stage sampling. Estimation of population means and variances. Ratio and regression estimators. Prereq: STAT 330 or 368.

461/661 Applied Regression Models 3
Simple linear regression, matrix approach to multiple regression, and introduction to various tests and confidence intervals. Includes discussion of multicollinearity and transformations. Prereq: STAT 330 or 368, knowledge of matrix algebra.

462/662 Introduction to Experimental Design 3
Fundamental principles of designing an experiment, randomized block, Latin square, and factorial. Also covers analysis of covariance and response surface methodology. Prereq: STAT 330 or 368.

463/663 Nonparametric Statistics 3
Various tests and confidence intervals that may be used when the underlying probability distributions are unknown. Includes the Wilcoxon, Kruskal-Wallis, and Friedman. Prereq: STAT 330 or 368.

464/664 Discrete Data Analysis 3

465/665 Meta-Analysis Methods 3
Statistical methods for meta-analysis with applications. Various parametric effect size from a series of experiments: fixed effect, random effect linear models; combining estimates of correlation coefficients; meta-analysis in the physical and biological sciences. Prereq: STAT 351, 461/661, or 725.

467 Probability and Mathematical Statistics I 3
Random variables, discrete probability distributions, density functions, joint and marginal density functions, transformations, limiting distributions, central limit theorem. Prereq: MATH 265 or STAT 368.

468 Probability and Mathematical Statistics II 3

470/670 Statistical SAS Programming 3
Focuses on statistical problem solving and writing SAS computer code. Data types, data management, data input/output, SAS as a programming language, data analysis, report writing, and graphing. Prereq: STAT 461/661, 462/662, or 726.

472/672 [750] Time Series 3
Estimation of trend in time series data; seasonal models; stationary models; moving average, autoregressive, and ARMA models; model identification; forecasting; and intervention analysis. Prereq: STAT 468 or 768, 461/661, course in matrix algebra.

476 Actuary Exam Study II 1
Selected material from probability and mathematical statistics in preparation for the national actuarial exam. Prereq: STAT 368 or 468.

520 Statistical Methods for Pharmacy 3
Descriptive statistics, life tables, probability, binomial and normal distributions, estimation, hypothesis testing, introduction to regression and ANOVA. Examples from the medical/pharmaceutical area. Prereq: MATH 103 or 107.

725 Applied Statistics 3
Data description, probability, inference on means, proportions, difference of means and proportions, categorical data, regression, analysis of variance, and multiple comparisons. Prereq: Knowledge of algebra. This course is not intended for statistics or mathematics majors.

726 Applied Regression and Analysis of Variance 3
Simple and multiple regression, ANOVA tables, correlation, regression diagnostics, selection procedures, analysis of covariance, one-way ANOVA, two-way ANOVA. Prereq: STAT 725.

730 Biostatistics 3
Direct assays, parallel line assays, slope ratio assays, multiple assays, and quantal assays. Model, estimation, and testing. Probit and logit analysis. Prereq: STAT 461/661 or 725.

732 Introduction to Bioinformatics 3
See Mathematics for description.

761 Advanced Regression 3
Multiple regression, analysis of residuals, model building, regression diagnostics, multicollinearity, robust regression, and nonlinear regression. Prereq: STAT 468 or 768, 461/661, course in matrix algebra.

762 Messy Data Analysis 3

764 Multivariate Methods 3
Sample geometry; correlation; multiple, partial, canonical correlation test of hypothesis on means; multivariate analysis of variance; principal components; factor analysis; and discriminant analysis. Prereq: STAT 461/661 or 462/662, course in matrix algebra.

767 Probability and Mathematical Statistics I 3
Random variables, discrete probability distributions, density functions, joint and marginal density functions, transformations, limiting distributions, central limit theorem. Additional project required. Prereq: MATH 265 or STAT 368.

768 Probability and Mathematical Statistics II 3

770 Survival Analysis 3
Basic methodology in the analysis of Censored Data, two basic types of censoring, parametric estimation, nonparametric estimation, and life table methods. Prereq: STAT 768.

772 Computational Statistics 3
Assortment of computational statistics and statistical computing techniques. Specific topics include: random variable generation, optimization and root finding, resampling statistics, Monte Carlo methods, statistical graphics, non-linear and generalized least squares, and the EM algorithm. Prereq: STAT 661 and STAT 768.
Course Descriptions

774 Linear Models I

775 Linear Models II

777 Multivariate Theory
Wishart distribution, distribution of Hotelling’s T-square and Lambda statistics, cluster analysis, correspondence analysis, principal components, factor analysis, discriminant analysis, multidimensional scaling. Prereq: STAT 764.

778 Modern Probability Theory
Probability theory presented from the measure theoretic perspective. Emphasis on various types of convergence and limit theorems. Discussion of random walks, conditional expectations, and martingales. Prereq: STAT 767, MATH 750. Cross-listed with MATH.

780 Asymptotics, Bootstrap, and Other Resampling Plans
Development of large sample and small sample properties of a variety of estimators. Prereq: STAT 768.

786 Advanced Inference
Further discussion of properties of estimators, theory of estimation, and hypotheses testing. Prereq: STAT 768.

THEATRE ARTS (THEA)
Chabora, Horvik, Larew, Lifton, Robkin, Varland

COURSES
101 Department Participation
Fulfillment of various departmental co-curricular obligations. May be repeated.

110 Introduction to Theatre Arts (CCN)
Basic orientation and historical perspective to the art of theatre. Includes the spectrum of dramatic literature, theatrical production, and performance. (ND:HUM)

115 World Film
Study of the development and practice of the art of film and its relationship to the theater emphasizing performance and production angles. (ND:HUM)

161 Acting I (CCN)
Beginning actors are introduced to basic mental and physical performance skills, stage conventions, and scene work. Emphasis on enhancing the student’s spontaneity, articulation, projection, and expansion of physical work. Prereq: THEA 161, 261.

180 Dramatic Literature and Style
Survey of dramatic literature from the 18th century to the present with emphasis on historical and cultural context, production style, and problems inherent in contemporary production. (ND:HUM)

201 Theatre Practicum (CCN)
Participation in various activities connected with the first Little Country Theatre production of current season. May be repeated. Requires cast or crew assignment on the production.

202 Theatre Practicum II
Participation in various activities connected with the second Little Country Theatre production of current season. May be repeated. Requires cast or crew assignment on the production.

203 Theatre Practicum III
Participation in various activities connected with the third Little Country Theatre production of current season. May be repeated. Requires cast or crew assignment on the production.

204 Theatre Practicum IV
Participation in various activities connected with the fourth Little Country Theatre production of current season. May be repeated. Requires cast or crew assignment on the production.

228 Development of Musical Theatre
Introduction to Musical Theatre. Lectures provide historical survey. Weekly labs are devoted to active exploration of representative musical theatre repertoire, resulting in a final showcase. Prereq: THEA 161 and MUSC 162. Cross-listed with MUSC.

240 Production Stage Management
Production stage management of a Little Country Theatre main stage show. May be repeated.

261 Acting II (CCN)
Practical application of fundamental skills to textual work. Prereq: THEA 161.

262 Introduction to Dance
Practicum course expanding the beginning student performer’s physical/kinesthetic awareness. Examines basic styles of dance as employed in theatrical presentation (ballet, modern dance, jazz, and/or tap). Basics in theatre dance audition techniques, and choreography.

263 Dance Studio
Introduction to the basic concepts and principles of ballet, modern, jazz, ballroom, swing, or tap dance through studio experiences. Each semester will focus on one specific style. May be repeated for credit with change in specific style:

265 Script Analysis
Methods and procedures of play script analysis for theatre practitioners. Prereq: THEA 180.

266 Voice and Movement for the Actor
An introduction to the theory and practice of ideal vocal production and physical self-use. Exercises are offered addressing breath control, alignment, relaxation, resonance, articulation, projection, and expansion of physical and vocal creative expression. Prereq: THEA 161.

273 [270] Stagecraft
An introduction to the crafts and technologies of theatre production. Includes fundamentals of scenery construction, tool usage and safety, costume materials and construction. Two 1-hour lectures, one 3-hour laboratory.

274 [375] Introduction to Stage Design
Introduction to theatrical scenery and costume design.

275 Theatrical Makeup Design
Fundamentals of stage makeup; facial analysis and introduction to materials and techniques. Character interpretation through two- and three-dimensional application.

280 World Theatre
Survey of the theatre and drama of various European and non-Western cultures. (ND:HUM)

286 Theatrical Design Studio I: Collaboration and Concept
Intermediate study, studio practice and critique. Application of standard processes for theatrical design and collaboration.

287 Theatrical Design Studio II: Materials and Techniques for Design
Intermediate study, studio practice and critique. Specialization in materials and design of theory and process.

301 Musical Theatre Troupe
A select performance ensemble of 12-16 students. Students will develop and present scenes, songs, and choreography from contemporary musical theatre productions. By audition and permission of instructor. May be repeated.

350 Studio Theatre
1-2 Workshops in specialized techniques or a showcase for individual creativity. Includes projects in acting, directing, design, movement, and play writing. May be repeated.

361 Acting III: Advanced Realism
Advanced studies in realistic acting technique and scene work. Course open to student with BFA-standing only. Prereq: THEA 161, 261.

362 Dance Styles for Theatre
Integration of beginning dance techniques in the standard theatre dance repertoire through studio experiences. Prereq: THEA 262.

365 Directing I
Introduction to the creative process of directing. Focus on script analysis, basic directing tools, and scene work. Prereq: THEA 261.

366 [468] Business of Acting
Advanced study in business of acting, addressing resume/portfolio, photos, audition package/interviews, agents, unions, graduate programs, national theatre organizations, and audition resources. Prereq: BFA Standing, THEA 261, 266.

370 Technical Theatre Production
Advanced study in technical theatre production. Emphasis on planning processes and individual duties/responsibilities for technicians at all levels of theatrical production. 2 lectures, 1 three-hour laboratory. Prereq: THEA 270, 271. May be repeated.

372 Stage Management
Fundamentals of production stage management. Emphasis on the role, duties, and relationships of the stage manager as a member of the production team.

381 Technical Theatre Seminar
A detailed study into the different technologies and processes involved in the technical areas of theatrical production. Each class will involve concentrated study in one category of technical production skills. May be repeated for credit with change in subtopic.
TRANSPORTATION and LOGISTICS (TL)

Bilen-Green, Lambert, Tolliver, Traub, Varma

189 Skills for Academic Success

Development of skills and techniques for academic success. Includes study techniques, time management, test taking, note taking, goal setting, wellness, stress management, and career orientation. Introduction to campus resources and governance. Repeated course opportunity exists for failing grades only. Cross-listed with ABEN, AGR1, BUSN, HD&E, and ME. F,S
402 Power of Narrative 3
Examination of the power of narrative in family stories from the viewpoint of literature, anthropology, and family studies. Exploration of the formation and basis for individual, family, and cultural identity through stories.

403 Weighing the Evidence 3
Examination of evidence from a variety of viewpoints representing different academic disciplines and vocations. Incorporation of a broader perspective in increasingly complex situations.

404 Spatial Conflicts in Global Society 3
Exploration of the utilization of space and spatial harmony and conflict on a personal, local, national, and global basis through readings, up-to-date news coverage, and recent films. Includes a spectrum of critical issues.

405 Problems of World Hunger: An Integrated Approach 3
Exploration of multiple dimensions of hunger from a variety of academic and international perspectives: geographic, political, economic, agricultural, nutritional/health, and social/cultural.

489 Capstone Experience 1
The Capstone Experience for a Bachelor of University Studies degree consists of a reflective paper designed to provide the student with the opportunity to integrate, synthesize and apply the cumulative academic experience. Course includes professional skills, and a brief oral presentation. Pass/Fail grading only. F, S

VETERINARY SCIENCE (VETS)
Buchanan, Head; Berryhill, Colville, Wagner

COURSES

115 Medical Terminology for the Paraprofessional 1
Medical terminology explored through a systematic study of word parts and the combinations used to build medical terms.

125 Animal Restraint 2
Study of behavioral characteristics and handling techniques of farm, companion, and laboratory animals.

130 Companion Animal Breeds 1
History, development, uses, characteristics, and genetic predispositions of dogs, cats, horses, goats, birds, and laboratory animals. General terms associated with each species, and pertinent color patterns.

135 Anatomy and Physiology of Domestic Animals 3
Introduction to the anatomy and physiology of common domestic mammals. Emphasis on how the body’s normal structures and functions contribute to health.

136 Anatomy and Physiology Laboratory 1
To accompany VETS 135.

150 Introduction to the Veterinary Profession 1
Exploration of the many educational and career opportunities in veterinary medicine available to both veterinarians and veterinary technicians.

(These courses are restricted to Veterinary Technology majors only.)

255 Fundamentals of Veterinary Radiography 3
Diagnostic radiograph production including X-ray machine operation, dark room procedures, radiographic positioning, and radiation safety.

256 Veterinary Clinical Techniques and Instruments 4
Clinical procedures and instrumentation used in the day-to-day operation of a veterinary practice.

259 Small Animal Diseases 2
Basic principles of common dog and cat diseases with emphasis on client education.

357 Veterinary Pharmacology 3
Study of drugs used in veterinary medicine with particular emphasis on commonly used drug groups.

358 Veterinary Surgical Nursing Techniques 4
Preparation for and assistance with veterinary surgical procedures. Provision of proper aftercare for veterinary surgical patients.

359 Veterinary Hospital Information and Procedures 2
Principles of veterinary hospital management and client relations/education.

385 Veterinary Clinical Pathology I 3
Study of hematology principles and procedures commonly utilized in veterinary medicine.

386 Veterinary Clinical Pathology II 3
Study of urine analysis and serum chemistry principles and procedures commonly utilized in veterinary medicine.

387 Veterinary Clinical Pathology III 3
Study of parasitology principles and procedures commonly utilized in veterinary medicine.

440 Zoonoses 3
Characteristics of diseases transmissible between animals and humans. Prereq: MICR 202 or 350.

481 Ward Care/Clinic Care 1
Supervised experience managing the care and feeding of Veterinary Technology Program animals and clinical veterinary facilities. May be repeated 4 times.

482 Large Animal Techniques 3
Handling, restraint, nursing, and management techniques used in large animal veterinary practice. Primarily focused on cattle and horses. Prereq: VETS 256.

483 Clinical Veterinary Practicum 1-3
Supervised experience applying veterinary diagnostic and therapeutic techniques and procedures in a clinical setting. May be repeated with instructor approval.

485 Veterinary Technology Externship 6-12
Capstone experience for veterinary technology students. Continued development of skills through supervised work in a veterinary practice or other appropriate clinical setting. Refer to Animal Science for information regarding Veterinary Technology program.

WOMEN’S STUDIES (WS)
Burnett

COURSES

110 Introduction to Women’s Studies 3
Exploration of a range of social/domestic and global issues related to women; development of a feminist framework for thinking and writing about woman and gender. (ND:HUM)

350 Perspectives in Women’s Studies 3
Exploration of women and gender from many perspectives. Course provides an opportunity to increase knowledge of the scholarship and writings in Women’s Studies, including authors such as Friedan, Baumgardner and Richards, Wolf, and Roiphe. Recommended: WS 110.

489 Internship/Capstone 3
Integrate coursework taken in Women’s Studies major; apply knowledge to women’s events and experiences; explore career and graduate options in the field of Women’s Studies.

ZOOLoGY (ZOO)
(See Biological Sciences.)
State Board of Higher Education

Created by constitutional amendment in 1939, the State Board of Higher Education is the governing body of North Dakota State University and all other state supported institutions of higher education in North Dakota. The board’s chief executive officer is the chancellor of the North Dakota University System, with offices in the state capital in Bismarck.

Officers of Agencies Associated with the University

Kenneth Bertsch, B.S., Commissioner, State Seed Department
Timothy Flakoll, M.S., Provost, Tri-College University
Gene C. Griffin, M.S., Director, Upper Great Plains Transportation Institute
Tony Grindberg, Executive Director, Research Technology Park, Inc.
William P. Kemp, Ph.D., Director, Red River Valley Agricultural Research Center
Larry Kotchman, State Forester, North Dakota Forest Services
James C. Miller, M.S., Executive Director, NDSU Alumni Association and Development Foundation
Jon Skaare, M.S., Director, North Dakota Center for Distance Education
Brian Sorenson, M.S., Director, Northern Crops Institute
Kathleen Tweeten, M.B.A., Director, Center for Community Vitality and Institute for Business and Industry Development

Administration

Joseph A. Chapman, Ph.D., President
Eveadean Myers, J.D., Executive Director, Chief Diversity Officer
Rick D. Johnson, J.D., General Counsel
Gene Taylor, M.S., Director, Athletics
R. Craig Schnell, Ph.D., Provost and Vice President for Academic Affairs
Kenneth Girafon, Ph.D., Dean of the College of Agriculture, Food Systems, and Natural Resources
Thomas J. Riley, Ph.D., Dean of the College of Arts, Humanities and Social Sciences
Ronald Johnson, Ph.D., Dean of the College of Business
Gary Smith, Ph.D., Dean of the College of Engineering and Architecture
Virginia L. Clark Johnson, Ph.D., Dean of the College of Human Development and Education
Charles D. Peterson, Pharm.D., Dean of the College of Pharmacy, Nursing, and Allied Sciences
Kevin McCaul, Ph.D., Dean of the College of Science and Mathematics
David Wittrock, Ph.D., Dean of the College of Graduate School

Carolyn Schnell, Ed.D., Associate Dean of the College of University Studies
Michele Reid, M.S., Dean of Libraries
Kerri Spiering, Ph.D., Director of International Programs
Gene C. Griffin, M.S., Director of Upper Great Plains Transportation Institute
R. S. Krishnan, Ph.D., Associate Vice President for Academic Affairs and Director of Summer School
Lisa Nordick, M.S., Assistant Dean and Director of Distance Continuing Education and Group Decision Center
Sudhir Mehta, Associate Vice President for Academic Affairs, International
William Slager, Ph.D., Director of Institutional Research and Analysis
Robert Harrold, Ph.D., Director of Accreditation and Assessment

D. C. Coston, Ph.D., Vice President for Agriculture and University Extension
Kenneth F. Girafon, Ph.D., Director of the N.D. Agricultural Experiment Station and Professor of Plant Sciences
Duane Hauck, M.S., Director of the Extension Service

John C. Adams, M.B.A., Vice President for Finance and Administration
Bros T. Lierz, B.S., Associate Vice President for Finance and Administration
Ray E. Boyer, B.S., Director of University Police and Safety Office
Collette D. Erickson, M.S.A., Associate Director of Human Resources
Tricia R. Johnson, B.S., Associate Director of Payroll
Bruce S. Franz, B.S., Director of Facilities Management
David J. Martin, B.A., Director of Student Loan Service Center
Barry D. Miller, B.S., Manager, Audit & Advisory Services
Kara Mongeon-Stewart, M.B.A., Director of Budget
Gary L. Wavers, M.B.A., Controller
Stacey O. Winter, B.S., Director of Purchasing

Bonnie Neas, M.B.A., Vice President of Information Technology
Jeff Gerst, Ph.D., Associate Vice President and Chief Information Officer, Information Technology
Joan Chapak, B.S., Director, Telecommunications
Jody French, M.S., Director, EduTech
Marc Wallman, Director, IT Infrastructure Services

Philip Boudjouk, Ph.D., Vice President for Research, Creative Activities and Technology Transfer
Gregory J. McCarthy, Associate Vice President, Interdisciplinary Research/CNSE/CATT
Valrey V. Kettner, J.D., Associate Vice President, Sponsored Programs Administration
Sheri Anderson, M.B.A., Assistant Vice President for Program Development and Operations
Dennis Anderson, M.Sc., Assistant Vice President for Business Development and Industrial Relations
David R. Givers, M.S., Co-Proj-Contractor, ND EPSCoR
Tony Grindberg, Executive Director, Research Technology Park, Inc.
Dale F. Zetocha, M.S., Executive Director, Technology Transfer/Research Foundation

Prakash C. Mathew, M.S., Vice President for Student Affairs
Catherine S. Haugen, Ph.D., Associate Vice President for Student Affairs
Janna M. Stoskopf, M.S., Dean of Student Life
Barbara Lomakina, M.S., R.N., Associate Dean for Student Wellness and Director of Student Health Service
William Burns, Ph.D., Director of Counseling Center

Wendy Clarin, B.A., Manager, Bison Connection/Bison Card Center
Jaclynn Davis-Wallette, M.S., Director of Multicultural Student Services
Vier Q. Doan, B.S., Manager, Enrollment Management Technology Services
John (Jack) Donalase, B.S./B.A., Director of Dining Services
Jeanette Enebo, Director of Student Financial Services
Gary Fisher, M.Ed., Director of the Wellness Center
Michael Harwood, M.S., Director of Residence Life
Vacant, Director of TRIO Programs
Steve Winfrey, M.A., Director of Memorial Union
Bunnie Johnson-Messelt, M.S., Director of Disability Services
Jobey Lichtblau, M.M, Director of Admission
Carol Miller, B.S., Director of NDSU Bookstore
Lauri Oster-Aaland, M.S., Director of Orientation and Student Success
Deanne Sperling, B.S./B.A., Coordinator of University Conference Programs/Assistant to the Vice President for Student Affairs
Jill Wilkey, B.S., Director of the Career Center
Kristi Wold-McCormick, Ph.D., Registrar
Nona L. Wood, M.S.Ed., Associate Director of Student Rights and Responsibilities

Keith Bjerke, B.S., Vice President for University Relations
Lauraj McDaniel, M.S., Assistant Vice President for University Relations
Naja Amundson, M.S., Media Relations Director
Brad Clemenson, B.S., Art Director
Laurie Baker, M.A., Public Relations Director

Journal of International Education and University Extension
Kenneth F. Girafon, Ph.D., Director of the N.D. Agricultural Experiment Station and Professor of Plant Sciences
Duane Hauck, M.S., Director of the Extension Service

John C. Adams, M.B.A., Vice President for Finance and Administration
Bros T. Lierz, B.S., Associate Vice President for Finance and Administration
Ray E. Boyer, B.S., Director of University Police and Safety Office
Collette D. Erickson, M.S.A., Associate Director of Human Resources
Tricia R. Johnson, B.S., Associate Director of Payroll
Bruce S. Franz, B.S., Director of Facilities Management
David J. Martin, B.A., Director of Student Loan Service Center
Barry D. Miller, B.S., Manager, Audit & Advisory Services
Kara Mongeon-Stewart, M.B.A., Director of Budget
Gary L. Wavers, M.B.A., Controller
Stacey O. Winter, B.S., Director of Purchasing

Bonnie Neas, M.B.A., Vice President of Information Technology
Jeff Gerst, Ph.D., Associate Vice President and Chief Information Officer, Information Technology
Joan Chapak, B.S., Director, Telecommunications
Jody French, M.S., Director, EduTech
Marc Wallman, Director, IT Infrastructure Services

Philip Boudjouk, Ph.D., Vice President for Research, Creative Activities and Technology Transfer
Gregory J. McCarthy, Associate Vice President, Interdisciplinary Research/CNSE/CATT
Valrey V. Kettner, J.D., Associate Vice President, Sponsored Programs Administration
Sheri Anderson, M.B.A., Assistant Vice President for Program Development and Operations
Dennis Anderson, M.Sc., Assistant Vice President for Business Development and Industrial Relations
David R. Givers, M.S., Co-Proj-Contractor, ND EPSCoR
Tony Grindberg, Executive Director, Research Technology Park, Inc.
Dale F. Zetocha, M.S., Executive Director, Technology Transfer/Research Foundation

Prakash C. Mathew, M.S., Vice President for Student Affairs
Catherine S. Haugen, Ph.D., Associate Vice President for Student Affairs
Janna M. Stoskopf, M.S., Dean of Student Life
Barbara Lomakina, M.S., R.N., Associate Dean for Student Wellness and Director of Student Health Service
William Burns, Ph.D., Director of Counseling Center

Wendy Clarin, B.A., Manager, Bison Connection/Bison Card Center
Jaclynn Davis-Wallette, M.S., Director of Multicultural Student Services
Vier Q. Doan, B.S., Manager, Enrollment Management Technology Services
John (Jack) Donalase, B.S./B.A., Director of Dining Services
Jeanette Enebo, Director of Student Financial Services
Gary Fisher, M.Ed., Director of the Wellness Center
Michael Harwood, M.S., Director of Residence Life
Vacant, Director of TRIO Programs
Steve Winfrey, M.A., Director of Memorial Union
Bunnie Johnson-Messelt, M.S., Director of Disability Services
Jobey Lichtblau, M.M, Director of Admission
Carol Miller, B.S., Director of NDSU Bookstore
Lauri Oster-Aaland, M.S., Director of Orientation and Student Success
Deanne Sperling, B.S./B.A., Coordinator of University Conference Programs/Assistant to the Vice President for Student Affairs
Jill Wilkey, B.S., Director of the Career Center
Kristi Wold-McCormick, Ph.D., Registrar
Nona L. Wood, M.S.Ed., Associate Director of Student Rights and Responsibilities

Keith Bjerke, B.S., Vice President for University Relations
Lauraj McDaniel, M.S., Assistant Vice President for University Relations
Naja Amundson, M.S., Media Relations Director
Brad Clemenson, B.S., Art Director
Laurie Baker, M.A., Public Relations Director

College of Agriculture, Food Systems, and Natural Resources

Aakre, Dwight G., Farm Management Specialist, Agribusiness and Applied Economics
M.S., 1982, North Dakota State University

Adhkari, Tika B., Assistant Professor of Plant Pathology
Ph.D., 1991, IRRI/UPLB, The University of Philippines

Akyuza, F., Assistant Professor of Soil Science
Ph.D., 1994, University of Missouri-Columbia

Anderson, Albin W., Emeritus Professor of Entomology
Ph.D., 1969, Iowa State University

Anderson, Donald E., Emeritus Professor of Agribusiness and Applied Economics
Ph.D., 1968, University of Minnesota

Anderson, James V., Adjunct Professor of Plant Sciences, USDA
Ph.D., 1990, Virginia Polytechnic Institute

Anderson, Robin, Adjunct Professor of Animal Sciences
Ph.D., 1995, Iowa State University

Anderson, Ronald, Emeritus Professor of Agribusiness and Applied Economics
Ph.D., 1971, Washington State University

Anderson, Vernon L., Adjunct Professor of Animal Sciences
Ph.D., 1998, North Dakota State University

Backer, Leslie F., Associate Professor of Agricultural and Biosystems Engineering, Department Chair
M.S., 1972, North Dakota State University

Backer, Jungo, Research Assistant Professor for the Center for Agriculture, Policy and Trade Studies
M.S., 1971, North Dakota State University

Berglund, Dean A., Research Scientist of Agribusiness and Applied Economics
M.S., 1987, North Dakota State University

Barber, Kevin, Lecturer of Agribusiness and Applied Economics
Ph.D., 2003, University of Illinois at Urbana-Champaign
Gulya, Thomas J., Adjunct Professor of Plant Pathology, USDA Ph.D., 1978, Iowa State University
Gustafson, Cole P., Professor of Agribusiness and Applied Economics Ph.D., 1986, University of Illinois
Gustad, Thomas R., Senior Lecturer of Veterinary and Microbiological Sciences M.S., 1992, North Dakota State University
Haggard, Janice J., Instructor of Veterinary and Microbiological Sciences M.S., 1996, North Dakota State University
Hall, Clifford, Assistant Professor of Cereal and Food Sciences Ph.D., 1996, University of Nebraska
Hammer, Carolyn J., Assistant Professor of Animal Sciences Ph.D., 2002, Iowa State University
Hammond, James J., Professor of Plant Sciences Ph.D., 1969, University of Nebraska
Harland, Gary A., Adjunct Professor of Cereal and Food Sciences, USDA Ph.D., 1987, North Dakota State University
Harris, Marion O., Professor of Entomology Ph.D., 1986, Michigan State University
Harreld, Robert L., Professor of Animal Sciences; Assistant Dean for Academic Programs Ph.D., 1987, Purdue University
Hatterman-Valenti, Harley, Associate Professor of Plant Sciences Ph.D., 1993, Iowa State University
Hauge, Clayton N., Emeritus Professor of Animal Sciences M.S., 1958, North Dakota State University
Hearte, Robert R., Associate Professor of Agribusiness and Applied Economics Ph.D., 1995, University of Minnesota
Helgeson, Delmer L., Emeritus Professor of Agribusiness and Applied Economics Ph.D., 1971, University of Nebraska
Hellevang, Kenneth, Professor of Agricultural and Biosystems Engineering Ph.D., 1989, North Dakota State University
Helms, Theodore C., Professor of Plant Sciences Ph.D., 1986, Iowa State University
Herman, Dale E., Professor of Plant Sciences Ph.D., 1966, Purdue University
Herron, R. Stanley, Professor of Agribusiness and Applied Economics Ph.D., 1975, Duke University
Higgins, Kenneth, Adjunct Professor of Animal and Range Sciences Ph.D., 1980, North Dakota State University
Himring, Harvey J., Emeritus Professor of Agricultural and Biosystems Engineering Ph.D., 1970, Iowa State University
Hofman, Vernon L., Emeritus Professor of Agricultural and Biosystems Engineering M.S., 1969, North Dakota State University
Holland, Neal S., Emeritus Professor of Plant Sciences M.S., 1960, North Dakota State University
Hopkins, David G., Associate Professor of Soil Science Ph.D., 1997, North Dakota State University
Horsley, Richard D., Professor of Plant Sciences Ph.D., 1988, North Dakota State University
Horvath, David P., Adjunct Professor of Plant Sciences, USDA Ph.D., 1993, Michigan State University
Hosford, Robert, Emeritus Professor of Plant Pathology Ph.D., 1965, University of Arizona
Hossain, Khwaja, Adjunct Professor of Plant Sciences Ph.D., 1995, University of Wales
Hovde, John, Adjunct Professor of Animal Sciences B.S., 1969, North Dakota State University
Howatt, Kirk A., Associate Professor of Plant Sciences Ph.D., 1999, Colorado State University
Hughes, Harlan, Emeritus Professor of Agribusiness and Applied Economics Ph.D., 1971, University of Missouri
Hulke, Brent S., Adjunct Professor of Plant Sciences, USDA Ph.D., 2007, University of Minnesota
Jarsky, Stefan T., Adjunct Professor of Entomology Ph.D., 1978, Cornell University
Jauhar, P.P., Adjunct Professor of Plant Sciences, USDA Ph.D., 1963, Indian Agricultural Institute, New Delhi, India
Jia, Xinhua, Assistant Professor of Agricultural and Biosystems Engineering Ph.D., 2004, University of Arizona
Johnson, Brian E., Research Associate in Soil Science M.S., 1985, North Dakota State University
Johnson, Burton L., Associate Professor of Plant Sciences Ph.D., 1993, North Dakota State University
Johnson, Cutter W., Emeritus Professor of Agricultural and Biosystems Engineering Ph.D., 1983, Oregon State University
Johnson, Jerome E., Emeritus Professor of Agribusiness and Applied Economics Ph.D., 1970, University of Minnesota
Johnson, LaDon J., Emeritus Professor of Animal Sciences Ph.D., 1965, Ohio State University
Johnson, Mary Lynn, Adjunct Professor of Animal Sciences Ph.D., 1995, North Dakota State University
Johnson, Robert L., Emeritus Professor of Animal Sciences Ph.D., 1985, Iowa State University
Johnson, Roger G., Emeritus Professor of Agribusiness and Applied Economics Ph.D., 1962, University of Minnesota
Kalb, Thomas J., Extension Horticulture Specialist Ph.D., 1988, Virginia Polytechnic Institute & State University
Kandel, Herman J., Associate Professor of Plant Sciences Ph.D., 1995, North Dakota State University
Kangas, Michael, Forest Health Specialist of Plant Pathology M.S., 2002, Oregon State University
Khairs, Mazaras L., Assistant Professor of Veterinary and Microbiological Sciences Ph.D., 1999, The Ohio State University
Khan, Khalid, Professor of Cereal and Food Sciences Ph.D., 1977, University of Manitoba, Canada
Khan, Mohamed, Associate Professor of Plant Pathology Ph.D., 1998, Clemson University
Kianian, Shahryar, Associate Professor of Plant Sciences Ph.D., 1990, University of California - Davis
Kiesling, Richard L., Emeritus Professor of Plant Pathology Ph.D., 1952, University of Wisconsin
Kim, Hyun Seok, Research Assistant Professor of Agribusiness and Applied Economics Ph.D., 2008, Oklahoma State University
Kinetz, Kent, Plant Pest Diagnostician, Plant Pathology M.S., 1996, University of Minnesota
Kirby, Donald R., Professor of Range Science; Director, School of Natural Resource Sciences Ph.D., 1980, Texas A&M University
Klotz, Karen L., Adjunct Professor of Plant Sciences, USDA Ph.D., 1995, Ohio State University
Knudel, Janet J., Assistant Professor of Entomology Ph.D., 2005, North Dakota State University
Koch, Kim, B., Adjunct Professor of Animal Sciences Ph.D., 1990, Kansas State University
Koo, Won W., Professor of Agribusiness and Applied Economics; Director of the Center for Agriculture, Policy, and Trade Studies Ph.D., 1974, Iowa State University
Kretzky, Craig, Lecturer of Agribusiness and Applied Economics Ph.D., 2008, North Dakota State University
Krupinsky, Joseph M., Adjunct Professor of Plant Pathology, USDA Ph.D., 1977, Montana State University
Kuca, Henry L., Emeritus Professor of Agricultural and Biosystems Engineering M.S., 1959, North Dakota State University
Kwon, Da-Eun, Research Assistant Professor for the Center for Agriculture Policy and Trade Studies Ph.D., 2007, Texas A&M University
Lambert, David K., Professor of Agribusiness and Applied Economics Ph.D., 1985, Oregon State University
Lamey, H. Arthur, Emeritus Professor of Plant Pathology Ph.D., 1954, University of Wisconsin
Landy, Gregory P., Associate Professor of Animal Sciences Ph.D., 1997, University of Nebraska
Laschewitsch, Barbara A., Research Specialist in Plant Sciences M.S., 2000, North Dakota State University
Lee, Chwirun W., Professor of Plant Sciences Ph.D., 1977, Purdue University
Leitritz, F. Larry, Professor of Agribusiness and Applied Economics Ph.D., 1970, University of Nebraska
Leitch, Jay H., Professor of Natural Resources Ph.D., 1981, University of Minnesota
Leopold, Roger A., Adjunct Professor of Entomology Ph.D., 1967, Montana State University
Li, Deying M., Assistant Professor of Plant Sciences Ph.D., 2001, Iowa State University
Liebig, Mark, Adjunct Professor of Soil Science Ph.D., 1998, University of Nebraska
Lim, Siew Hoon, Assistant Professor of Agribusiness and Applied Economics Ph.D., 2005, University of Georgia
Lindgren, Jon G., Emeritus Professor of Agribusiness and Applied Economics Ph.D., 1968, University of Missouri
Lindley, James A., Emeritus Associate Professor of Agricultural and Biosystems Engineering Ph.D., 1972, Purdue University
Logue, Catherine M., Associate Professor of Veterinary and Microbiological Sciences Ph.D., 1996, University of Ulsan at Jordanstown, United Kingdom
Lorenz, Russell L., Adjunct Professor of Animal and Range Sciences Ph.D., 1970, North Dakota State University
Lulai, Edward C., Adjunct Professor of Plant Sciences, USDA Ph.D., 1978, North Dakota State University
Lund, H. Rosal, Emeritus Professor of Plant Sciences Ph.D., 1965, Purdue University
Lundstrom, Darnell R., Emeritus Professor of Agricultural and Biosystems Engineering Ph.D., 1988, North Dakota State University
Luther, Justin S., Assistant Professor of Animal Sciences Ph.D., 2006, North Dakota State University
Lynn, Rodney G., Interim Chair of Soil Science and Professor of Plant Sciences Ph.D., 1979, University of Wyoming
Maa, Shuvchran S., Emeritus Professor of Plant Sciences Ph.D., 1961, Kansas State University
Macciaiardi, Raul, Adjunct Professor of Plant Sciences Ph.D., 1992, Pennsylvania State University
Mack, Lawrence E., Lecturer of Agribusiness and Applied Economics Ph.D., 1989, University of Arizona
MacRae, Ian V., Adjunct Professor of Entomology Ph.D., 1994, Oregon State University
Maddock-carlin, Kasey R., Assistant Professor of Animal Sciences Ph.D., 2005, Iowa State University
Maddock, Robert J., Associate Professor of Animal Sciences Ph.D., 2000, Texas A&M University
Manthey, Frank A., Associate Professor of Plant Sciences Ph.D., 1985, North Dakota State University
Marchello, Martin J., Emeritus Professor of Animal Sciences Ph.D., 1968, Virginia Polytechnic Institute and State University
Markell, Samuel G., Assistant Professor of Plant Pathology Ph.D., 2007, University of Arkansas

McBride, Dean K., Emeritus Professor of Entomology M.S., 1965, North Dakota State University

McClean, Phillip E., Professor of Plant Sciences Ph.D., 1982, Colorado State University

McDonald, Clarence L., Emeritus Professor of Cereal Science Ph.D., 1957, Purdue University

McDonald, Hugh J., Emeritus Professor of Agribusiness and Applied Economics Ph.D., 1969, Ohio State University - Columbus

McDonald, Ian C., Adjunct Professor of Entomology, USDA Ph.D., 1968, Virginia Polytechnic Institute and State University

McEvoy, John, Assistant Professor of Veterinary and Microbiological Sciences Ph.D., 2002, University of Ulster, Jordanstown Co., Antrim, Northern Ireland

McKee, Gregory, Assistant Professor of Agribusiness and Applied Economics and Director of Qcettin Burdick Center for Cooperatives Ph.D., 2006, University of California - Davis

McMullen, Marcia P., Professor of Plant Pathology Ph.D., 1983, North Dakota State University

McMullen, Michael S., Associate Professor of Plant Sciences Ph.D., 1976, University of Minnesota

Meinhart, Steven, Associate Professor of Plant Pathology Ph.D., 1984, University of Illinois, Urbana - Champaign

Mergoum, Mohamed, Associate Professor of Plant Sciences Ph.D., 1991, Colorado State University

Merrill, Stephen D., Adjunct Professor of Soil Science Ph.D., 1976, University of California - Riverside

Meserumith, Calvin G., Emeritus Professor of Plant Sciences Ph.D., 1970, North Dakota State University

Meyer, Dwain W., Professor of Plant Sciences; Interim Chair Ph.D., 1970, Iowa State University

Müller, Dragan, Professor of Agribusiness and Applied Economics Ph.D., 1996, University of Illinois

Miller, James D., Emeritus Adjunct Professor of Plant Pathology, USDA Ph.D., 1971, North Dakota State University

Moilanen, Charles W., Emeritus Professor of Agricultural and Biosystems Engineering M.S., 1963, North Dakota State University

Moore, Bert L., Associate Professor of Animal Sciences Ph.D., 1975, North Dakota State University

Mrazghan, John T., Emeritus Professor of Soil Science Ph.D., 1961, Iowa State University

Myers, Deland, Professor and Director, School of Food Systems and Director; Great Plains Institute of Food Safety Ph.D., 1985, Iowa State University

Nalley, John D., Emeritus Professor of Plant Sciences Ph.D., 1982, University of Minnesota

Neate, Stephen M., Professor of Plant Pathology Ph.D., 1985, University of Adelaide

Nelson, Berlin D., Jr., Professor of Plant Pathology Ph.D., 1979, Washington State University

Nelson, Donald C., Emeritus Professor of Plant Sciences Ph.D., 1961, University of Minnesota

Nelson, William C., Emeritus Professor of Agribusiness and Applied Economics Ph.D., 1971, Ohio State University

Newman, David J., Extension Swine Specialist B.S., 2005, University of Missouri-Columbia

Nichols, Kristine, Adjunct Professor of Soil Science Ph.D., 2003, University of Maryland

Norland, Jack, Assistant Professor of Natural Resources Management Ph.D., 2008, North Dakota State University

Nowatzki, John F., Ag Machine Systems Specialist, Agricultural and Biosystems Engineering M.S., 1974, North Dakota State University

Nyrén, Paul E., Adjunct Professor of Animal and Range Sciences M.S., 1975, Washington State University

Nytnuin, Peter A., Emeritus Associate Dean of Agriculture M.S., 1956, North Dakota State University

Ohm, Jac-Bon, Adjunct Professor of Cereal and Food Sciences Ph.D., 1996, Kansas State University

Olson, Denise L., Adjunct Professor of Entomology Ph.D., 1994, Kansas State University

Olson, Frayne, Assistant Professor of Agribusiness and Applied Economics Ph.D., 2007, University of Missouri

O’Reiley, Z. Edward, C.P.A., C.M.A., Ph.D., Emeritus Professor of Agribusiness and Applied Economics Ph.D., 1972, University of Toulouse

Oommen, Juan, Assistant Professor of Plant Sciences Ph.D., 2006, North Dakota State University

O’Rourke, Katherine, Adjunct Professor of Animal and Range Sciences Ph.D., 1987, Washington State University

Ortiz, Carlos E., Adjunct Professor of Plant Sciences Ph.D., 1993, University of Arkansas

Ostenson, Thomas K., Emeritus Professor of Agribusiness and Applied Economics M.S., 1966, North Dakota State University

Overstreet, Laura F., Assistant Professor of Soil Science Ph.D., 2005, North Carolina State University

Panigrahi, Suranjan, Professor of Agricultural and Biosystems Engineering Ph.D., 1992, Iowa State University

Park, Chung S., Professor of Animal Sciences Ph.D., 1975, Virginia Polytechnic Institute and State University

Petty, Timothy A., Associate Professor of Agribusiness and Applied Economics M.S., 1973, North Dakota State University

Porch, Timothy, Adjunct Professor of Plant Sciences Ph.D., 2001, Cornell University

Pratt, George L., Emeritus Professor of Agricultural and Biosystems Engineering Ph.D., 1947, Oklahoma State University

Prisching, Dietleif A., Assistant Professor of Entomology Ph.D., 2005, Washington State University

Prüß, Birgit, Assistant Professor of Veterinary and Microbiological Sciences Ph.D., 1991, Institute für Physiologische Chemie, Ruhr-Universität, Bochum Germany

Prunty, Lyle D., Professor of Soil Science Ph.D., 1978, Iowa State University

Pryor, Scott W., Assistant Professor of Agricultural and Biosystems Engineering Ph.D., 2005, Cornell University

Rahman, Shafiqur, Assistant Professor of Agricultural and Biosystems Engineering Ph.D., 2004, University of Manitoba

Ransorn, Joel K., Associate Professor of Plant Sciences Ph.D., 1982, University of Minnesota

Rasmussen, Jack B., Professor of Plant Pathology; Department Chair, Plant Pathology Ph.D., 1987, Michigan State University

Rathge, Richard W., Professor of Sociology and Agribusiness and Applied Economics Ph.D., 1981, Michigan State University

Redmer, Dale A., Professor of Animal Sciences Ph.D., 1983, University of Missouri-Columbia

Reff, Tommy L., Emeritus Professor of Agribusiness and Applied Economics M.S., 1968, North Dakota State University

Reinhiller, Merrill J., Adjunct Professor of Veterinary and Microbiological Sciences D.V.M., 1969, Iowa State University

Rengifo, Judith, Research Assistant of Plant Pathology M.S., 2003, University of Puerto Rico

Reynolds, Lawrence P., Professor of Animal Sciences Ph.D., 1983, Iowa State University

Rice, Billy B., Emeritus Professor of Agribusiness and Applied Economics M.S., 1965, North Dakota State University

Richman, Rachel L., Lecturer of Veterinary and Microbiological Sciences M.S., 2002, University of Minnesota

Rider, David A., Professor of Entomology Ph.D., 1988, Louisiana State University

Riemann, John G., Adjunct Professor of Entomology; USDA Ph.D., 1961, University of Texas

Rinehart, Joseph, Adjunct Professor of Entomology Ph.D., 1999, The Ohio State University

Ringwall, Kris A., Associate Professor of Animal Sciences Ph.D., 1985, Oklahoma State University

Rivera, Viviana V., Research Assistant of Plant Pathology M.S., 2000, North Dakota State University

Roehrdanz, Richard, Adjunct Professor of Entomology Ph.D., 1974, University of Wisconsin - Madison

Sadowsky, David M., Associate Professor of Agribusiness and Applied Economics J.D., 1979, Ohio State University

Schauer, Christopher S., Adjunct Professor of Animal Sciences Director, Her+tinger Research Extension Center Ph.D., 2003, Oregon State University

Scherer, Thomas, Associate Professor of Agricultural and Biosystems Engineering Ph.D., 1986, University of Minnesota

Schollfjäger, Eric J., Adjunct Professor of Animal Sciences Ph.D., 2005, University of Wyoming

Schoeder, Jerome (J.W.), Associate Professor of Animal Sciences Ph.D., 1999, North Dakota State University

Schuh, Jane, Assistant Professor of Veterinary and Microbiological Sciences Ph.D., 2000, North Dakota State University

Schwarz, Paul B., Professor of Plant Sciences Ph.D., 1987, North Dakota State University

Secor, Gary A., Professor of Plant Pathology Ph.D., 1978, University of California - Davis

Sediver, Kevin K., Associate Professor of Range Sciences Ph.D., 1994, North Dakota State University

Seiler, Gerald J., Adjunct Professor of Plant Sciences, USDA Ph.D., 1980, North Dakota State University

Shaik, Saleem, Assistant Professor of Agribusiness and Applied Economics Ph.D., 1998, University of Nebraska-Lincoln

Simsek, Senay, Assistant Professor of Plant Sciences Ph.D., 2006, Purdue University

Slenger, William D., Professor of Animal Sciences; Director of Institutional Research and Analysis Ph.D., 1975, Cornell University

Slepet, Bayard P., Emeritus Professor of Veterinary and Microbiological Sciences Ph.D., 1951, University of California

Smith, David J., Adjunct Professor of Animal Sciences Ph.D., 1990, Washington State University

Smith, M. Herbert, Emeritus Professor of Veterinary and Microbiological Sciences D.V.M., 1962, University of Minnesota Ph.D., 1974, Iowa State University

Smith, Ronald C., Professor of Plant Sciences Ph.D., 1973, The Ohio State University

Solberg, Elton G., Instructor of Agricultural and Biosystems Engineering M.S., 1988, North Dakota State University

Sowokinos, Joseph R., Adjunct Professor of Plant Sciences; USDA Ph.D., 1969, University of North Dakota

Spidle, LeRoy A., Emeritus Associate Professor of Plant Sciences Ph.D., 1975, North Dakota State University

Stachler, Jeff M., Assistant Professor of Plant Sciences Ph.D., 2008, The Ohio State University

Stack, Robert W., Emeritus Professor of Plant Pathology Ph.D., 1976, Cornell University
N. D. Agricultural Experiment Station/Research Extension Centers

Abel, Ezra A., Research Specialist/Agronomy, Carrington Research Extension Center
Ph.D., 2002, Iowa State University

Albus, Walter, Research Agronomist, Oakes Irrigation Research Site
M.S., 1977, North Dakota State University

Anderson, Chad D., Seed Production Specialist, North Central Research Extension Center, Minot
M.S., 2003, North Dakota State University

Anderson, Vernon L., Animal Scientist, Carrington Research Extension Center, and Adjunct Professor, Animal Sciences
Ph.D., 1999, North Dakota State University

Bergman, Jerald, Director/Agronomist, Williston Research Extension Center
Ph.D., 1972, North Dakota State University

Bradbury, Gordon, Research Specialist, Williston Research Extension Center
B.S., 1974, North Dakota State University

Bradbury, Lorna, Research Specialist, Williston Research Extension Center
B.S., 2002, University of Regina

Carr, Patrick M., Agronomist, Dickinson Research Extension Center and Adjunct Professor of Plant Sciences
Ph.D., 1989, Montana State University

Copenhaver, David, Research Specialist/Seedstocks, Carrington Research Extension Center
B.S., 1985, North Dakota State University

Dong, Xiejun, Assistant Range Scientist, Central Grasslands Research Extension Center
Ph.D., 1997, Chinese Academy of Sciences

Eriksson, Eric D., Associate Agronomist, Hettinger Research Extension Center
M.S., 1988, North Dakota State University

Faller, Timothy C., Assistant Director, N.D. Agricultural Experiment Station, Bismarck
M.S., 1975, North Dakota State University

Fisher, Jon Jay, Director/Agronomist, North Central Research Extension Center, Minot
M.S., 1977, North Dakota State University

Gezari, Amanda, Range Research Technician, Hettinger Research Extension Center
M.S., 2005, University of Idaho

Grafton, Kenneth F., Dean of the College of Agriculture, Food Systems, and Natural Resources and Director of the N.D. Agricultural Experiment Station
Ph.D., 1980, University of Missouri

Halley, Scott, Crop Protection Scientist, Langdon Research Extension Center
M.S., 2000, North Dakota State University

Halvorson, Mark A., Agronomist, North Central Research Extension Center, Minot
M.S., 1995, North Dakota State University

Hansen, Bryan K., Agronomist, Langdon Research Extension Center
M.S., 1983, Oklahoma State University

Hendrickson, Paul F., Research Specialist/Agronomy, Carrington Research Extension Center
M.S., 1998, Oregon State University

Ille, Brena, Research Specialist/Livestock, Carrington Research Extension Center
B.S., 2005, Montana State University

Jenks, Brian M., Weed Scientist, North Central Research Extension Center, Minot
Ph.D., 1995, University of Nebraska

Landblom, Douglas G., Associate Research Specialist, Dickinson Research Extension Center
M.S., 1972, Montana State University

Lukach, John R., Agronomist, Langdon Research Extension Center
M.S., 1983, North Dakota State University

Marske, Llewellyn L., Range Scientist, Dickinson Research Extension Center
Ph.D., 1980, North Dakota State University

Manz, Gregory, Assistant Animal Scientist, Central Grasslands Research Extension Center, Streeter
Ph.D., 2008, Utah State University

Mazurek, Shanna, Research Specialist, North Central Research Extension Center, Minot
B.A., 2005, Minot State University

Mehlhauff, Randy T., Director/Agricultural Economist, Langdon Research Extension Center
M.S., 1993, North Dakota State University

Nuddal, Daniel J., Assistant Agricultural Economist, Hettinger Research Extension Center
M.S., 1998, North Dakota State University

Nyren, Paul E., Director/Range Scientist, Central Grasslands Research Extension Center, Streeter, and Adjunct Professor of Animal and Range Science
M.S., 1975, Washington State University

Olson, Howard M., Emeritus Director, Carrington Research Extension Center
M.S., 1950, Utah State University

Patton, Bob D., Associate Range Scientist, Central Grasslands Research Extension Center, Streeter
M.S., 1986, University of Idaho

Pederson, Shana, Assistant Pulse Crop Breeder, North Central Research Extension Center, Minot
M.S., 2002, North Dakota State University

Qvale, Sanford, Seed Production Specialist, Williston Research Extension Center
B.S., 1975, North Dakota State University

Ringwall, Kris A., Director/Animal Scientist, Dickinson Research Extension Center and Associate Professor, Animal Sciences
Ph.D., 1985, Oklahoma State University

Riveland, Neil R., Agronomist, Williston Research Extension Center
M.S., 1969, North Dakota State University

Scharf, Blaine G., Director/Agronomist, Carrington Research Extension Center
M.S., 1988, North Dakota State University
Schauer, Christopher S., Director/animal and Range Scientist, Hettinger Research Extension Center Ph.D., 2003, Oregon State University

Sebelius, Angela E., Research Specialist, North Central Research Extension Center, Minot M.S., 2007, North Dakota State University

Statkew, James A., Soil Scientist, Williston Research Extension Center Ph.D., 1990, University of Minnesota

Stecher, Donald M., Research Specialist, Hettinger Research Extension Center B.S., 1983, North Dakota State University

Tarsen, James, Research Specialist, North Central Research Extension Center, Minot

Teigen, Thomas L., Director/Agronomist, Agronomy Seed Farm, Casehton M.S., 1975, North Dakota State University

Thompson, Michele M., Assistant Animal Scientist, Hettinger Research Extension Center M.S., 1992, Oregon State University

Tjelde, Tyler, Irrigation Research Specialist, Williston Research Extension Center B.S., 2003, North Dakota State University

Wiederholt, Ron, Nutrient Management Specialist, Carrington Research Extension Center M.S., 1995, University of Wisconsin-Madison

Willoughby, Gary P., Research Specialist, North Central Research Extension Center, Minot B.A., 1993, Minot State University

Zwinger, Steve F., Research Specialist/Agronomy, Carrington Research Extension Center B.S., 1982, North Dakota State University

NDSU Extension Service Administration/State Specialists

[See College of Agriculture, Food Systems, and Natural Resources, and College of Human Development and Education sections for additional Extension faculty listings.]

Bollinger, Bruce A., Extension Administration M.B.A., 1995, North Dakota State University

Cogdill, Bradley D., Extension Administration M.S., 2004, North Dakota State University

Crawford, Ellen, Specialist, Agriculture Communication B.S., 1976, Minnesota State University Moorhead

Egeberg, Roger D., Specialist, Agriculture Communication B.S., 1974, North Dakota State University

Fisher, Jon Jay, Extension Administration M.S., 1977, North Dakota State University

Flagge, Lynette J., Specialist, Center for Community Vitality M.Ed., 2004, North Dakota State University

Gebeke, Deb R., Extension Administration Ph.D., 1996, University of North Dakota

Hanson, Michael E., Extension Administration B.S., 1980, North Dakota State University

Hauck, Duane D., Extension Administration M.S., 1983, North Dakota State University

Haugen, Roger G., Extension Administration M.S., 1970, Iowa State University

Hochhalter, Scott A., Specialist, Soil Conservation B.S., 1988, North Dakota State University

Hvidsten, Marie G., Specialist, Rural Leadership Ph.D., 2007, University of St Thomas

Koch, Becky, Specialist, Agriculture Communication M.S., 1986, Kansas State University

Kurka, Frank J., Specialist, Sustainable Agriculture Ph.D., 2005, Cornell University

Mattern, Richard A., Specialist, Agriculture Communication M.S., 1994, North Dakota State University

Peterson, Lisa, Beef Quality Assurance Specialist B.S., 1997, Cal State University

Sturm, Gerald M., Extension Administration M.S., 1986, North Dakota State University

Sun, Bruce W., Specialist, Agriculture Communication B.A., 1984, University of North Dakota

Tweten, Margaret, Grand Forks, Extension Administration Ph.D., 2008, University of North Dakota

Wiederholt, Ron, Nutrient Management Specialist M.S., 1995, University of Wisconsin - Madison

Area Agents/Area Specialists

Ashley, Roger, Extension Area Specialist M.S., 1989, University of Arizona, Tucson

Augstein, Christopher, Extension Area Specialist B.S., 2005, North Dakota State University

Berge, Angela, Extension Agent and Parenting Resources Coordinator M.S., 1990, North Dakota State University

Dhyver, John M., Extension Area Specialist M.S., 1984, Oklahoma State University

Dvorak, Teresa A., Extension Area Specialist B.S., 2000, University of Wisconsin

Endres, Gregory J., Extension Area Specialist M.S., 1993, North Dakota State University

Hill, Chester L., Extension Area Specialist M.S., 1993, North Dakota State University

Hoppe, Karl F., Extension Area Specialist Ph.D., 1990, South Dakota State University

Jenks, Brian M., Extension Area Specialist Ph.D., 1996, University of Nebraska - Lincoln

Konnerz, Judith, Extension Agent and Parenting Resources Coordinator M.S., 2002, University of North Dakota

Laine, Michael O., Irrigation Agent B.S., 1979, North Dakota State University

Makle, Denise, Extension Area Specialist M.S., 1999, North Dakota State University

Pederson, Jeremy, Extension Area Specialist M.S., 2002, North Dakota State University

Radke, Nadine, Extension Area Specialist B.S., 2006, South Dakota School of Mines and Technology

Radke, Rudolph, Extension Area Specialist B.S., 1971, North Dakota State University

Schmalz, Kathleen M., Extension Agent and Parenting Resources Coordinator B.S., 1987, North Dakota State University

Theurer, Debra L., Extension Agent and Parenting Resources Coordinator B.S., 1980, Dickinson State University

Extension Agents

Anderson, Donna F., Foster and Eddy B.S., 1992, North Dakota State University

Anderson, Kaylyn M., LaMoure B.S., 1975, North Dakota State University

Anderson, Peggy, Burke and Divide B.S., 1980, North Dakota State University

Armstrong, Karen L., Rolette B.S., 1976, North Dakota State University


Askim, Craig A., Merce B.S., 1994, North Dakota State University

Barondeau, Dwain A., Hettinger B.S., 1969, South Dakota State University

Becker, Timothy A., Eddy B.S., 1988, North Dakota State University

Beneda, Ronald D., Cavalier B.S., 1978, North Dakota State University

Bengoechea, Wendy L., Foster M.S., 2004, North Dakota State University

Berdal, Kristi A., Nelson and Steele B.S., 1988, University of North Dakota

Bernhardt, Donna M., Grand Forks B.S., University of North Dakota

Bichler, Douglas M., Emmons B.S., 2002, North Dakota State University

Bjelland, Ellen, M., Barnes M.A., 1993, University of Missouri - Columbia

Bowman, Andrea, Bowman B.S., 2003, North Dakota State University

Brower, Lance, Stutsman M.Ed., 1996, North Dakota State University

Brown, Keith L., Divide B.S., 1982, North Dakota State University

Brummond, Bradley T., Walsh B.S., 1982, North Dakota State University

Bruns, Jodi R., Dickey B.S., 1994, North Dakota State University

Buckley, Jackie A., Morton B.S., 1979, North Dakota State University

Carpentier, Patrick E., McLean B.S., 1967, North Dakota State University

Cook, Dana R., Cass B.S., 1998, Valley City State University

Dahners, Jorey J., Grant and Sioux B.S., 2004, South Dakota State University

Dawson, Lisa, Sargent B.S., 2002, Northern State University

Dugan-Dibble, Raquel R., McHenry B.S., 1996, North Dakota State University

Efferts, Michelle, McLean M.A., 2001, University of Iowa

Elhard, Eugene, Dickey M.S., 1988, North Dakota State University

Erickson, Cheyanne M., Fort Berthold B.S., 1998, Oklahoma State University

Erickson, Carlyle, Pierce B.S., 1979, North Dakota State University

Fagerholt, Susan L., Walsh B.S., 1973, North Dakota State University

Folske, Daniel T., Burke B.S., 1980, North Dakota State University

Freden, Elizabeth, Richland B.S. 2005, North Dakota State University

Freichi, Kurt J., Stark and Billings B.S., 1983, North Dakota State University

Freichi, Mary, Williams B.S., 1976, University of Wisconsin - Stout

Freichi, Warren J., Williams B.S., 1969, North Dakota State University

Gerhardt, Sheldon, Logan B.S., 2006, North Dakota State University

Grette, Gayle L., Towner M.S., 2008, North Dakota State University

Golz, Jason, Kidder B.S., 1996, North Dakota State University

Grood, Marietta C., Bottineau and Towner B.S., 1971, North Dakota State University

Gregoire, Anne, Cass B.S., 2007, University of North Dakota

Grueneich, Randy D., Barnes B.S., 1978, North Dakota State University

Haadem, ElRoy E., Burleigh B.S., 1966, North Dakota State University
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree(s)</th>
<th>Institution</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hajicek, Katie, Barnes</td>
<td>B.S., 2000, University of North Dakota</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hall, Lane, Slope</td>
<td>B.S., 2002, Montana State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hasenbroek, Julie E., Sargent</td>
<td>B.S., 1981, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hellandsaa, Mariza L., McKenzie and Dunn</td>
<td>M.S., 1984, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henneys, James J., Mountrail</td>
<td>B.S., 1987, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hodous, Bill T., Ramsey</td>
<td>B.S., 2000, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haines, Vanessa G., Morton</td>
<td>B.S., 1984, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Huot, Wilfred, Grand Forks</td>
<td>M.S., 1976, University of Minnesota</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isbell, Susan A., Sioux</td>
<td>B.S., 1975, Montana State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jesen, Trisha R., Ward and Renville</td>
<td>B.S., 2000, Minot State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kemmet, Dena E., Mercer</td>
<td>B.S., 2000, University of Mary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketterling, Cynthia K., McIntosh</td>
<td>B.S., 1985, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kickeretz-Gerbig, Sharon, Stark and Billings</td>
<td>B.S., 1973, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klein, William L., McIntosh</td>
<td>B.S., 1979, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knoke, Scott D., Benson</td>
<td>B.S., 1986, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kraft, June M., Burleigh</td>
<td>M.S., 1991, Wootton College</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kramlich, Julie R., Adams</td>
<td>B.S., 2004, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krause, Ashley, Golden Valley</td>
<td>B.S., 2006, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kringer, John C., Cass</td>
<td>B.S., 1974, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laitre, Sara, Ramsey</td>
<td>B.S., 2004, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Langerud, Brenda K., Ramsey</td>
<td>B.S., 1974, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lee, Debra K., Ransom</td>
<td>B.S., 1978, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lien, Jeremiah, Wells</td>
<td>B.S., 2007, Dickinson State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubenow, Lesley A., Pembina</td>
<td>M.S., 2005, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lukach, Macine A., Cavalier</td>
<td>B.S., 1976, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maddock, Callie, McHenry</td>
<td>B.S., 2005, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Majidior, Ayanara, Steele</td>
<td>Ph.D., 2006, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martinson, Crystal, Towner</td>
<td>B.S., 2004, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miller, Flora, Kidder</td>
<td>B.S., 1974, Iowa State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miller, Mark D., Rollette</td>
<td>B.S., 1983, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misic, Heather, Cass</td>
<td>B.S., 2006, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monson, Karla R., Bottineau</td>
<td>B.S., 1981, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naze, Dale W., McKenzie</td>
<td>B.S., 1981, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nichols, Kendall A., Traill</td>
<td>M.S., 1993, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noland, Jean M., Grand Forks</td>
<td>B.A., 2005, Winona State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nordick, Maxine, Cass</td>
<td>B.S., 1975, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olson, Lionel, Grand Forks</td>
<td>B.S., 1994, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palczewski, Cathy S., Burleigh</td>
<td>B.S., 1984, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peterson, Nel M., Nelson</td>
<td>B.S., 1976, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rath, Wida, Carmen J., Logan</td>
<td>B.S., 1992, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rose, Michael N., Ward</td>
<td>B.S., 1970, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roth, Beth, Grant</td>
<td>B.S., 2002, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roth, Samantha, Morton</td>
<td>B.S., 2006, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runner, JoAnn, Bowman and Slope</td>
<td>B.S., 1958, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sagaser, Staven J., Grand Forks</td>
<td>B.S., 1979, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sahr, Eunice, Strutman</td>
<td>M.S., 1993, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scharmer, Lori A., Ward</td>
<td>B.S., 1976, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schaanaman, Crystal, Sheridan</td>
<td>M.S., 2004, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schlafmann, Melanie, McLean</td>
<td>B.S., 2003, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schmidt, Richard J., Oliver</td>
<td>B.S., 1993, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schumacher, Carrie, Grand Forks</td>
<td>M.S., 2008, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semler, Timothy A., Bottineau</td>
<td>B.S., 1974, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siebert, Dale L., Richland</td>
<td>M.S., 1985, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sinda, Gail M., Ward</td>
<td>B.S., 1975, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sondaland, Tara M., Wildh and Pembina</td>
<td>B.S., 2004, University of North Dakota</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Streinhauser, Jenny L., Benson</td>
<td>B.S., 2000, University of North Dakota</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strang, Michelle G., Cass</td>
<td>B.S., 1999, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Svingen, Colleen M., Pembina</td>
<td>M.S., 1999, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swenson, John D., Griggs</td>
<td>M.S., 1986, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twist, David H., Dunn</td>
<td>B.S., 1969, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ulmer, Albert L., LaMoure</td>
<td>B.S., 1981, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usatis, Rina A., Cass</td>
<td>M.S., 1992, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vander Wal, Jamie L., Burleigh and Kidder</td>
<td>B.S., 1998, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vetter, Kristen E., Emmons</td>
<td>B.S., 1995, University of Mary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voigt, LoLyne R., Renville</td>
<td>B.S., 1984, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volk-Schill, Helen M., Pembina</td>
<td>B.S., 1983, North Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weinmann, Todd, Cass</td>
<td>B.S., 2006, South Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wintness, Heather, McKenzie and Williams</td>
<td>B.S., 2003, South Dakota State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zimprich, Brian S., Ransom</td>
<td>B.S., 1997, North Dakota State University</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Laren, Donald E., Professor of Theatre Arts; Artist Director of Little Country Theatre
M.F.A., 1969, University of Iowa
Law, Bill, Assistant Director, Fine Arts; Lecturer of Music
M.A., 1994, Minnesota State University Moorhead
Lifton, Paul, Associate Professor of Theatre Arts
Ph.D., 1985, University of California, Berkeley
Lindgren, H. Elaine, Emeritus Professor of Sociology
Ph.D., 1970, University of Missouri
Littlefield, Robert S., Professor of Speech Communication
Ph.D., 1983, University of Minnesota
Lyons, Michael J., Emeritus Professor of History
Ph.D., 1969, University of Minnesota
Mack, Kyle D., Associate Professor of Music
D.A., 1992, Ball State University
Majidzadeh, Zofran, Assistant Professor of Communication
Ph.D., 2008, University of Southern California
Mara, Andrea Flood, Assistant Professor of English
Ph.D., 2003, University of New Mexico
Mara, Miriam O’Kane, Assistant Professor of English
Ph.D., 2003, University of New Mexico
Martinson, David, Lecturer of English
B.A., 1968, Moorhead State University
Mathies, Thomas F., Emeritus Professor of English
Ph.D., 1974, University of Wisconsin
Mayhew, Bruce, Professor of English
Ph.D., 1994, University of Minnesota
McDonald, Thomas D., Professor of Criminal Justice
Ph.D., 1972, Southern Illinois University
McEnery, Deona, Lecturer of English
M.A., 2001, North Dakota State University
Meister, Mark A., Associate Professor of Speech Communication
Ph.D., 1997, University of Nebraska
Miller, John, Professor of Music; Director, Division of Fine Arts
Ph.D., 1992, Northwestern University
Miller, Jo Ann, Professor of Music; Director of Choral Activities
D.M.A., 1989, Conservatory of Music, University of Cincinnati
Miller, Michael M., Assistant Professor of Library Science; Germans from Russia Bibliographer
M.Ed., 1967, University of North Dakota
M.S., 1969, University of North Dakota
Monzingo, John E., Emeritus Professor of Political Science
Ph.D., 1976, Claremont Graduate School
Morris, Bradley, Lecturer of Philosophy
M.A., 1992, University of Iowa
Nelson, Elise, Lecturer of Music
M.M., 1989, University of Wisconsin-Madison
Nelson, Paul E., Professor and Chair of Communication
Ph.D., 1992, University of Minnesota
Nichipor, Walter N., Associate Professor of Classical Languages, Cardinal Muench Seminary
Ph.D., 1975, Harvard University
Nichols, Cindy J., Senior Lecturer of English
M.F.A., 1981, University of Iowa
Noone, Katherine, Lecturer of Music
D.M.A., 2007, North Dakota State University
Norris, Jim D., Associate Professor of History
Ph.D., 1992, Tulane University
O’Connor, Amy, Assistant Professor of Communication
Ph.D., 2004, Purdue University
O’Connor, Patricia, Emeritus Professor of Library Science
M.A.L.S., 1956, College of St. Catherine
O’Connor, Robert, Professor of English
Ph.D., 1979, Bowling Green State University
Okihiro, Charles, Professor of Communication
Ph.D., 1982, Southern Illinois University
Olffert, Warren D., Associate Professor of Music; Director of Bands
Ph.D., 1992, Florida State University
Olson, Robert W., Emeritus Professor of Music
D.M.A., 1973, University of Illinois
Patnode, Matthew A., Associate Professor of Music
D.M.A., 2000, Arizona State University
Pearson, Carol, Associate Professor of Spanish
Ph.D., 1998, University of New Mexico
Pearson, Judy C., Professor of Communication; Associate Dean of Arts, Humanities, and Social Sciences
Ph.D., 1975, Indiana University
Peet, Howard D., Emeritus Professor of English
M.S., 1965, Moorhead State University
Peterson, Larry R., Professor of History
Ph.D., 1978, University of Minnesota
Platt, Carrie Anne, Assistant Professor of Communication
Ph.D., 2008, University of Southern California
Pull, Mary E., Senior Lecturer of English; Director of Center for Writers
M.A., 2003, North Dakota State University
Query, Jay M., Emeritus Professor of Sociology and Psychology
Ph.D., 1960, University of Kentucky
Raile, Amber N.W., Assistant Professor of Communication
Ph.D., 2008, Michigan State University
Raile, Eric, Assistant Professor of Political Science
Ph.D., 2005, Michigan State University
Rathge, Richard W., Professor of Sociology and Agribusiness and Applied Economics; Director of State Data Center
Ph.D., 1981, Michigan State University
Richardson, Bernard L., Emeritus Professor of Communication
M.S., 1966, North Dakota State University
Richardson, Gerald A., Emeritus Professor of Communication
M.A., 1967, University of Washington
Riley, Thomas J., Professor of Anthropology; Dean, College of Arts, Humanities and Social Sciences; Director, Institute for Regional Studies
Ph.D., 1975, University of Hawaii
Saat, Cynthia L., Lecturer of French
M.A., 1980, Middlebury College
Sandland, Julie A., Lecturer of English
M.A., 1990, North Dakota State University
Sassi, Enrico, Senior Lecturer in English
M.F.A., 1997, University of Alaska, Fairbanks
Sassi, Kelly, Assistant Professor of English
Ph.D., 2008, University of Michigan
Sather-Wagstaff, Joy, Assistant Professor of Anthropology
Ph.D., 2007, University of Illinois Urbana-Champaign
Scott, Maureen T., Lecturer of English
M.A., 1989, University of North Dakota
Shaw, Richard M., Emeritus Professor of English
Ph.D., 1985, Ball State University
Sherman, William C., Emeritus Professor of Sociology
M.A., 1965, University of North Dakota
Silkenat, David, Assistant Professor of History
Ph.D., 2007, University of North Carolina – Chapel Hill
Slobin, Kathleen, Emeritus Professor of Sociology
Ph.D., 1991, University of California, San Francisco
Soria-Dufner, Carmen, Lecturer of Spanish
M.A., 1980, University of Northern Iowa
Stichman, Amy J., Assistant Professor of Criminal Justice
Ph.D., 2003, University of Cincinnati
Stickney, Gwyn, Assistant Professor of Spanish
Ph.D., 2004, Indiana University, Bloomington
Strandness, Jean, Emeritus Professor of English
Ph.D., 1974, Michigan State University
Sublett, Virginia, Associate Professor of Music
D.M.A., 1997, University of California, San Diego
Sullivan, Dale L., Professor of English; Head, Department of English
Ph.D., 1988, Benalmadena Polytechnic Institute
Sung, Benjamin, Lecturer of Music
D.M., 2006, Indiana University
Swenson, David G., Associate Professor of Visual Arts
M.F.A., 1992, University of Minnesota
Targott, Amy Rupiper, Associate Professor of English
Ph.D., 2002, Texas Christian University
Temanson, Kaye, Lecturer of English
M.A., 2001, North Dakota State University
Theile, Verena, Assistant Professor of English
Ph.D., 2006, Washington State University
Thomas, Kathryn A., Instructor of Library Science; Reference and Documents Librarian
M.A., 1974, University of Denver
Thompson, Kevin M., Professor of Criminal Justice; Head of Department of Criminal Justice and Political Science
Ph.D., 1986, University of Arizona
Thrasher, Michael, Associate Professor of Music
D.M.A., 1997, University of North Texas
Tollefson, Wayne E., Emeritus Professor of Art
M.A., 1962, Michigan State University
Totten, Gary, Associate Professor of English
Ph.D., 1998, Ball State University
Trautwein, Charlotte G., Emeritus Professor of Music
M.S., 1968, University of Illinois
Trautwein, John W., Emeritus Professor of Music
M.M.Ed, 1961, American Conservatory of Music
Advanced Certificate in Music Education, 1965, University of Illinois
Trump, Andrew B., Lecturer of English
M.A., 1984, South Dakota State University
Tunstall, William, Lecturer of English
M.A., 2001, North Dakota State University
Ubedolah, E. James, Emeritus Professor of Speech Communication
M.A., 1961, New York University
Varland, Roohan, Associate Professor of Theatre Arts
M.F.A., 1989, Northern State University
Waid, Courtney A., Assistant Professor of Criminal Justice
Ph.D., 2006, Florida State University
Ward, Steve A., Emeritus Professor of English
M.A., 1964, North Dakota State University
Wargo, Vincent, Assistant Professor of Philosophy, Cardinal Muench Seminary
Ph.D., 2005, University of Leuven, Belgium
Weber, Christina, Assistant Professor of Sociology
Ph.D., 2005, State University of New York - Buffalo
Weber, Michael J., Associate Professor of Music
A.Mus.D., 1991, University of Wisconsin
Wood, Robert A., Associate Professor of Political Science
Ph.D., 1983, University of Missouri - Columbia
Yoon, Dong Koon, Assistant Professor of Emergency Management
Ph.D., 2007, Cornell University
Youngs, George A., Professor of Sociology; Director of Social Science Research Center
Ph.D., 1981, University of Iowa
Yun, TaeWoong, Assistant Professor of Communication
Ph.D., 2007, University of Texas at Austin

**College of Business**

Altenburg, Karl, Assistant Professor of Management Information Systems
Ph.D., 1999, North Dakota State University
Anderson, Margaret, Associate Professor of Accounting
Ph.D., 1989, Indiana University
Bahrami, Bahman, Professor of Economics
Ph.D., 1983, University of Nebraska, Lincoln
Birzan, John, Assistant Professor of Management
Ph.D., 1997, University of Wisconsin - Milwaukee
Brown, Paul R., C.P.A., Senior Lecturer of Business Administration; MBA Director
M.B.A., 1989, North Dakota State University
Bowlin, William, Professor of Accounting; Department Head
Ph.D., 1984, University of Texas at Austin
Clifton, James W., C.P.A., Assistant Professor of Accounting Practice,
M.Acc., 1988, University of North Dakota
Dier, Donna K., Assistant Professor of Accounting
Ph.D., 1989, University of North Dakota
Dowdell, Thomas, Assistant Professor of Accounting
Ph.D., 2004, Temple University
Eise, C. Frederick, Emeritus Professor of Business Administration
Ph.D., 1971, University of Iowa
Elder, John, Professor of Finance
Ph.D., 1995, University of Virginia
Fredlich, Karen A., Associate Professor of Management
Ph.D., 1994, University of Minnesota
Glatt, Janice O., C.P.A., Eisele Teaching Fellow
M.B.A., 1985, North Dakota State University
Jacobson, Sarah W., Emeritus Professor of Business Administration
Ph.D., 1991, University of Massachusetts, Amherst
Johnson, Ronald D., Professor; Dean of College of Business
D.B.A., 1970, Indiana University
Jones, Joseph M., Associate Professor of Marketing
Ph.D., 1994, University of Missouri - Columbia
Jorgenson, Maggie, C.P.A., C.M.A., Lecturer of Accounting
M.Acc., 1990, University of North Dakota
Klam, Bonnie K., Associate Professor of Accounting
Ph.D., 1999, Virginia Commonwealth University
Knoopf, Terry W., Associate Professor of Business Law
J.D., 1981, University of North Dakota
Krinakumar, Sukumar, Assistant Professor of Management
Ph.D., 2008, Virginia Polytechnic Institute and State University
Lattner, Joseph, Instructor of Management Information Systems
M.B.A., 1988, California Polytechnic State University
Li, Jia, Assistant Professor of Marketing
Ph.D., 2007, University of Alberta
Lian, Qin, Assistant Professor of Finance
Ph.D., 2007, University of Alabama
Macintosh, Gerrard, Professor of Marketing; Department Chair
Ph.D., 1992, University of Nebraska - Lincoln
Olsen, Lori, C.P.A., Assistant Professor of Accounting
Ph.D., 2001, University of Oklahoma
Petersen, Tim, Professor of Management; Associate Dean
Ph.D., 1988, Texas A&M University
Pillai, Rajani Ganesh, Assistant Professor of Marketing
Ph.D., 2008, University of Central Florida
Rymph, R. Douglas, Assistant Professor of Management
Ph.D., 1999, University of South Carolina
Schiabulli, John H., Emeritus Professor of Business Administration
Ph.D., 1970, University of Oregon
Snyder, Herbert, Associate Professor of Accounting
Ph.D., 1994, Syracuse University
Stevens, Charles D., Associate Professor of Management
Ph.D., 1998, University of Kansas
Stockman, H. Donald, C.P.A., Emeritus Professor of Business Administration
M.S.B.A., 1965, University of North Dakota
Symerekovsky, Joseph, Assistant Professor of Management
Ph.D., 2003, Case Western Reserve University
Tangpong, Charnchai, Assistant Professor of Management
Ph.D., 2002, Southern Illinois University Carbondale
Tian, Ruilin, Assistant Professor of Finance
Ph.D., 2008, Georgia State University
Troh, Rodney D., Associate Professor of Management
Ph.D., 1994, Purdue University
Zhang, Limin, Assistant Professor of Management Information Systems
Ph.D., 2005, University of Arizona

**College of Engineering and Architecture**

Ababei, Cristinel, Assistant Professor of Electrical and Computer Engineering
Ph.D., 2004, University of Minnesota
Abdelrahman, Magdy, Assistant Professor of Civil Engineering
Ph.D., 1996, University of Illinois - Urbana
Akhanov, Iskander, Professor of Mechanical Engineering
Ph.D., 1983, Lomonosov University of Moscow
Aly Ahmed, Bakr, Assistant Professor of Architecture and Landscape Architecture
M.Arch., 1999, Minia University, Egypt
Ph.D., 2002, Virginia Tech
Anderson, Donald A., Associate Professor of Civil Engineering; Director, Transportation Technology Transfer Center
Ph.D., 1982, Texas A&M University
Anderson, Edwin M., Emeritus Professor of Electrical Engineering
M.S., 1949, University of Denver
M.S., 1972, North Dakota State University
Asa, Eric, Assistant Professor of Construction Management and Engineering
Ph.D., 2002, University of Alberta
Azarim, Fardad, Assistant Professor of Mechanical Engineering
Ph.D., 2007, University of Toronto
Baker, Leslie F., Associate Professor of Agricultural and Biosystems Engineering; Department Chair
M.S., 1972, North Dakota State University
Bakken, Stewart E., Emeritus Professor of Mechanical Engineering
M.S., 1961, North Dakota State University
Bates, William A., Emeritus Professor of Electrical Engineering
Ph.D., 1968, University of Wyoming
Barnhouse, Mark, Assistant Professor of Architecture and Landscape Architecture
M.Arch., 1988, Pratt Institute
Bczarba, Achintya, Assistant Professor of Civil Engineering
Ph.D., 2002, University of Nebraska - Lincoln
Bilen-Green, Canan, Associate Professor of Industrial and Manufacturing Engineering
Ph.D., 1998, University of Wyoming
Bon, Thomas A., Senior Lecturer of Agricultural and Biosystems Engineering
Ph.D., 2003, North Dakota State University
Boeker, Darrell, Associate Professor of Architecture and Landscape Architecture
M.Arch., 1979, University of Colorado
Bora, Ganesh, Assistant Professor of Agricultural and Biosystems Engineering
Ph.D., 2005, Kansas State University
Christianson, Mike, Assistant Professor of Architecture and Landscape Architecture
M.Arch., 1997, University of Minnesota
Chu, Xuefeng, Assistant Professor of Civil Engineering
Ph.D., 2002, University of California – Davis
Cook, John R., Associate Professor of Industrial and Manufacturing Engineering
Ph.D., 1991, Purdue University
Crutchfield, David, Assistant Professor of Architecture and Landscape Architecture
M.Arch., 2004, University of Texas
DeSaram, Darshi, Assistant Professor of Construction Management and Engineering
Ph.D., 2002, Hong Kong Polytechnic University
Evans, Robert, Adjunct Professor of Agricultural and Biosystems Engineering
Ph.D., 1981, Colorado State University
Ewert, Daniel L., Professor of Electrical and Computer Engineering; Department Chair
Ph.D., 1989, University of North Dakota
Famulari, Steve, Assistant Professor of Architecture and Landscape Architecture
M.A.L., 2000, State University of New York
Fan, Lingling, Assistant Professor of Electrical and Computer Engineering
Ph.D., 2001, West Virginia University
Furumark, Kambiz, Professor of Industrial and Manufacturing Engineering; Department Chair
Ph.D., 1992, University of Texas - Arlington
Farden, David C., Professor of Electrical and Computer Engineering
Ph.D., 2006, University of California, Davis
Gaj, Srivapan, Assistant Professor of Civil Engineering
Ph.D., 2006, University of California, Davis
Gao, Zhihui, Associate Professor of Construction Management and Engineering
Ph.D., 2004, Iowa State University
Ge, Zhi, Assistant Professor of Construction Management and Engineering
Ph.D., 2005, Iowa State University
Gleye, Paul, Professor of Architecture and Landscape Architecture; Department Chair
Ph.D., 1983, University of California - Los Angeles
Glower, Jacob, Associate Professor of Electrical and Computer Engineering
Ph.D., 1988, Ohio State University
Gopen, Sherman P., Associate Professor of Mechanical Engineering
Ph.D., 1977, Texas A&M University
Green, Roger, Associate Professor of Electrical and Computer Engineering
Ph.D., 1998, University of Wyoming
Han, Chung-Souk, Assistant Professor of Civil Engineering
Ph.D., 1999, University of Hannover, Germany
Hellervang, Kenneth J., Professor of Agricultural and Biosystems Engineering
Ph.D., 1989, North Dakota State University
Henderson, Allen J., Emeritus Professor of Industrial and Manufacturing Engineering
Ph.D., 1968, Iowa State University
Isgiri, Elvin, Emeritus Professor of Industrial and Manufacturing Engineering
M.S., 1983, North Dakota State University
Jenkinson, Harold L., Emeritus Professor of Architecture
M.Arch., 1972, University of Illinois
Jia, Xinhua, Assistant Professor of Agricultural and Biosystems Engineering
Ph.D., 2004, University of Arizona
Kallmeyer, Alan R., Professor of Mechanical Engineering; Department Chair
Ph.D., 1995, University of Iowa
Karami, Ghodratollah, Professor of Mechanical Engineering
Ph.D., 1984, Imperial College of Science and Technology, University of London
Katti, Dino B., Professor of Civil Engineering; Department Chair
Ph.D., 1991, University of Arizona
Katti, Kalpana, Professor of Civil Engineering
Ph.D., 1996, University of Washington
Katti, Rajendra, Professor of Electrical and Computer Engineering
Ph.D., 1991, Washington State University
Kavaseri, Rajesh, Assistant Professor of Electrical and Computer Engineering
Ph.D., 2002, Washington State University
Khan, Eakalak, Associate Professor of Civil Engineering
Ph.D., 1997, University of California, Los Angeles
Khan, Samee, Assistant Professor of Electrical and Computer Engineering
Ph.D., 2007, University of Texas – Arlington
Kim, Yul (Jimmy), Assistant Professor of Civil Engineering
Ph.D., 2006, Queen’s University
Kirschmer, Merlin D., Emeritus Associate Professor of Construction Management and Engineering
M.S., 1976, University of California - Berkeley
Krause, Daniel J., Emeritus Professor of Electrical and Computer Engineering
Ph.D., 1972, Colorado State University
Kucera, Henry L., Emeritus Professor of Agricultural and Biosystems Engineering
Ph.D., 1959, North Dakota State University
La Palm, George L., Emeritus Professor of Civil Engineering
Ph.D., 1948, Purdue University
Li, Hongxiang, Assistant Professor of Electrical and Computer Engineering
Ph.D., 2008, University of Washington
Li, Kam, Emeritus Professor of Mechanical Engineering
Ph.D., 1965, Oklahoma State University
Lim, Ivan, Assistant Professor of Electrical and Computer Engineering
Ph.D., 2005, University of Maryland
Lin, Wei, Associate Professor of Civil Engineering
Ph.D., 1992, New York State University, Buffalo
Lindquist, Mark, Assistant Professor of Architecture and Landscape Architecture
M.L.A., 2002, University of Toronto
Longheny, Robert R., Emeritus Professor of Electrical Engineering
M.S., 1963, University of Minnesota
Mahalingam, Ganapathy, Associate Professor of Architecture and Landscape Architecture
M.Arch., 1995, University of Florida
Makhro, Reba, Assistant Professor of Industrial and Manufacturing Engineering
Ph.D., 1989, North Dakota State University
Martino, Valery, Associate Professor of Industrial and Manufacturing Engineering
Ph.D., 1992, Technical University of Sofia, Bulgaria
Martsens, Steve C., Associate Professor of Architecture and Landscape Architecture
M.Arch., 1988, University of Minnesota
Maurer, Karl G., Emeritus Professor of Mechanical Engineering
Ph.D., 1966, University of Kansas
Mazaheri, Mort L., Emeritus Professor of Community and Regional Planning
M.S., 1963, University of Wisconsin
McIntyre, Charles, Associate Professor of Construction Management and Engineering
Ph.D., 1996, Pennsylvania State University
Mehta, Sudhir I., Professor of Mechanical Engineering
Ph.D., 1982, Indian Institute of Technology, Bombay, India
Moilanen, Charles W., Emeritus Professor of Agricultural and Biosystems Engineering
M.S., 1963, North Dakota State University
Nazar, G. H., Lecturer of Mechanical Engineering
Ph.D., 1977, Texas A&M University
Oberlander, LTC David M., Professor of Military Science; Department Chair
M.S., 1998, Northwestern University
Padmanabhan, G., Professor of Civil Engineering
Ph.D., 1980, Purdue University
Panigrahi, Suranjan, Professor of Agricultural and Biosystems Engineering
Ph.D., 1992, Iowa State University
Pepple, Kathleen, Assistant Professor of Architecture and Landscape Architecture
M.C.R.P., 1991, North Dakota State University
Pestes, Michael N., Emeritus Professor of Mechanical Engineering
M.S., 1959, North Dakota State University
Peterson, Donald E., Emeritus Associate Professor of Electrical Engineering
M.S., 1958, North Dakota State University
Pfister, Philip C., Emeritus Professor of Mechanical Engineering
Ph.D., 1962, Illinois Institute of Technology
Piegazz Linquist, Kaarin, Assistant Professor of Architecture and Landscape Architecture
M.Arch., 2002, University of Toronto
Pieri, Robert V., Professor of Mechanical Engineering
Ph.D., 1987, Carnegie - Mellon University
Pratt, George L., Emeritus Professor of Agricultural and Biosystems Engineering
Ph.D., 1967, Oklahoma State University
Price, Edward W., Emeritus Professor of Mechanical Engineering
M.S., 1958, North Dakota State University
Pryor, Scott W., Assistant Professor of Agricultural and Biosystems Engineering
Ph.D., 2005, Cornell University
Rahman, Shahidur, Assistant Professor of Agricultural and Biosystems Engineering
Ph.D., 2004, University of Manitoba
Ramsay, Ronald L.M., Associate Professor of Architecture and Landscape Architecture
M.Arch., 1992, University of Texas, Austin
Rao, Bapuwarra V.V., Professor of Electrical and Computer Engineering
Ph.D., 1970, Indian Institute of Technology, Madras, India
Rieder, William G., Emeritus Professor of Mechanical Engineering
Ph.D., 1971, University of Nebraska - Lincoln
Rogers, David A., Professor of Electrical and Computer Engineering
Ph.D., 1971, University of Washington
Saafi, Mohamed, Associate Professor of Construction Management and Engineering
Ph.D., 2001, University of Alabama – Huntsville
Schere, Thomas F., Associate Professor of Agricultural and Biosystems Engineering
Ph.D., 1986, University of Minnesota
Schroeder, Mark, Assistant Professor of Electrical and Computer Engineering
Ph.D., 1999, University of Texas, Austin
Schwaen, Regan, Associate Professor of Architecture and Landscape Architecture
M.Arch., 1992, Aarhuskolen i Aarhus, Denmark
Selekwa, Majura, Assistant Professor of Mechanical Engineering
Ph.D., 2001, Texas A&M University
Shi, Jing, Assistant Professor of Industrial and Manufacturing Engineering
Ph.D., 2004, Purdue University
Smith, Donald A., Emeritus Professor of Electrical and Computer Engineering
Ph.D., 1968, University of Minnesota
Smith, Gary R., Professor, Dean, College of Engineering and Architecture
Ph.D., 1986, Purdue University
Solseng, Elton G., Instructor of Agricultural and Biosystems Engineering
M.S., 1980, North Dakota State University
Song, Jongchul, Assistant Professor of Construction Management and Engineering
Ph.D., 2005, University of Texas
Srinivasan, Sadasivan, Assistant Professor of Electrical and Computer Engineering
Ph.D., 2007, Georgia Institute of Technology
Steele, Dean D., Associate Professor of Agricultural and Biosystems Engineering
Ph.D., 1991, University of Minnesota
Steigman, Carl E., Emeritus Professor of Agricultural and Biosystems Engineering
Ph.D., 1966, Michigan State University
Stewart, Earl E., Emeritus Professor of Community and Regional Planning
M.S., 1953, Massachusetts Institute of Technology
Stewart, Michael, Lecturer of Mechanical Engineering
Ph.D., 1979, University of Illinois - Urbana
Stuch, Donald L., Emeritus Professor of Electrical and Computer Engineering
Ph.D., 1972, Colorado State University
Sumathy, Krishnan, Associate Professor of Mechanical Engineering
Ph.D., 1995, Indian Institute of Technology – Madras, India
College of Human Development and Education

Aakre, Dean E., Extension Specialist
M.Ed., 1998, North Dakota State University

Albrecht, Jay M., Instructor of Health, Nutrition and Exercise Sciences
M.S., 2002, North Dakota State University

Anderson, Earl A., Emeritus Professor of Education
Ed.D., 1962, Washington State University

Anderson, Sharon D., Emeritus Professor of Human Development and Education
Ph.D., 1994, University of North Dakota

Arg, Judith M., Senior Lecturer of Health, Nutrition and Exercise Sciences/School of Education
M.H.E., 1989, Idaho State University

Bach, Annette S., Emeritus Professor of Extension
M.S., 1972, University of Southern California

Barnhart, Thomas C., Professor of Health, Nutrition and Exercise Sciences
Ph.D., 1978, University of New Mexico

Baxow-Shoop, Holly E., Professor of Apparel, Design, and Hospitality Management; Department Head
Ph.D., 1981, Oklahoma State University

Beck, Patricia L., Emeritus Professor of Extension
M.S., 1965, Colorado State University

Berglund, Patricia, Emeritus Professor of Health, Nutrition and Exercise Sciences
Ph.D., 1988, North Dakota State University

Biewer, Adrian, Extension Specialist
M.S., 1981, North Dakota State University

Bjelde, Kristine, Assistant Professor of Child Development and Family Science
Ph.D., 2007, North Dakota State University

Blodgett Salasa, Elizabeth, Assistant Professor of Child Development and Family Science
Ph.D., 2008, University of Notre Dame

Borgen, Vernon A., Adjunct Professor of Health, Nutrition and Exercise Sciences
B.S., 1979, North Dakota State University

Borr, Mari, Assistant Professor, School of Education
Ph.D., 2005, University of North Dakota

Braaten, Ann W., Assistant Professor of Apparel, Design, and Hospitality Management
Ph.D., 2005, University of Minnesota

Brattel, Marly J., Assistant Professor of Child Development and Family Science
Ph.D., 2002, University of North Dakota

Brotheron, Sean, Extension Specialist and Associate Professor of Child Development and Family Science
Ph.D., 1999, Oregon State University

Brunt, Ardith R., Associate Professor of Health, Nutrition and Exercise Sciences
Ph.D., 1999, Iowa State University

Busholz, Carol, Assistant Professor, School of Education
Ph.D., 2005, Kansas State University

Busholz, Roman J., Emeritus Professor of Health, Nutrition and Exercise Sciences
Ed.D., 1991, University of North Dakota

Burkholder, Vel Rae, Emeritus Professor of Health, Nutrition and Exercise Sciences
M.S., 1968, North Dakota State University

Carlson, Thomas Stone, Associate Professor of Child Development and Family Science
Ph.D., 2000, Iowa State University

Christensen, Bryan K., Associate Professor of Health, Nutrition and Exercise Sciences
Ph.D., 2000, University of Kansas

Clapper, Amy Ann, Professor of Practice of Education
Ed.D., 1996, Drake University

Daniels, Lisa M., Adjunct Associate Professor, School of Education
Ed.D., 2002, Texas A&M University

Deal, James, Professor of Child Development and Family Science; Department Head
Ph.D., 1987, University of Georgia

Deutsch, Michael Joseph, Jr., Assistant Professor of Health, Nutrition and Exercise Sciences
Ph.D., 2007, North Dakota State University

Dittman, Jennette K., Emeritus Professor of Education
Ph.D., 1984, Pennsylvania State University

Dobry, Albert M., Emeritus Professor of Education
Ph.D., 1973, Michigan State University

Duffield, Stacy K., Assistant Professor, School of Education
Ph.D., 2003, University of North Dakota

Duggan, Mary, Head Teacher, Center for Child Development B.S., 1988, North Dakota State University

Edemeev, M. M., Emeritus Professor of Music
M.M., 1980, Vender Cook College of Music

Eighmy, Myron, Associate Professor, School of Education
Ed.D., 1995, University of Minnesota

Erhardt, Marvin J., Adjunct, Assistant Professor of Education
Ed.D., 1994, University of Wyoming

Evans, Nicole, Lecturer of Health, Nutrition and Exercise Science
M.S., 2004, North Dakota State University

Fitzgerald, Margaret A., Associate Professor of Child Development and Family Science
Ph.D., 1997, Iowa State University

Fragodt, Alvin L., Emeritus Professor of Extension
M.S., 1974, North Dakota State University

Gange, Kara, Instructor of Health, Nutrition and Exercise Sciences
M.A., 1998, University of Nebraska at Kearney/Garden

Gardin, Robert A., Emeritus Professor of Health, Nutrition and Exercise Sciences
Ph.D., 1964, University of North Dakota

Gebeke, Debra, Director, Family and Consumer Sciences Extension
Ph.D., 1996, University of North Dakota

Gold, Alldy, Assistant Professor/Extension Specialist of Health, Nutrition and Exercise Sciences
Ph.D., 2007, North Dakota State University

Gregoire, Beulah F., Emeritus Professor of Health, Nutrition and Exercise Sciences
M.Ed., 1953, University of Minnesota

Gress, Nancy M., Director, Student Services and Advancement
M.S., 1976, North Dakota State University

Guilbrandson, Ruth, Emeritus Professor of Extension
M.S., 1973, North Dakota State University

Habedank, Debra A., Director, Center for Child Development
M.S., 1985, North Dakota State University

Hall, Thomas, Assistant Professor, School of Education
Ed.D., 2005, University of South Dakota

Hannon, J. Wade, Associate Professor, School of Education
Ed.D., 1983, University of Arkansas

Hansen, Pamela J., Associate Professor of Health, Nutrition and Exercise Sciences
Ph.D., 2000, University of South Dakota

Hanson, Alan, Lecturer, School of Education
M.S., 1984, St. Cloud State University

Hauga, Linda, Extension Specialist
M.E., 2004, Leslie University

Hauser, Frederic J., Emeritus Professor of Extension
M.S., 1967, North Dakota State University

Heckner, Joel, Associate Professor of Child Development and Family Sciences
Ph.D., 1996, University of Chicago

Hirani, Aditi K., Assistant Professor of Apparel, Design, and Hospitality Management
M.S., 2003, University of North Carolina - Greensboro

Holtbrook, Sandra, Adjunct Professor of Education
Ph.D., 1984, University of Minnesota

Holes-Dickson, Barbara A., Family Nutrition Program Specialist
B.S., 1990, University of Mary

Holm, Edna T., Emeritus Professor of Health, Nutrition and Exercise Sciences
Ph.D., 1987, University of Minnesota

Horejoi, Romain J., Emeritus Professor of Health, Nutrition and Exercise Sciences
Ed.D., 1991, University of North Dakota

Isrow, Denis F., Emeritus Professor of Health, Nutrition and Exercise Sciences
Ed.D., 1975, University of Utah

Jha, Dipa, Senior Lecturer of Apparel, Design, and Hospitality Management
M.S., 2004, University of Wisconsin-Stout

Johnson, Virginia Clark, Professor of Child Development and Family Science; Dean, College of Human Development and Education
Ph.D., 1984, Pennsylvania State University

Kaler, Nancy J., Senior Lecturer of Child Development and Family Science
M.S., 1981, University of North Dakota

Kers, Roger D., Emeritus Professor of Health, Nutrition and Exercise Sciences
Ed.D., 1970, University of South Dakota

Ketterling, Gary, Assistant Professor, School of Education
Ph.D., 1992, University of Iowa, Iowa City
Ph.D., 2006, University of North Dakota
Lee, Jieha, Assistant Professor of Apparel, Design and Hospitality Management
Ph.D., 2008, University of Minnesota
Light, Harriet E., Emeritus Professor of Child Development and Family Science
Ph.D., 1976, Michigan State University
Liguori, Gary, Assistant Professor of Health, Nutrition and Exercise Sciences
Ph.D., 2005, North Dakota State University
Manikowske, Linda J., Associate Professor of Apparel, Design, and Hospitality Management
Ph.D., 1993, Iowa State University
Marin, William O., Professor of Education and Mathematics; Department Head
Ph.D., 1993, University of Wisconsin - Madison
Martindale, Thomas, Emeritus Professor of Extension
M.S., 1967, University of North Dakota
Maughan, Arthur W., Associate Professor of Health, Nutrition and Exercise Sciences
M.S., 1966, North Dakota State University
McAllister, Shirley E. Friend, Emeritus Professor of Apparel, Design, and Hospitality Management
Ed.D., 1960, University of Arkansas
McGeorge, Christine R., Assistant Professor of Child Development and Family Science
Ph.D., 2005, University of Minnesota
Montplaisir, Lisa, Assistant Professor of Biological Sciences and School of Education
Ph.D., 2003, University of Arizona
Murphy, Patricia D., Emeritus Professor of Education
Ph.D., 1969, University of Minnesota
Narum, Gary A., Emeritus Associate Professor of Education
Ed.D., 1969, University of Wyoming
Nass, Marlliny, Emeritus Professor of Health, Nutrition and Exercise Sciences
M.S., 1955, Pennsylvania State University
Nelson, Jill, Assistant Professor, School of Education
Ph.D., 2005, Kent State University
Nielsen, Robert C., Professor, School of Education
Ed.D., 1973, University of Northern Colorado
North, Barbara B., Emeritus Professor of Health, Nutrition and Exercise Sciences
M.S., 1959, University of Minnesota
Overton, Kimberly A., Lecturer, School of Education
M.Ed., 2000, North Dakota State University
Pankow, Debra L., Assistant Professor and Extension Specialist
Ph.D., 2002, South Dakota State University
Pavek, F. Leslie, Emeritus Professor of Education
Ed.D., 1968, University of North Dakota
Perkins, Ann, Adjunct Assistant Professor, Child Development and Family Science
Ph.D., 2003, Iowa State University
Phillips, Woomi, Assistant Professor of Apparel, Design and Hospitality Management
Ph.D., 2008, Kansas State University
Priebe, Donald W., Emeritus Professor of Education
Ph.D., 1968, University of Minnesota
Querry, Sharon, Extension Specialist
Ph.D., 1997, Iowa State University
Ragan, Ann, Lecturer, Apparel, Design, and Hospitality Management
B.S., 2000, North Dakota State University
Randall, Brandy A., Associate Professor of Child Development and Family Science
Ph.D., 2002, University of Nebraska - Lincoln
Ray-Degges, Susan, Associate Professor of Apparel, Design, and Hospitality Management
Ph.D., 1995, University of Missouri - Columbia
Rhee, Yeong S., Associate Professor of Health, Nutrition and Exercise Sciences
Ph.D., 1999, Oklahoma State University
Richardson, Kellie, Lecturer of Apparel, Design and Hospitality Management
B.S., 2001, North Dakota State University
Sanders, Gregory F., Professor of Child Development and Family Science; Associate Dean, College of Human Development and Education
Ph.D., 1983, University of Georgia
Schmidt, Mark, Assistant Professor, School of Education
Ed.S., 1998, North Dakota State University
Sceby, Donald R., Emeritus Professor of Botany/Biology and Education
Ph.D., 1968, North Dakota State University
Silkenat, David, Assistant Professor of Education
Ph.D., 2007, University of North Carolina – Chapel Hill
Stamen, Ronald M., Professor, School of Education
Ph.D., 1990, Ohio State University
Stastny, Sherri N., Assistant Professor, Health, Nutrition and Exercise Sciences
Ph.D., 2007, North Dakota State University
Strand, Bradford N., Professor of Health, Nutrition and Exercise Sciences
Ph.D., 1948, University of New Mexico
Sunderlin, Sara, Senior Lecturer, Apparel, Design, and Hospitality Management
M.S., 2001, North Dakota State University
Teigland, John W., Emeritus Professor of Education
Ph.D., 1964, University of North Dakota
Terbizan, Donna J., Professor of Health, Nutrition and Exercise Sciences
Ph.D., 1982, Ohio State University
Torges, Cynthia, Assistant Professor of Child Development and Family Science
Ph.D., 2006, University of Michigan, Ann Arbor
Tourwein, Charlotte G., Emeritus Professor of Music and Child Development and Family Science and Education
M.S., 1965, University of Illinois
Tourwein, John W., Emeritus Professor of Music and Education
M.M.Ed., 1961, American Conservatory of Music
Advanced Certificate in Music Education, 1965, University of Illinois
Vettern, Rachelle E., Assistant Professor of Education; Extension Specialist
Ph.D., 2008, North Dakota State University
Wageman, Justin, Associate Professor, School of Education
Ph.D., 1999, University of North Dakota
Wallman, George H., Emeritus Professor of Education
Ph.D., 1980, Michigan State University
Welch, Anita, Assistant Professor of Education
Ph.D., 2007, University of Kansas
Weitinger, Ann, Lecturer of Child Development and Family Sciences
M.S., 2005, North Dakota State University
Wigilt, James V., Emeritus Professor of Education
Ed.D., 1966, Indiana University
Wilson, Heidi, Adjunct Professor of Apparel, Design, and Hospitality Management
MFA, 2002, University of Mary Winters, Lynette, Senior Lecturer of Health, Nutrition and Exercise Sciences
M.S., 1987, South Dakota State University
Wolf, Kara L., Associate Professor, Apparel, Design, and Hospitality Management
Ph.D., 2002, Kansas State University
Wood, Nathan, Assistant Professor of Education
Ph.D., 2006, University of Minnesota
Woods, Rebecca, Assistant Professor of Child Development and Family Science
Ph.D., 2006, Texas A & M University
Woods, William E., Emeritus Professor of Education
Ed.D., 1969, Washington State University
Young, R. Brent, Assistant Professor, School of Education
Ph.D., 2006, Oklahoma State University, Stillwater

Faculty

College of Pharmacy, Nursing, and Allied Sciences

Albano, Christian, Assistant Professor of Pharmacy Practice
Ph.D., 2005, North Dakota State University
Alberty, Sandra, Assistant Professor of Nursing
M.S.N., 2001, University of Mary
Balaz, Stefan, Professor of Pharmaceutical Sciences
Ph.D., 1985, Comenius University in Bratislava, Slovakia
Bergman, Mary Jo, Adjunct Professor of Allied Sciences
M.Ed., 1994, University of Mary
Biberdorf, Robert, Assistant Professor of Pharmacy Practice
M.S., 1978, North Dakota State University
Brise, Pamela G., Adjunct Professor of Allied Sciences
M.S., 1996, University of South Dakota
Brown, Wendy, Assistant Professor of Pharmacy Practice
Pharm.D., 2001, North Dakota State University
Brunelle, Patrick, Adjunct Clinical Instructor of Pharmacy Practice
B.S., 1992, North Dakota State University
Carlson, James D., Adjunct Professor of College of Pharmacy, Nursing, and Allied Sciences
Pharm.D., 1976, University of Michigan
Cashmore, Robert W., Adjunct Professor of Allied Sciences
M.D., 1965, University of Minnesota
Chatterjee, Satadal, Associate Professor of Pharmaceutical Sciences
Ph.D., 1986, University of Calcutta, India
Christensen, Thomas P., Adjunct Professor of Pharmacy Practice
Ph.D., 1995, University of Michigan
Clarens, Richard D., Lecturer of Pharmacy Practice
Pharm.D., 1979, University of Minnesota
Danielson, Byron, Adjunct Professor of Pharmacy
M.D., 1966, University of Minnesota
DeBult, David A., Adjunct Clinical Instructor of Pharmacy Practice
B.S., 1987, North Dakota State University
Deibler, Kyla, Adjunct Professor of Allied Sciences
M.S., 2005, Drake University
Dewey, Mark, Assistant Professor of Pharmacy Practice
Pharm.D., 1999, North Dakota State University
Dexter, R. David, Adjunct Professor of Allied Sciences
M.D., 1985, University of Minnesota
Dhanwada, Vijaya, Adjunct Professor of Allied Sciences
M.D., 1969, Gunter Medical College, India
Doherty-Johnson, Shelley, Adjunct Clinical Instructor of Pharmacy Practice
B.S., 1980, North Dakota State University
Dohman, Tammie K., Adjunct Clinical Instructor of Pharmacy Practice
B.S., 1982, North Dakota State University
Drummond, Amy, Assistant Professor of Pharmacy Practice
Pharm.D., 1996, North Dakota State University
Finken, Gerald E., Lecturer of Pharmacy Practice
M.S., 1996, Kean College of New Jersey
Fishier, Amy, Assistant Professor of Nursing
M.A., 1992, College of St. Catherine
Fitz, Alicia, Assistant Professor of Pharmacy Practice
Pharm.D., 1996, Creighton University
Focken, Rebecca, Assistant Professor of Pharmacy Practice
Pharm.D., 2004, North Dakota State University
Forster, Keith A., Adjunct Professor of Pharmacy Practice
Pharm.D., 1995, North Dakota State University
Frenzel, Jeanne, Assistant Professor of Pharmaceutical Sciences
Pharm.D., 2003, North Dakota State University
Gilspie, Mary A., Adjunct Professor of College of Pharmacy
M.D., 1978, Wayne State School of Medicine
Glunberg, Steven, Adjunct Professor of Pharmacy
M.D., 1981, Washington University
Golman, David S., Adjunct Professor of Pharmacy Practice
Pharm.D., 1981, University of California - San Francisco
Greenwald, Beverly, Assistant Professor of Nursing Ph.D., 1990, North Dakota State University
Grindahl, Kevin, Adjunct Clinical Instructor of Pharmacy Practice B.S., 1984, North Dakota State University
Gross, Carlis J., Associate Professor of Nursing M.S. in Nursing, 1987, University of Kentucky
Gross, Dean, Assistant Professor of Nursing D.N.Sc., 1998, Rush University
Grosz, William J., Adjunct Professor of Pharmacy Practice D.Sc., 1990, North Dakota State University
Guo, Bin, Assistant Professor of Pharmaceutical Sciences Ph.D., 1999, Roswell Park Cancer Institute, University of New York - Buffalo
Hallbur, Kimberly Vess, Associate Professor of Pharmacy Practice; Associate Dean for Student Affairs, College of Pharmacy Ed.D., 1998, University of Cincinnati
Hanel, Harvey J., Adjunct Professor of Pharmacy Practice Pharm.D., 1988, North Dakota State University
Harrington, Agnes E., Emeritus Professor of Pharmacy M.S.Ed., 1949, North Dakota State University
Huang, Karla, Assistant Professor of Nursing M.S., 2005, North Dakota State University
Henderson, William M., Emeritus Professor of Pharmaceutical Sciences Ph.D., 1967, North Dakota State University
Johnson, Kent, Adjunct Clinical Instructor of Pharmacy Practice B.S., 1976, North Dakota State University
Johnson, Todd, Adjunct Professor of Pharmacy Practice Pharm.D., 1976, University of Minnesota
Joyce, Brendan, Adjunct Professor of Pharmacy Practice Pharm.D., 1997, North Dakota State University
Kelsh, Michael, Assistant Professor of Pharmacy Practice Pharm.D., 1999, North Dakota State University
Khalil, Shoukry K.W., Emeritus Professor of Pharmaceutical Sciences Ph.D., 1980, Cairo University, Egypt
Kiser-Larson, Norma, Associate Professor of Nursing Ph.D. in Nursing, 1999, University of Minnesota
Knutson, Paulette, Adjunct Clinical Instructor of Pharmacy Practice M.S., 1988, North Dakota State University
Koo, Ji M., Adjunct Professor of Pharmacy Practice Pharm.D., 1991, North Dakota State University
Larson, Laurelyn, Adjunct Clinical Instructor of Pharmacy Practice B.S., 1976, North Dakota State University
Law, Shek H., Assistant Professor of Pharmaceutical Sciences Ph.D., 2002, University of Manchester, UK
Lee, Margaret S., Assistant Professor of Pharmaceutical Sciences Ph.D., 1996, University of North Dakota
Lehman, Paul, Adjunct Professor of College of Pharmacy, Nursing, and Allied Sciences M.S., 1986, University of Washington
Lundeen, Tina, Assistant Professor of Nursing M.S., 1995, University of Minnesota
Magarian, Edward O., Emeritus Professor of Pharmacy Practice Ph.D., 1964, University of Mississippi
Malik, Sanku, Associate Professor of Pharmaceutical Sciences Ph.D., 1991, Case Western Reserve University
Madsen, Richard J., Adjunct Professor of Allied Sciences M.S., 1974, Texas Tech University
Marsh, Julie A., Adjunct Professor of Allied Sciences M.D., 1994, University of North Dakota
Matheny, Sandra G., Adjunct Professor of Allied Sciences M.S., 1983, University of North Dakota
McCoy, Carol, Adjunct Professor of Allied Sciences Ph.D., 1991, University of Oklahoma
McPherson, Daniel, Adjunct Professor of Pharmacy Practice Pharm.D., 1985, University of Nebraska
McPherson, Debra Johnson, Adjunct Professor of Pharmacy Practice Pharm.D., 1985, University of Nebraska
Merrick, Thomas A., Adjunct Professor of Allied Sciences M.D., 1966, University of Nebraska
Miller, Donald R., Professor of Pharmacy Practice; Department Chair Pharm.D., 1978, University of Michigan
Mooney, Mary Margaret, Professor of Nursing; D.N.Sc., 1986, Catholic University of America
Munoz, Juan M., Adjunct Professor of Pharmacology M.D., 1970, National University of San Marcos, Lima, Peru
Myers, Karen M., Adjunct Professor of Allied Sciences M.A., 1995, University of Colorado
Naughton, Cynthia, Associate Dean for Academic Affairs and Assessment, Assistant Professor of Pharmacy Practice Pharm.D., 1995, North Dakota State University
Nelson, Brien, Lecturer of Pharmacy Practice B.S., 1976, North Dakota State University
Nelson, Robert E., Lecturer of College of Pharmacy Pharm.D., 1997, North Dakota State University
Odegaard, Jacqueline J., Adjunct Professor of Pharmacy Practice Pharm.D., 1986, University of Minnesota
Olig, David J., Adjunct Clinical Instructor of Pharmacy Practice B.S., 1975, North Dakota State University
Olson, Polly M., Lecturer of Allied Sciences, Director M.S., 1993, University of North Dakota
Omvig, Kenton T., Assistant Professor of Pharmacy Practice Pharm.D., 1993, North Dakota State University
O’Rourke, Stephen T., Associate Professor of Pharmaceutical Sciences Ph.D., 1985, University of Wisconsin
Ozbun, Judith M., Emeritus Professor of Pharmacy Practice M.S., 1962, North Dakota State University
Paranaude, Lawrence A. Jr., Assistant Professor of Pharmacy Practice Pharm.D., 2001, North Dakota State University
Patterson, Betty, Emeritus Professor of Pharmacy Practice Ph.D., 1968, University of Iowa
Peterson, Charles D., Professor of Pharmacy Practice; Dean, College of Pharmacy, Nursing, and Allied Sciences Pharm.D., 1977, University of Minnesota
Qadri, Aslam, Adjunct Professor of Allied Sciences M.D., 1970, Liaquat Medical College, Pakistan
Qian, Steven T., Assistant Professor of Pharmaceutical Sciences Ph.D., 1999, University of Iowa
Quan, Danyi, Adjunct Professor of Pharmaceutical Sciences Ph.D., 1981, Hoshi University – Tokyo
Quensenberry, James, Adjunct Professor of Allied Sciences M.D., 1988, University of South Carolina
Rodem, Wanda, Lecturer of Pharmacy Practice B.S., 1974, North Dakota State University
Roehl, Mike, Adjunct Clinical Instructor of Pharmacy Practice B.S., 1978, North Dakota State University
Rogers, James L., Adjunct Professor of Pharmaceutical Sciences Ph.D., 1978, University of Minnesota
Roggensack, Jane, Adjunct Professor of Nursing M.S., 1993, University of North Dakota
Schmitz, Tara, Assistant Professor of Pharmacy Practice Pharm.D., 1995, North Dakota State University
Schnell, R. Craig, Professor of Pharmacology and Toxicology; Provost and Vice President for Academic Affairs Ph.D., 1949, Purdue University
Schulz, Robert, Adjunct Clinical Instructor of Pharmacy Practice B.S., 1987, North Dakota State University
Scott, David, Associate Professor of Pharmacy Practice Pharm.D., 1987, University of Minnesota
Shelver, William H., Emeritus Professor of Pharmaceutical Sciences Ph.D., 1962, University of Virginia
Sheng, Jonathan, Assistant Professor of Pharmaceutical Sciences Ph.D., 1998, State University of New York
Singh, Jagdish, Professor of Pharmaceutical Sciences Ph.D., 1982, Banaras Hindu University, India
Smith, Mary K., Adjunct Professor of Allied Sciences M.S., 1996, University of South Dakota
Sojka, Nadine M., Adjunct Professor of Allied Sciences M.S., 1996, California College of Health Studies
Stenson, Jana, Assistant Professor of Nursing M.S., 1995, University of North Dakota
Stoy, Patrick, Adjunct Professor of Allied Sciences M.D., 1974, University of Minnesota
Strandberg, Kenneth M., Lecturer of Pharmacy Practice M.R.A., 1984, North Dakota State University
Straus, Laurie A., Adjunct Clinical Instructor of Pharmacy Practice B.S., 1982, North Dakota State University
Strommen, Gordon L., Emeritus Professor of Pharmacy Practice Pharm.D., 1984, University of Nebraska
Strom, Patricia, Adjunct Professor of Nursing M.Ed., 1997, North Dakota State University
Sun, Chengwen, Assistant Professor of Pharmaceutical Sciences Ph.D., 1996, Norman Bethune University of Medical Sciences, China
Sylvester, Robert K., Associate Professor of Pharmacy Practice Pharm.D., 1976, University of Minnesota
Thompson, Shila, Assistant Professor of Nursing M.S.N., 2001, University of Mary
Tight, Robert R., Adjunct Professor of Pharmacy M.D., 1967, University of Rochester
Treffline, Robert, Adjunct Clinical Instructor of Pharmacy Practice B.S., 1969, North Dakota State University
Urlacher, Robyn, Adjunct Professor of Allied Sciences B.S., 1998, North Dakota State University
Vincent, Murit C., Emeritus Professor of Pharmacy Practice Ph.D., 1955, University of Washington
Welch, Justin, Lecturer of Pharmacy Practice Pharm.D., 1998, North Dakota State University
Wentz, Melissa, Adjunct Clinical Instructor of Pharmacy Practice B.S., 1992, North Dakota State University
Wettremyer, Amy, Assistant Professor of Pharmacy Practice Pharm. D., 2005, North Dakota State University
Wilhelm, Ross, Assistant Professor of Pharmacy Practice Pharm.D., 1998, North Dakota State University
Wolf, Pamala, Adjunct Professor of Pharmacy Practice Pharm.D., 1999, North Dakota State University
Wright, Mary, Associate Dean for Nursing and Allied Sciences, Associate Professor of Nursing Ph.D., 1988, University of Texas

College of Science and Mathematics

Aldrich-Wolfe, Laura, Adjunct Professor of Biological Sciences Ph.D., 2006, Cornell University
Allfonseca, Maria, Assistant Professor of Mathematics Ph.D., 2003, Universidad Autonoma de Madrid, Spain
Allahar, Kenny, Research Assistant Professor of Coatings and Polymeric Materials Ph.D., 2003, University of Florida
Anderson, Noel W., Adjunct Professor of Computer Science Ph.D., 1988, Iowa State University
Ashworth, Allan C., University Distinguished Professor and James A. Meier Professor of Geology Ph.D., 1969, University of Birmingham, England
Babakhanyan, Nikita, Professor of Mathematics Ph.D., 1979, Leningrad University, Russia
Baker, William T., Adjunct Professor of Biological Sciences Ph.D., 1968, University of Kansas
Battocchi, Dante, Adjunct Professor of Coatings and Polymeric Materials Ph.D., 2002, University of Trento, Italy
Bierwagen, Gordon, Professor of Coatings and Polymeric Materials Ph.D., 1968, Iowa State University
Biggs, Peggy, Assistant Professor of Biological Sciences
Ph.D., 2003, University of Idaho
Blakelee, Barbara, Research Professor of Psychology
Ph.D., 1983, University of California, Santa Barbara
Bleier, William J., Distinguished Professor of Biological Sciences; Department Head
Ph.D., 1975, Texas Tech University
Bocca, Mariam, Assistant Professor of Mathematics
Ph.D., 2004, Carnegie Mellon University
Boudjouk, Philip, Distinguished Professor of Chemistry
Ph.D., 1971, University of Wisconsin, Madison
Brady, Mark, Assistant Professor of Psychology
Ph.D., 1999, University of Minnesota
Brammer, J.D., Emeritus Professor of Biological Sciences
Ph.D., 1968, Purdue University
Braun, Juergen, Professor Emeritus of Coatings and Polymeric Materials
Ph.D., 1956, University of Texas
Brophy, John A., Emeritus Professor of Geology
Ph.D., 1958, University of Illinois
Buckner, James S., Adjunct Professor of Chemistry and Molecular Biology
Ph.D., 1971, North Dakota State University
Buitron, Deborah P., Adjunct Professor of Biological Sciences
Ph.D., 1982, University of Minnesota
Burghaus, Uwe, Assistant Professor of Chemistry and Molecular Biology
Ph.D., 1995, Free University Berlin, 1995
Butler, Malcolm G., Professor of Biological Sciences
Ph.D., 1980, University of Michigan
Calvo, Jorge, Adjunct Professor of Mathematics
Ph.D., 1998, University of California - Santa Barbara
Carlson, Robert B., Adjunct Professor of Statistics
Ph.D., 1965, Michigan State University
Cheng, Fu-chih, Assistant Professor of Statistics
Ph.D., 2003, North Dakota State University
Chisholm, Brett, Adjunct Professor of Coatings and Polymeric Materials
Ph.D., 1993, Southern Mississippi University
Ciuperca, Catalin, Assistant Professor of Mathematics
Ph.D., 2001, University of Kansas
Clambe, Gary K., Associate Professor of Biological Sciences
Ph.D., 1975, Iowa State University
Clark, Mark E., Assistant Professor of Biological Sciences
Ph.D., 1996, University of Tennessee
Coleman, Martin, Assistant Professor of Psychology
Ph.D., 2005, University of Sussex
Comer, Dogan, Professor of Mathematics
Ph.D., 1983, University of Toronto, Canada
Cook, Gregory, Professor of Chemistry and Molecular Biology
Ph.D., 1993, Michigan State University
Conce, Harry B., Adjunct Professor of Mathematics
Ph.D., 1969, University of Delaware
Cope, Davis, Associate Professor of Mathematics
Ph.D., 1980, Vanderbilt University
Council, James R., Professor of Psychology
Ph.D., 1984, University of Connecticut
Coykendall, James, James A. Meier Professor of Mathematics; Department Chair
Ph.D., 1995, Cornell University
Crook, Stuart G., Professor of Coatings and Polymeric Materials, Department Chair, Adjunct Professor of Physics
Ph.D., 1974, University of Leeds, U.K.
Crosby, Ross D., Adjunct Professor of Psychology
Ph.D., 1989, University of Nevada, Reno
Davis, David G., Adjunct Professor of Biological Sciences
Ph.D., 1965, Washington State University
Degges, Ronald C., Senior Lecturer of Statistics
M.S., 1995, North Dakota State University
Denton, Alan R., Associate Professor of Physics
Ph.D., 1991, Cornell University
Denton, Anne, Assistant Professor of Computer Science
Ph.D., 1996, University of Mainz, Germany
Do, Hyoungsoon, Assistant Professor of Computer Science and Operations Research
Ph.D., 2007, University of Nebraska-Lincoln
Donohue, Keith, Research Assistant Professor of Psychology
Ph.D., 2008, Florida State University
Dorsam, Glenn, Assistant Professor of Chemistry and Molecular Biology
Ph.D., 1998, Virginia Commonwealth University
Dorsam, Sheri, Research Assistant Professor of Chemistry and Molecular Biology
Ph.D., 1998, Virginia Commonwealth University
Du, Xiaojiang (James), Assistant Professor of Computer Science and Operations Research
Ph.D., 2003, University of Maryland, College Park
Duncan, Benton, Assistant Professor of Mathematics
Ph.D., 2004, University of Nebraska - Lincoln
Duysen, Murray E., Emeritus Professor of Biological Sciences
Ph.D., 1966, University of Nebraska
Erfanian, Nazrin, Adjunct Professor of Psychology
Ph.D., 1995, University of North Dakota
Erickson, D. Bruce, Emeritus Professor of Computer Science
Ph.D., 1973, Yale University
Eslinger, Theodore L., Professor of Biological Sciences
Ph.D., 1974, Duke University
Euliss, Ned, Adjunct Professor of Biological Sciences
Ph.D., 1989, Oregon State University
Fawley, Marvin W., Adjunct Professor of Biological Sciences
Ph.D., 1985, Miami University
Fawley, Karen, Adjunct Professor of Biological Sciences
Ph.D., 1998, North Dakota State University
Fischer, Allan G., Emeritus Dean and Emeritus Professor of Biochemistry and Molecular Biology
Ph.D., 1966, Indiana University
Fitzgerald, Margaret, Assistant Dean, Associate Professor of Child Development and Family Science
Ph.D., 1997, Iowa State University
Frank, Albert B., Adjunct Professor of Biological Sciences
Ph.D., 1969, North Dakota State University
Frieze, Charles R., Emeritus Professor of Mathematics
M.S., 1958, North Dakota State University
Friesen, Chris, Assistant Professor of Psychology
Ph.D., 2001, University of Alberta
Galitz, Donald S., Emeritus Professor of Biological Sciences
Ph.D., 1961, University of Illinois
Gammill, Robert C., Emeritus Professor of Computer Science
Ph.D., 1969, Massachusetts Institute of Technology
Garvey, Roy G., Emeritus Professor of Chemistry and Molecular Biology
Ph.D., 1966, University of Utah
Gelling, Victoria Johnston, Assistant Professor of Coatings and Polymeric Materials
Ph.D., 2001, North Dakota State University
Gephard, Matthew S., Adjunct Professor of Coatings and Polymeric Materials
Ph.D., 1990, Stanford University
Gerst, Jeffrey W., Professor of Biological Sciences
Ph.D., 1973, University of Nebraska
Glass, J. Edward, Adjunct Professor of Coatings and Polymeric Materials
Ph.D., 1964, Purdue University
Gordon, Kathryn H., Assistant Professor of Psychology
Ph.D., 2008, Florida State University
Gordon, Robert, Assistant Professor of Psychology
Ph.D., 1999, University of Illinois at Urbana - Champaign
Gordon, Wendy, Assistant Professor Psychology
Ph.D., 2002, University of Illinois at Urbana - Champaign
Greenlee, Kendra, Assistant Professor of Biological Sciences
Ph.D., 2004, Arizona State University
Grier, James W., Emeritus Professor of Biological Sciences
Ph.D., 1975, Cornell University
Gu, Yan, Assistant Professor of Computer Science and Operations Research
Ph.D., 2007, Georgia Institute of Technology
Hakk, Heldur, Adjunct Professor of Chemistry and Molecular Biology
Ph.D., 1997, North Dakota State University
Hammond, James J., Adjunct Professor of Statistics
Ph.D., 1969, University of Nebraska
Hammond, Richard, Adjunct Professor of Physics
Ph.D., 1979, Rensselaer Polytechnic Institute
Hanson, Mark A., Adjunct Professor of Biological Sciences
Ph.D., 1990, North Dakota State University
Harling, Ferdinand, Emeritus Professor of Mathematics
M.S., 1962, Illinois Institute of Technology
Harling, Stuart, Assistant Professor of Chemistry and Molecular Biology
Ph.D., 2004, University of Iowa
Hass, Linnie D., Senior Lecturer of Mathematics
M.A., 1972, University of Illinois
Hatzenbuhler, Elaine C., Senior Lecturer of Geosciences
B.S., 1971, Kansas State University
Heilmann, Larry J., Adjunct Professor of Chemistry and Molecular Biology
Ph.D., 1984, Wesleyan University
Hersberger, John F., Professor of Chemistry and Molecular Biology; Department Chair
Ph.D., 1986, Yale University
Hill, Loren, Adjunct Professor of Coatings and Polymeric Materials
Ph.D., 1965, Pennsylvania State University
Hilmert, Clayton J., Assistant Professor of Psychology
Ph.D., 2003, University of California - San Diego
Hindelis, Brian, Research Assistant Professor of Coatings and Polymeric Materials
Ph.D., 2000, University of Virginia
Hintz, Velin B., Professor of Psychology
Ph.D., 1983, University of Illinois
Hodg, Angela, Assistant Professor of Mathematics
Ph.D., 2007, Purdue University
Ilke, Thomas, Assistant Professor of Physics
Ph.D., 1996, Technical University of Aachen
Jacob, Donna, Research Assistant Professor of Biological Sciences
Ph.D., 2004, University College Dublin
Jacobson, Denley B., Associate Professor of Chemistry and Molecular Biology
Ph.D., 1984, Purdue University
Jin, Wei, Assistant Professor of Computer Science
Ph.D., 2008, State University of New York at Buffalo
Johnston, Dana L., Emeritus Senior Lecturer of Computer Science
M.S., 1988, University of Denver
Johnson, Douglas H., Adjunct Professor of Biological Sciences
Ph.D., 1986, North Dakota State University
Johnson, Ivan M., Adjunct Professor of Biological Sciences
Ph.D., 1969, University of Montana
Johnson, Kenneth R., Emeritus Professor of Mathematics
Ph.D., 1980, University of Colorado
Kang, Qingsh, Assistant Professor of Statistics
Ph.D., 2005, Kansas State University
Kaster, Jessica, Adjunct Professor of Psychology
Ph.D., 2004, University of North Dakota
Kenyon, Mary Jo, Senior Lecturer of Biological Sciences
M.S., 1997, North Dakota State University
Kililea, S. Derek, Professor of Chemistry and Molecular Biology
Ph.D., 1972, National University of Ireland, Galway, Ireland
Kolka, Randall, Adjunct Professor of Biological Sciences
Ph.D., 1996, University of Minnesota
Kornfeld, Isaac, Emeritus Professor of Mathematics
Ph.D., 1975, Technion State University, Uzbekistan
Kroll, Daniel, Professor of Physics, Department Head
Ph.D., 1973, University of Chicago
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>University and Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickell, Gary S.</td>
<td>Adjunct Professor of Chemistry</td>
<td>University of Minnesota, 1980</td>
</tr>
<tr>
<td>Nelson, Gilbert W.</td>
<td>Emeritus Professor of Mathematics</td>
<td>Air Force Institute of Technology, 1974</td>
</tr>
<tr>
<td>Nicell, Gary S.</td>
<td>Adjunct Professor of Psychology</td>
<td>University of Oklahoma, 1982</td>
</tr>
<tr>
<td>Nuechterlein, Gary L.</td>
<td>Emeritus Professor of Biological Sciences</td>
<td>University of Minnesota, 1980</td>
</tr>
<tr>
<td>Nugent, Kendall E.</td>
<td>Professor of Computer Science</td>
<td>Virginia Polytechnic Institute and State University, 1978</td>
</tr>
<tr>
<td>Oduor, Peter</td>
<td>Assistant Professor of Geology</td>
<td>University of Missouri - Rolla, 2004</td>
</tr>
<tr>
<td>Offerdal, Erika</td>
<td>Assistant Professor of Chemistry and Molecular Biology</td>
<td>University of Arizona, 2008</td>
</tr>
<tr>
<td>Olsen, Arland E.</td>
<td>Emeritus Professor of Biochemistry and Molecular Biology</td>
<td>University of Minnesota, 1963</td>
</tr>
<tr>
<td>Olsen, James H.</td>
<td>Professor of Mathematics</td>
<td>University of Minnesota, 1968</td>
</tr>
<tr>
<td>Olson, Lloyd D.</td>
<td>Emeritus Professor of Mathematics</td>
<td>North Dakota State University, 1973</td>
</tr>
<tr>
<td>O’Neill, George P.</td>
<td>Adjunct Professor of Psychology</td>
<td>Georgia State University, 1974</td>
</tr>
<tr>
<td>O’Neill, H.K.</td>
<td>Assistant Professor of Psychology</td>
<td>University of North Dakota, 1991</td>
</tr>
<tr>
<td>Ostafin, Brian</td>
<td>Assistant Professor of Psychology</td>
<td>University of North Dakota, 2004</td>
</tr>
<tr>
<td>Otto, Marinos</td>
<td>Professor of Biological Sciences, Department Head</td>
<td>Free University of Amsterdam, 1991</td>
</tr>
<tr>
<td>Page, Michiel</td>
<td>Associate Professor of Chemistry and Molecular Biology</td>
<td>State University of New York, 1982</td>
</tr>
<tr>
<td>Park, Ernest</td>
<td>Adjunct Professor of Psychology</td>
<td>Michigan State University, 2003</td>
</tr>
<tr>
<td>Pavicic, Mark J.</td>
<td>Adjunct Professor of Computer Science</td>
<td>Columbia University, 1985</td>
</tr>
<tr>
<td>Perrino, William K.</td>
<td>University Distinguished Professor, Jordan</td>
<td>University of Amsterdam, 1972</td>
</tr>
<tr>
<td>Peterka, John J.</td>
<td>Emeritus Professor of Biological Sciences</td>
<td>University of Minnesota, 1964</td>
</tr>
<tr>
<td>Pokhodnya, Konstantin</td>
<td>Adjunct Professor of Chemistry and Molecular Biology</td>
<td>Oregon State University, 1964</td>
</tr>
<tr>
<td>Popovic, Cristina</td>
<td>Assistant Professor of Mathematics</td>
<td>Carnegie Mellon University, 2005</td>
</tr>
<tr>
<td>Provider, Theodore</td>
<td>Adjunct Professor of Coatings and Polymeric Materials</td>
<td>University of Wisconsin, 1965</td>
</tr>
<tr>
<td>Puyaret, Robert L.</td>
<td>Emeritus Professor of Biological Sciences</td>
<td>Oregon State University, 1964</td>
</tr>
<tr>
<td>Rainville, Stéphane J.</td>
<td>Assistant Professor of Psychology</td>
<td>McGill University, 2000</td>
</tr>
<tr>
<td>Rao, M. Bhaskara</td>
<td>Emeritus Professor of Statistics, Adjunct Professor of Mathematics</td>
<td>Indian Statistical Institute, 1973</td>
</tr>
<tr>
<td>Rasmussen, Seth C.</td>
<td>Associate Professor of Chemistry and Molecular Biology</td>
<td>Carnegie Mellon University, 1994</td>
</tr>
<tr>
<td>Reed, Wendy</td>
<td>Assistant Professor of Biological Sciences</td>
<td>Iowa State University, 2000</td>
</tr>
<tr>
<td>Reinell, Katie</td>
<td>Assistant Professor of Biological Sciences</td>
<td>North Dakota State University, 2006</td>
</tr>
<tr>
<td>Reiser, Mary</td>
<td>Adjunct Professor of Biological Sciences</td>
<td>Arizona State University, 1988</td>
</tr>
<tr>
<td>Richardson, J.L.</td>
<td>Adjunct Professor of Geosciences</td>
<td>Iowa State University, 1974</td>
</tr>
<tr>
<td>Robinson, Michael D.</td>
<td>James A. Meier Associate Professor of Psychology</td>
<td>University of California, Davis, 1996</td>
</tr>
<tr>
<td>Rodgers, Kenton R.</td>
<td>Professor of Chemistry and Molecular Biology</td>
<td>University of Iowa, 1988</td>
</tr>
<tr>
<td>Roseler, Richard R.</td>
<td>Adjunct Professor of Coatings and Polymeric Materials</td>
<td>University of Washington, 1969</td>
</tr>
<tr>
<td>Rokke, Paul D.</td>
<td>Professor of Psychology, Department Chair</td>
<td>University of Houston, 1985</td>
</tr>
<tr>
<td>Roulledge, Clay</td>
<td>Assistant Professor of Psychology</td>
<td>University of Missouri-Columbia, 2005</td>
</tr>
<tr>
<td>Rudesill, James T.</td>
<td>Emeritus Professor of Chemistry and Molecular Biology</td>
<td>Purdue University, 1957</td>
</tr>
<tr>
<td>Saini-Eidukat, Bernhardt</td>
<td>Associate Professor of Geology</td>
<td>University of Helsinki, Finland, 1994</td>
</tr>
<tr>
<td>Sather-Wagstaff, Sean</td>
<td>Assistant Professor of Statistics</td>
<td>University of Michigan, 1997</td>
</tr>
<tr>
<td>Sawicki, Charles A.</td>
<td>Associate Professor of Physics</td>
<td>University of Connecticut, 1975</td>
</tr>
<tr>
<td>Schwert, Donald P.</td>
<td>Professor of Geology, Director, Center for Science, Mathematics, Engineering and Technology Education</td>
<td>University of Waterloo, Canada, 1978</td>
</tr>
<tr>
<td>Scoby, Donald R.</td>
<td>Emeritus Professor of Biological Sciences</td>
<td>North Dakota State University, 1968</td>
</tr>
<tr>
<td>Shappell, Nancy</td>
<td>Adjunct Professor of Biological Sciences</td>
<td>Virginia Polytechnic Institute and State University, 1988</td>
</tr>
<tr>
<td>Sheridan, Mark A.</td>
<td>James A. Meier Professor of Biological Sciences</td>
<td>University of California, Berkeley, 1985</td>
</tr>
<tr>
<td>Shreve, Warren E.</td>
<td>Professor of Mathematics, Department Chair</td>
<td>University of Nebraska, 1967</td>
</tr>
<tr>
<td>Sibi, Mukund P.</td>
<td>Distinguished and James A. Meier Professor of Chemistry and Molecular Biology</td>
<td>City University of New York, 1980</td>
</tr>
<tr>
<td>Sinha, Mahendra K.</td>
<td>Emeritus Professor of Physics</td>
<td>Pennsylvania State University, 1961</td>
</tr>
<tr>
<td>Sivaguru, Jayaraman</td>
<td>Assistant Professor of Chemistry and Molecular Biology</td>
<td>University of Nebraska, 2003</td>
</tr>
<tr>
<td>Skerry, Brian</td>
<td>Adjunct Professor of Coatings and Polymeric Materials</td>
<td>University of Manchester, U.K., 1980</td>
</tr>
<tr>
<td>Skogen, Madeleine K.</td>
<td>Emeritus Professor of Mathematics</td>
<td>North Dakota State University, 1960</td>
</tr>
<tr>
<td>Slaughter, William D.</td>
<td>Adjunct Professor of Statistics</td>
<td>Cornell University, 1975</td>
</tr>
<tr>
<td>Slater, Brian M.</td>
<td>Professor of Computer Science, Department Head</td>
<td>New Mexico State University, 1988</td>
</tr>
<tr>
<td>Sparks, Robert B.</td>
<td>Associate Professor Emeritus of Chemistry and Molecular Biology</td>
<td>University of South Dakota, 1972</td>
</tr>
<tr>
<td>Srivastava, D.K.</td>
<td>Professor of Chemistry and Molecular Biology</td>
<td>University of California, Berkeley, 1980</td>
</tr>
<tr>
<td>Stockwell, Craig A.</td>
<td>James A. Meier Associate Professor of Biological Sciences</td>
<td>University of Nevada, Reno, 1995</td>
</tr>
<tr>
<td>Sugihara, James M.</td>
<td>Emeritus Professor of Chemistry and Molecular Biology</td>
<td>University of Utah, 1947</td>
</tr>
<tr>
<td>Sun, Wenfang</td>
<td>Associate Professor of Chemistry and Molecular Biology</td>
<td>Institute of Photochemical Science, Chinese Academy of Science, 1995</td>
</tr>
<tr>
<td>Suttle, Jeffrey C.</td>
<td>Adjunct Professor of Biological Sciences</td>
<td>Michigan State University, 1979</td>
</tr>
<tr>
<td>Swenson, Rodney</td>
<td>Adjunct Professor of Psychology</td>
<td>University of North Dakota, 1985</td>
</tr>
<tr>
<td>Swenson, Orven E.</td>
<td>Associate Professor of Physics</td>
<td>Air Force Institute of Technology, 1952</td>
</tr>
<tr>
<td>Tallman, Dennis E.</td>
<td>Research Professor of Coatings and Polymeric Materials</td>
<td>Ohio State University, 1968</td>
</tr>
<tr>
<td>Tang, Jingpeng</td>
<td>Adjunct Professor of Computer Science</td>
<td>University of North Dakota, 2002</td>
</tr>
<tr>
<td>Taylor, Larry D.</td>
<td>Senior Lecturer of Mathematics</td>
<td>Michigan State University, 1997</td>
</tr>
<tr>
<td>Tedes-Sälejärvi, Wolfgang A.</td>
<td>Associate Professor of Psychology</td>
<td>Finland, 1994</td>
</tr>
<tr>
<td>Terpstra, Jeffrey T.</td>
<td>Associate Professor of Statistics</td>
<td>Western Michigan University, 1997</td>
</tr>
</tbody>
</table>
Travers, Steven, Assistant Professor of Biological Sciences
Ph.D., 1998, University of California, Santa Barbara

Tucker, Robert, Adjunct Professor of Chemistry
and Molecular Biology
Ph.D., 1967, Iowa State University

Ubbaya, Vasant A., Professor of Computer Science
Ph.D., 1971, University of California, Berkeley

Ungar, Abraham A., Professor of Mathematics
Ph.D., 1973, Tel Aviv University, Israel

Vahl, Christopher, Assistant Professor of Statistics
Ph.D., 2005, Kansas State University

Van Amburg, Gerald L., Adjunct Professor of Biological Sciences
Ph.D., 1969, Texas A&M University

Vick, Brady A., Adjunct Professor of Chemistry
and Molecular Biology
Ph.D., 1975, North Dakota State University

Vinograd, Robert E., Emeritus Professor of Mathematics
Ph.D., 1952, Moscow State University
D.Sc., 1960, Moscow State University, Russia

Voronov, Andriy, Assistant Professor of Coatings
and Polymeric Materials
Ph.D., 1994, Lviv Polytechnic Institute, Ukraine

Wagner, Alexander, Associate Professor of Physics
Ph.D., 1997, Oxford University

Webster, Dean C., Professor of Coatings and Polymeric Materials
Ph.D., 1984, Virginia Polytechnic Institute and State University

Wettstein, Greg, Adjunct Professor of Computer Science
Ph.D., 1988, North Dakota State University

White, Alan R., Adjunct Professor of Biological Sciences
Ph.D., 1981, University of North Carolina

Wisenden, Brian, Adjunct Professor of Biological Sciences
Ph.D., 1993, University of Western Ontario

Withnell, Gary D., Adjunct Professor of Physics
Ph.D., 1980, North Dakota State University

Wittrock, David A., Professor of Psychology
Ph.D., 1990, State University of New York, Albany

Wonderlich, Stephen A., Adjunct Professor of Psychology
Ph.D., 1985, University of Missouri

Xu, Dianxiang, Assistant Professor of Computer Science
Ph.D., 1995, Nanjing University, China

Zhang, Weiyi, Assistant Professor of Computer Science and
Operations Research
Ph.D., 2007, Arizona State University

Zhao, Pinjing, Assistant Professor of Chemistry
and Molecular Biology
Ph.D., 2003, Cornell University