NDSU

2010-2012
Graduate School Bulletin

NDSU in Perspective

A Bit of History

On March 8, 1890, the state's first governor, John Miller, signed the bill designating the land to establish a college of agriculture and mechanic arts, the North Dakota Agricultural College, as a part of the Morrill Act of 1862. In 1960, the name was changed to North Dakota State University.

The Graduate School

Graduate students were first accepted in 1895, and a formal announcement of graduate studies has been carried in the bulletins since 1902.

The Graduate School was formalized July 1, 1954, by approval of the North Dakota Board of Higher Education. Graduate studies were administered by a Graduate Council from November 1949 to June 1954, and before that by a Graduate Committee.

The first Master of Science degree was awarded in 1899. Since then, graduate students have been in regular attendance and have participated in the scholarly activity of the campus. The number of degrees awarded increased noticeably after 1920 and again after 1950 in reflection of general trends in higher education in the United States.

In 1959, the North Dakota Board of Higher Education first authorized certain departments to offer the Doctor of Philosophy degree. The first Ph.D. degrees were awarded in 1963.

NDSU Today

North Dakota State University is the state's first Morrill Act land-grant institution. Located on the state's eastern border in Fargo, North Dakota's largest city, the university strives to be a leader in information systems, technology transfer, economic development, and lifelong learning; and encompasses a broad spectrum of curricular offerings, scholarly activity, and service. It is one of two major research universities in an eleven-institution state university system.

NDSU has enjoyed steady enrollment growth for the past decade. Current enrollment is over 14,000 students on the campus in Fargo. Over 2,100 are gradutae students. NDSU also serves several thousand people throughout the state in continuing education and extension programs. Instruction is carried out in nine academic units: the Colleges of Agriculture, Food Systems, and Natural Resources; Arts, Humanities, and Social Sciences; Business Administration; Engineering and Architecture; Human Development and Education; Pharmacy; Science and Mathematics; University Studies; and the Graduate School.

NDSU has 44 doctoral and professional programs, 63 master's degree programs, 10 certificate programs and 102 bachelor's degree programs. The North Dakota Agricultural Experiment Station and NDSU Extension Service are integral parts of the University.

NDSU participates in the Tri-College University consortium with neighboring Minnesota State University Moorhead and Concordia College. NDSU has approximately 1,500 staff members and 950 faculty and academic staff.

The Fargo-Moorhead Community

Named one of the most desirable places in the country to live by Money magazine, Fargo is quietly earning a reputation as a perfect place to make a home. Nestled in the rich farmlands of the Red River Valley, the Fargo-Moorhead community has many qualities that contribute to this reputation, including a highly respected educational system; advanced medical technology; a progressive business community; numerous cultural and arts opportunities; clean air and water; and good-hearted, friendly people.

With more than 163,000 people in the community and about 500,000 people in the service area, Fargo-Moorhead is among the largest metropolitan centers between Minneapolis and Seattle. One of the reasons people choose NDSU as a place to get a good education is that the F-M community provides students access to part-time jobs, internships, parks and other recreational facilities, entertainment, and cultural amenities.

Graduate Facilities

Opportunities for graduate study are available in seven colleges including the School of Education. Many departments have long records of strong graduate offerings. An active program of physical plant improvement has provided greatly expanded facilities for graduate

work. A study of the level and location of degrees earned by the graduate faculty attests to the caliber of instruction maintained.

Cooperating agencies such as the Institute for Regional Studies, the Agricultural Experiment Station, and the United States Department of Agriculture provide unusually fine opportunities for research experience, for the selection of disquisition topics, and for guidance in the preparation of the disquisition. These agencies also provide opportunities for part-time employment for a number of graduate students.

Tri-College University

Tri-College University is a consortium of the three Fargo-Moorhead institutions of higher education: North Dakota State University, Concordia College, and Minnesota State University Moorhead. Through the Tri-College course exchange, students can take courses on the other two campuses without going through separate admissions procedures. Tuition is paid only to the home school. Guidelines are available in the general NDSU Bulletin and from the registrar. Bus service is provided among the campuses daily during the academic year.

Reciprocal parking arrangements are available for students who wish to drive to the other schools.

Students may use the library resources of all three schools. This highly effective sharing of library resources is facilitated by a combined serials listing and twice-daily delivery service.

Several academic programs are conducted jointly by the three schools. Master of Science, Master of Education, and Educational Specialist degrees in Educational Leadership are offered through the Tri-College University. The scope of opportunities for students is expanded by the sharing and coordination of programs and services among the many academic departments within the three schools.

Continuing Education

Continuing Education is an outreach unit of the university that makes the resources of the institution available in a variety of ways, including distance-based education. Courses, locations, and delivery systems are planned in response to requests and identified needs.

Continuing Education activities fall into three main categories: on- and off-campus credit courses, non-credit activities, and learning opportunities mediated via technology. Admission to NDSU is required to enroll in Continuing Education courses, which are numbered 601 or above. Individuals interested in enrolling in degree eligible credit activities must complete application procedures through the Graduate School.

Administration of Graduate Studies

Accreditation

North Dakota State University is accredited at the doctoral level by the Commission on Colleges and Universities of the North Central Association of Colleges and Secondary Schools.

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 nine-member State Board of Higher Education is the policy-setting body for the North Dakota University System and consists of seven citizen members who serve four-year terms and who are appointed by the governor, one student who is also appointed by the governor for a one-year term, and one faculty member who is selected by the Council of College Faculties.

TOEFL or International English Language Testing System (IELTS) Scores

NDSU requires a minimum TOEFL score of 525 (paper-based) or 71 (Internet-based). The mimimum IELTS score required is 5.5. For more information about the TOEFL click **here**. For more information about IELTS, click **here**.

Department	Paper-based	Internet-based	IELTS
Accountancy	550	79	6
Agricultural & Biosystems Engineering	550	79	6
Agricultural Economics	550	79	6
Anthropology	600	100	7
Biochemistry & Molecular Biology	600	100	7
Biology	550	79	6
Botany	550	79	6
Business Administration	550	79	6
Cereal Science	550	79	6
Chemistry	600	100	7
Coatings & Polymeric Materials	550	79	6
Communication	600	100	7
Computer Science	550	79	6
Engineering Ph.D.	550	79	6
English	600	100	7
Entomology	550	79	6
Environmental & Conservation Sciences	550	79	6
History	600	100	7
Industrial & Manufacturing Engineering	550	79	6
Pharmaceutical Sciences	550	79	6
Physics	550	79	6
Plant Pathology	550	79	6
Political Science	600	100	7

Department	Paper-based	Internet-based	IELTS
Software Engineering	550	79	6
Statistics	550	79	6
Zoology	550	79	6

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 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.

Disclaimer

The purpose of this bulletin is to provide information about the graduate programs of North Dakota State University. It should not be considered an offer or a contract. While every effort has been made to make this information as complete and accurate as possible, it should be noted that changes may occur at any time in the requirements, course offerings, fees, etc. listed in this bulletin. However, students are allowed to meet the degree requirements in effect at the time of first enrollment as a degree-seeking student, provided the student is able to complete the degree requirements reflected in the appropriate bulletin within the stated time frame and the student has maintained continuous enrollment status.

Equal Opportunity Statement

North Dakota State University does not discriminate on the basis of age, color, disability, gender identity, marital status, national origin, public assistance status, sex, sexual orientation, status as a U.S. veteran, race or religion. Direct inquiries to the Vice President for Equity, Diversity and Global Outreach, 205 Old Main, (701)231-7708.

Accreditation

North Dakota State University is accredited as an institution by the North Central Association of Colleges and Secondary Schools. Inquiries may be directed to the North Central Association of Colleges and Schools Commission on Institutions of Higher Education, 30 North LaSalle St., Suite 2400, Chicago, IL 60602-2504. (tel. 1-800-621-7440). In addition, many programs are accredited or approved by their respective professional organizations and agencies.

Privacy of Records

The disclosure of student educational records is governed by policies developed by North Dakota State University in compliance with state law and the Family Educational Rights and Privacy Act of 1974 as amended (FERPA).

There are essentially two types of student records, public directory information and nonpublic information. Directory information may be released publicly except in cases where students have specifically requested that the information not be released. Nonpublic information, which includes the academic transcript, is considered confidential and will not be released, other than to authorized personnel or as allowed by law, without the written authorization of the individual. University policies relative to student records are specified in the FERPA annual notice, the "NDSU Policy Manual" Section 600, and at **http://www.ndsu.nodak.edu/policy/600.htm**, and contained in the publication titled "Rights & Responsibilities of Community: A Code of Student Behavior," which may be obtained from the Office of Student Affairs, 100 Old Main. Students may restrict the release of directory information no later than the tenth class day of the semester at Registration and Records, 110 Ceres.

General Policies

Scholastic Standards

To be in academic good standing and to receive a graduate degree, a student must have a cumulative grade point average (GPA) of at least 3.0.

All courses taken by a graduate student for which grades are given will be used in calculating the grade point average, except where a course has been repeated. Both grades will appear on the transcript, but only the second grade will be used in calculating the grade point average. (A specific course can be retaken only once, and only three total courses can be retaken). Satisfactory or Unsatisfactory is assigned for research credits, and they are not used in calculating the GPA.

In fulfilling graduate course requirements on any plan of study, only grades of A, B, or C are acceptable. For master's paper (797), master's thesis (798), and doctoral dissertation (799), only the grade of satisfactory (S) is acceptable. For seminar (790), case studies (792), individual study/tutorial (793), practicum/internship (794), or field experience (795), only grades of A, B, C, or S are acceptable for graduate credit.

Programs and/or supervisory committees may require a higher performance than C in certain courses. While some courses may be used for graduate credit with a grade of C, courses with grades of D, F, and U may not be used for graduate credit. Acquisition of more than two grades of C, D, F and U may be grounds for dismissal upon recommendation by the program administrator.

These minimal scholastic requirements apply to each student enrolled in the Graduate School. Additional requirements may exist for certain graduate programs.

Academic Warning

Any student in GOOD STANDING whose cumulative grade point average drops to less than 3.0 at any time of attendance is automatically placed on academic WARNING. Any student admitted in CONDITIONAL status because of grade deficiency is automatically placed on academic WARNING. If a student on academic WARNING fails to achieve a cumulative grade

point average of at least 3.0 in the subsequent semester of attendance, then the student will be placed on academic PROBATION.

Academic Probation

A student on academic PROBATION may not continue the pursuit of the graduate degree program without a waiver from the Dean of the Graduate School acting on a recommendation from the appropriate program administrator. This recommendation must include a review of the student's status and a proposed plan of remediation which will allow the student an opportunity to return to a cumulative grade point average of at least 3.0 within one additional semester. If the cumulative grade point average is not at least 3.0 after this one additional semester, the student will be dismissed from his or her graduate program.

A student on academic PROBATION is not eligible for a graduate assistantship or tuition waiver.

Enrollment Status

Nine credits are considered a full-time graduate load. To receive financial aid, students must be enrolled at least half-time (ie 5 credits). Loan deferment may also require full or half-time status. Eligibility varies with financial aid programs and students should contact their lender for requirements.

Graduate Assistants working 20 hours per week are considered full-time if registered for five or more graduate credits. Federal law requires all international students with a 20-hour per week assistantship to carry at least six graduate credits for full-time status. Graduate students wishing to register for more than 15 credits in a regular semester shall secure the approval of their department chair and the Dean of the Graduate School.

Graduate Courses

Courses approved at the 600 and 700 level may be taken for graduate credit and used to satisfy course requirements on the student's graduate plan of study. Didactic courses are those courses approved for graduate credit numbered 601-689, 691, 700-789 and 791. Courses numbered 690, 692-699, 790, and 792-799 are considered special or experimental courses and are not to be included as didactic courses on a 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.

Continuing Education Graduate Courses

Graduate courses administered through the Office of Distance and Continuing Education (DCE) are eligible for graduate degree plans of study if they carry a permanent course number, or the 691/791 or 696/796 designation. Courses numbered 691/791 are trial courses and course numbered 696/796 are special topic courses; courses 691/791 are viewed as didactic courses. The 696/796 courses can be counted as didactic courses if they are later approved as permanent courses. Graduate tuition waiver does not cover DCE courses.

Courses designed for professional advancement are given the number 600. Although such courses are considered graduate level, they cannot be included on NDSU graduate degree plans of study.

Course instructors must be full or associate members of the NDSU graduate faculty or approved in advance by the administrator of the unit whose course prefix is used, the appropriate academic dean, and the Graduate Dean.

Registration for Research Credit

A student conducting research for the disquisition is to be enrolled in 797, 798, or 799 for the number of credits specified on the plan of study. If a student's program has a cap on the number of 797, 798 or 799 credits that may be earned in the pursuit of degree, the student is to register for 797R, 798R, or 799R (or regular credit at the discretion of the host Program) during each semester in which the student uses faculty consultation and/or University facilities and/or University administration. Such registration is required even in absentia when faculty and/or administration time is consumed in manuscript review, communication, and other forms of assistance.

Time Limitations

Graduate credit for any coursework that is more than seven (7) calendar years old at the time of the final examination cannot be used to satisfy a master's degree program. The analogous time limitation for a doctoral degree is 10 years. Following the final examination, the candidate has one (1) year during which to provide the Graduate School a disquisition for which the graduate dean will sign final approval of all requirements for the degree. Should the disquisition not be deposited as specified or any other degree requirements not be completed within this time limit, the student must repeat the final examination.

Continuous Enrollment

Students are required to register for at least one credit each semester (fall and spring) required until all degree requirements are completed, including submitting final copies of a thesis, paper, or dissertation. The graduate dean will not approve the degree until the student has registered for the number of credits of research for any semesters not covered by either registration or leave of absence, but not more than four (4) credits total.

A student who has not registered for longer than a continuous two-year period must also reapply for admission and is subject to the degree requirements at the time of readmission.

Leave of Absence

Students who interrupt their graduate program prior to the completion of all degree requirements must maintain continuous enrollment for the Fall and/or Spring Semesters of the absence or obtain a leave of absence, using the Request for Leave of Absence from Graduate Studies form.

NOTE: Leaves of absence do not amend in any way the seven and ten-year time limitations.

Admission Policies

Admission Requirements

Admission to the Graduate School is open to qualified graduates of universities and colleges of recognized standing without regard to race, color, national origin, religion, sex, gender identity, disability, age, status as a U.S. veteran, sexual orientation, marital status, or public assistance 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 (GPA) of at least 3.0, or equivalent, to attain full standing in a graduate degree program. Applicants whose last degree completed is a graduate degree may be admitted in full standing if the final GPA of that degree is at least 3.0 or equivalent.
4. Each program may set higher qualifications and may require the submission of additional evidence of academic performance.

A student shall be permitted to register for graduate study only after formal admission. Programs make recommendations on all applications, but the final admission decision is the responsibility of the Dean of the Graduate School.

Application Requirements

All application materials are due one month before registration for U.S. applicants; some programs have earlier deadlines. (See program sections within the Graduate Bulletin for details.) For international students, the completed application packet and required test scores must be received by the Graduate School prior to May 1 for Fall Semester and prior to August 1 for Spring Semester unless the department has other posted deadlines. There is additional paperwork for international applicants.Click here for graduate application.

Official transcripts (transcripts in a sealed, stamped envelope from the granting institution) of all previous undergraduate and graduate records must be received by the Graduate School before the application is considered complete. When a transcript is submitted in advance of completion of either undergraduate or graduate studies, an updated transcript showing all course credits, grades, and degree completions must be provided prior to initial registration at NDSU.

Letters of recommendation are required before action is taken on any application. Click on Application Materials for the number of letters required by each program. Personal reference report forms are available from the Graduate School website.

Programs requiring or recommending Graduate Record Examination (GRE) or scores Graduate Management Admission Test (GMAT) are indicated on their information pages. Minimum

TOEFL or International English Language Testing System (IELTS) scores by program are also listed on TestScores.

Admission of International Students

North Dakota State University welcomes international students as part of the student body, and the Graduate School encourages applications from qualified students throughout the world. More than 25% of the approximately 2,100 graduate students are international.

In addition to meeting the previously stated admission requirements, to qualify for admission in an advanced degree program, all international students must demonstrate proficiency in English and must provide evidence of adequate financial support for themselves and any dependents for the duration of their graduate program.

International Transfer Students

All international students currently studying in the United States must submit the Supplemental 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 adviser.

International Application Deadline

All application materials for international students must be received by the Graduate School prior to May 1 for Fall Semester and prior to August 1 for Spring Semester. This deadline applies to students matriculating from abroad because of the time required to obtain current financial information, determine student status, and issue the appropriate immigration form.

Language Proficiency for Admission

English proficiency must be demonstrated prior to admission by obtaining a minimum score of 525 (paper-based test) or 71 (internet-based test) on the Test of English as a Foreign Language (TOEFL) or a score of 5.5 on the (IELTS). Some programs require higher scores for admission to their degree programs. The test date must be within two years of the date of the application to the Graduate School. Information about these tests is available on our website.

The TOEFL or IELTS score may be waived for students from countries where English is the official language and for students who have recently earned a degree from a U.S. university or college.

Action on Applications

All applicants who have provided the required application materials, including completed application forms, application fee, reasons for graduate study statement, transcripts, any required educational credentialing, three completed letters of recommendation, and any appropriate test scores, will be notified of action taken on their request for admittance to the Graduate School. Admission of all graduate students requires approval by the Dean of the Graduate School.

Admission Status

Graduate students will be admitted under one of the following classifications:

Full Graduate Standing

These students have met all requirements for admission and have been accepted by a program leading to a graduate degree. A student must have full graduate standing to receive a graduate degree.

Conditional Standing

Students in conditional standing do not meet all requirements for admission or have deficiencies in prerequisite course work but show potential for successful graduate study. Evidence must be provided showing that the applicant's potential is not adequately reflected by his or her record. In making this recommendation, the program must specify standards of performance that must be satisfied for a change in status to full graduate standing. Any students admitted in conditional status because of grade deficiency is automatically placed on academic warning. If a student on academic warning fails to achieve a cumulative GPA of at least 3.0 in the subsequent semester of attendance, the student will be placed on academic probation. The student may not earn more than 12 semester hours of graduate credit while in conditional status.

Students admitted under conditional status may, in consultation with their major adviser, request a change to full graduate standing after demonstration of specified capability in graduate studies using the Change of Admission Status form. This request containing the academic justification for the change is to be made to the Dean of the Graduate School by the major adviser and approved by the program administrator. Eligibility for graduate assistantships will be determined by the program. Students with conditional status cannot become candidates for a degree; they must achieve full graduate standing.

Non-Degree Enrollment

Individuals who hold a baccalaureate degree from an institution of recognized standing may enroll as non-degree students. This category is for individuals who desire to pursue study beyond the baccalaureate degree for personal growth and improvement of skills but not in order to work toward an advanced degree objective. To become a non-degree student, individuals must complete an application form and submit the appropriate fees. Students must have the prerequisite courses or background/experience necessary for the course or courses in which they desire to enroll. This may require consultation and approval from course instructors. In courses with limited enrollment, preference will be given to degree-seeking students.

Students enrolled with non-degree status are not eligible for graduate assistantships, tuition waivers, or federal title IV student financial assistance. Students in this category are affiliated with the Graduate School and not an academic program. No more than 10 credits taken under the non-degree status with a grade of B or higher can be transferred to any official program of study should there be, at any future date, a decision to seek degree classification. Professional development graduate courses (numbered 600) are not eligible for graduate degree programs and may be taken without formal admission to NDSU.

Change in Classification

Students enrolled with non-degree status may subsequently desire to be considered for admission to the Graduate School to pursue an advanced degree. Such a change in status may be accomplished for a subsequent term by submitting a complete application to the Graduate School as a degree-seeking student. The student must be acceptable to a specific program. Appropriate course credits (no more than 10) earned in the non-degree status may be used to fulfill graduate degree requirements if approved by the student's program committee and the Dean of the Graduate School. No course taken in the non-degree status for which the grade is less than B will be permitted on a plan of study for a graduate degree.

Language Proficiency for Teaching Assistants

There will be two recognized categories of teaching assistants:

- Graders are individuals who will have no direct contact with students in their role as a Graduate Teaching Assistant. These individuals must have a minimum TOEFL ibT score of 79 (IELTS of 6.5) and must score at or above the 40th percentile on the TOEFL ibT Speaking and Writing subscales (currently 19 and 21 respectively). The IELTS equivalent scores are 5.0 and 5.5 respectively. Individuals may serve in this capacity for no more than 1 calendar year. To continue as a GTA, students must meet the criteria presented in the following paragraph.
- All other GTAs must have a minimum TOEFL ibT score of 81 (IELTS of 7), a TOEFL ibT Speaking subscale score of 23 or above and a TOEFL ibT Writing subscale score of 21 or above. The IELTS equivalent scores are 5.5 and 5.5 respectively.

Domestic GTAs and international GTAs possessing a US bachelor's degree or higher are not required to present a TOEFL score, provided that the degree included a minimum of two years in residence.

Financial Requirements

Certification of adequate financial support is required from all international applicants other than permanent residents of the United States, parolees, refugees, United States trust territory applicants, or immigrants. Admission will not be granted until proof of funds for the duration of graduate study has been submitted. A North Dakota State University 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, fees, and costs for living expenses for their entire stay at the university.

North Dakota State University does not provide financial assistance for graduate international students who have not been granted an assistantship. A detailed summary of expenses may be found at http://www.ndsu.edu/international/graduate/graduate_expenses/. Each applicant should become familiar with his/her financial needs based on that summary.

Transfer of Funds

There are often difficulties in transferring funds from foreign countries to the United States. Before departing for the United States, students should become thoroughly familiar with their home government's regulations for exchanging and forwarding money.

Sponsored International Students

Agencies and foreign governments that require special administrative and management services from the Office of International Programs at NDSU are assessed an administrative fee. Contact the Office of International Programs for fee amounts.

Medical Insurance

International students are required by the North Dakota State Board of Higher Education to purchase the Board approved health insurance policy before they are allowed to register. 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. Because of the increasing costs of health care in the United States, health insurance for a student's spouse and accompanying dependents is highly recommended and is included in the estimate of expenses for accompanying dependents. In addition, the state of North Dakota requires documentation of immunity to measles, mumps, and rubella prior to registration for courses.

Registration Procedure

In the letter notifying an applicant of admission, the Graduate School will identify an individual, usually the program administrator, whom the applicant should contact. The student should confer with this, or another, program representative prior to initial registration.

Graduate Assistantship Policy

Introduction

Graduate assistants are typically full-time graduate students who participate in teaching, research, or administrative activities in exchange for financial support at North Dakota State University . Graduate assistantships and fellowships are awarded to graduate students who, based on their credentials, are deemed likely to be highly successful as students. Graduate assistantships contribute to student professional development with the primary purpose of assisting students in the successful completion of their academic program. Activities that are relevant to each student's program of study and contribute to the university's teaching, research/creative activity, or service efforts should be incorporated. Each assistantship requires periodic oral and written assessment and feedback regarding a student's performance. Students receiving a graduate assistantship or fellowship are expected to maintain good academic standing and satisfactory progress toward their degrees. Please refer to the section on Graduate School Policies for more information.

Eligibility for Assistantships

Each graduate program must develop a procedure for the awarding of graduate assistantships. Recommendations for assistantships are made to the graduate dean and are subject to the dean's approval. Graduate programs may have specific requirements for eligibility and need to develop a procedure to periodically assess the performance of graduate assistants. Graduate assistantships may also be awarded outside of the student's home program. These assistantships require the continued approval of the graduate program administrator and the graduate dean.

Before any assistantship can be awarded, students must be admitted to the Graduate School as a degree-seeking student. Students placed on Academic Warning may retain their assistantship. Students placed on Probation may no longer receive an assistantship. The tuition discount may be reduced by other financial awards directed specifically to pay tuition.

Teaching assistants whose native language is not English need to demonstrate English proficiency (refer to section titled "English Language Proficiency for Teaching Assistants").

Assistantship Expectations

Students must be registered for credit each semester they receive an assistantship. Students must dedicate the required number of hours to assigned work each week. In addition, international students must maintain the appropriate residency status.

Assistantship appointments may vary in length and are contingent upon the availability of funding. Some assistantships are granted for one academic term or year with reappointment dependent upon performance review. Other assistantships are for multiple years with annual performance reviews. A general guideline for maximum time allowed is two to three years for a master's student and four to five years for doctoral students. Additional time may be approved, on a case-by-case basis, if the work being accomplished by the student warrants such action.

Stipend Levels

Graduate assistantship stipends vary by discipline. A full-time assistantship consists of 20 hours/week. For information on the current minimum stipend level for a full assistantship, refer to graduate student handbooks for the specific department and/or departmental web site information. Departments may award stipends of less than the full-time amount, but they must reduce the workload accordingly.

The responsibilities associated with a graduate assistantship may be variable in nature. The hour commitment defined by an assistantship may be averaged across a given time period. For example, a teaching assistantship of 20 hours/week should total to 320 hours across the 16 weeks of the academic term. In these cases, students should be given adequate advance notice of these variable expectations so that they can adjust their schedules to meet the requirements of the assistantship. Supervisors must also remain sensitive to the academic demands faced by graduate students.

Students receiving graduate assistantships also receive tuition waivers. To be eligible for a tuition waiver, the assistantship must be at least 160 hours per semester and must pay at least the federal minimum wage. Partial tuition waivers are not given when a graduate assistant works less than 160 hours in the semester. The tuition waiver may have limitations depending on the assistantship appointment.

Additional Employment at NDSU

Graduate assistants on full assistantships are not allowed to work on a second assistantship, as part-time instructors, as student workers, or in any other capacity for NDSU while working as a graduate assistant unless an exception is approved by the graduate dean *prior to the work being performed* .

Exceptions may be granted for a few hours of extra work for a specific job (for example, administering an occasional exam, teaching an occasional music lesson, or working at a special event held on a weekend), but not for regular additional hours. Additional work performed during the Winter or Spring breaks is allowed. Additional hours may also be appropriate during the Summer term, depending upon the student's credit load for the Summer term. Exceptions must be recommended in writing by the student's supervisor; approved by the student's advisor; and the student's department or program administrator and forwarded to the Graduate School . The Graduate School notifies Payroll that an exception has been granted. These steps must be completed in the order described and before the student begins work.

Rights and Privileges of Graduate Assistants

Graduate assistants have certain rights and privileges specific to the assistantship experience:

- The right to be notified in writing of all decisions that affect their status as a graduate assistant. This includes advance notification of evaluation procedures and a summary of their performance evaluation.
- The right to be notified of any complaints received by a supervisor or department chair concerning their performance of duties.
- The right to respond in writing to such complaints.
- The right, depending on the availability of departmental and university resources, to be supported in pursuing additional activities that pertain to their professional development.
- The right to balance their assistantship responsibilities with their responsibilities to their academic program so that they can complete their degree in a timely manner.
- The privilege of being treated as a professional in their chosen field of study.

Termination

Graduate assistants may have their assistantship terminated by the graduate dean, upon recommendation by their supervisor, with probable cause. Early termination for cause may occur when

- A student does not abide by the appointment conditions.

- A student fails to perform tasks as assigned.
- A student does not make adequate degree progress.
- A student is placed on Academic Probation.
- A student does not make satisfactory research progress.
- A student fails to maintain minimum registration.
- A student persistently refuses to follow reasonable advice and counsel of faculty in carrying out assistantship obligations.
- A student fails to comply with responsibilities as an employee set forth in the *Graduate Bulletin* , department rules and regulations governing assistantships, or the terms of sponsored research agreements that fund the assistantship.
- A student's personal conduct is seriously prejudicial to the university, including violation of the NDSU Code of Student Behavior, state or federal law, and general university regulations.

Appeals Process

The North Dakota State University philosophy is to encourage and seek resolution of problems at the level most closely related to the origin of the specific disputes. This means

- The first step should be an informal conference to first discuss and attempt to resolve the problem(s) with the person(s) directly involved.
- When a mutually satisfactory resolution cannot be reached or if discussion of the problem(s) seems inappropriate because of the nature of the student's complaint, the student should seek advice from the chair of the department.
- Depending on the nature of the problem(s), the department chair or student's graduate committee chair may deal with the situation directly, advise the student to discuss the problem(s) with the appropriate academic dean and/or the graduate dean, or advise the student of the appropriate grievance procedure to pursue.
- If the graduate assistant wishes to challenge the termination decision, a written appeal to the dean of the Graduate School must be made within two weeks of notification of the mediation results (refer to section titled "Graduate Student Appeals").
- Students should not carry more than a full-time load. Individual departments will determine a minimum and a maximum number of credit hours.

English Language Proficiency Procedure for Graduate Teaching Assistants

1. All students awarded a Graduate Teaching Assistantship (GTA) involving any type of teaching responsibility, including lectures, labs, or tutoring shall be evaluated with respect to overall communication proficiency during the 3rd week of the first semester of his or her teaching duties. While the format may be determined by individual units, the evaluation must be documented and it must address the comprehensive English proficiency of the teaching assistant, including speaking and listening ability, commensurate with his or her assigned duties. A copy of the evaluation instrument and the results for each teaching assistant shall be made available to the Graduate Dean upon request. In addition to the above evaluation, the following requirements must be met:
2. Domestic GTAs and international GTAs possessing a US bachelor's degree or higher are not required to present a TOEFL score, provided that the degree included a minimum of two years in residence. In all other cases, the requirements in #3 below apply.
3. International GTAs whose first language is not English and who do not meet the criteria in #2 above must meet minimal requirements on measures of general English language proficiency, spoken English language proficiency, and written English language proficiency. At the present time, the accepted measure of language proficiency will be the TOEFL ibT or IELTS.

There will be two recognized categories:
Graders are individuals who will have no direct contact with students in their role as a Graduate Teaching Assistant. These individuals must have a minimum TOEFL ibT score of 79 (IELTS of 6.5) and must score at or above the 40th percentile on the TOEFL ibT Speaking and Writing subscales (currently 19 and 21 respectively). The IELTS equivilant scores are 5.0 and 5.5 respectively. Individuals may serve in this capacity for no more than 1 calendar year. To continue as a GTA, students must meet the criteria presented in the following paragraph.

All other GTAs must have a minimum TOEFL ibT score of 81 (IELTS of 7), a TOEFL ibT Speaking subscale score of 23 or above and a TOEFL ibT Writing subscale score of 21 or above. The IELTS equivilant scores are 5.5 and 5.5 respectively.

	Grader		**Teaching Assistant**
Total Score			
ibT	79		81
IELTS	6.5		7
Speaking			
ibT	19		23
IELTS	5.0		5.5
Writing			
ibT	21		21
IELTS	5.5		5.5
Test of Spoken English	42		47

Master’s Degree Policies

Supervisory Committee

The supervisory committee should be formed during the term immediately after the major adviser is identified for the student, and members should be identified before the plan of study is formulated so all committee members have a chance to contribute to the Plan of Study.
The supervisory committee will have at least four members.

The members consist of

1. The major adviser, who must be a full or associate member of the graduate faculty. The student selects the adviser with approval of the program administrator and the Dean of the Graduate School. The major adviser-student relationship must be a mutually acceptable one. The major adviser will act as the chair of the student's supervisory committee and will be in charge of the Plan of Study. The remaining members of the committee must be agreed upon by the student, the major adviser, and the Dean of the Graduate School.
2. A second member, who must be a full or associate member of the graduate faculty.
3. A third member, who could be either a faculty member or a qualified off-campus expert in the field. If this committee member is not a full or associate member of the graduate faculty, the approval of the Dean of the Graduate School is required. Approval by the dean requires a recommendation from the program administrator accompanied by rationale and a curriculum vitae.
4. The Graduate School appointee, who must be a full member of the NDSU graduate faculty from outside the student's program. This appointment is made by the graduate dean, but suggestions as to whom the appointee might be are welcome.

   The role of the Graduate School appointee is to ensure that the student's Plan of Study follows Graduate School guidelines and that other Graduate School policies are observed. The Graduate School appointee also ensures that the expectations for the student's performance are reasonable and that interactions with the supervisory committee are conducted on a professional basis.

NOTE: Other qualified individuals may participate as committee members following approval by the Graduate Dean upon a recommendation accompanied by rationale and curriculum vitae by

the appropriate program administrator and academic dean.

The supervisory committee agreed upon by the major adviser and student, and approved by the program administrator and the academic dean shall be recommended to the Dean of the Graduate School for final approval.

Plan of Study

The Plan of Study shall be appropriate to meet the interests and needs of the student in his or her chosen field as determined by the supervisory committee and approved by the program administrator and the Dean of the Graduate School. The Plan of Study should be submitted to the Graduate School for approval not later than the term immediately after the supervisory committee is formed and must be filed in the Graduate School prior to scheduling the final examination. Revisions may be made later as advisable and necessary, but must be approved by the student, all supervisory committee members, the administrator of the student's program, and the graduate dean. The graduate dean will officially notify the student, supervisory committee and program administrator of all changes.

The Plan of Study shall include the specific courses the student is expected to complete and any other special requirements of the particular master's degree that the student is seeking. The total credits will be determined by each program but must not be less than 30 graduate credits.

For the Thesis Option, of the required minimum 30 graduate credits, at least 16 credits must be approved for graduate credit numbered from 601-689, 691, 700-789, and 791 while the research credits (798) must be not fewer than 6 nor more than 10 credits. Once these minimum requirements have been met, any other graduate courses can be used to satisfy the remaining Plan of Study requirements.

For the Comprehensive Study Option, of the required minimum 30 graduate credits, at least 21 credits must be completed using courses approved for graduate credit numbered from 601-689, 691, 700-789, and 791 while the research credits (797) must be not fewer than 2 nor more than 4 credits.

The various programs determine which approved graduate courses may be used. For specific requirements, the student should consult the specific programs.

Transfer of Credit

All graduate credits used to meet the requirements of a master's degree must be approved by the supervisory committee, the program administrator, the academic dean, and the Dean of the Graduate School. A candidate for the master's degree must petition in order to transfer up to a maximum of 9 semester hours of graduate credit from another institution to satisfy course requirements on the plan of study. A student may used up to 9 credits taken as a non-degree NDSU graduate student towards the degree.

Courses listed in the Graduate Bulletin of the Tri-College University Educational Leadership Program are not considered transfer credits and can be included on programs of study without petition. All other Minnesota State University Moorhead graduate credits are subject to the minimums of transfer credits and to the policies given in the text.

Transfer credits

1. must have been earned from a U.S. or Canadian institution accredited to offer graduate courses and degrees (Credits from international institutions can be transferred only if approved by a committee from the student's program)
2. must carry only grades of A or B on a 4.0 scale
3. must have been earned within a 7-year period at the time of the final examination
4. must be graduate level
5. must not be a continuing education, correspondence, extension, or workshop course
6. must not be internship, individual study, special problem, or research (disquisition) courses, or courses graded Pass/Fail or Satisfactory/Unsatisfactory
7. must not have been used to fulfill the requirements of a baccalaureate degree
8. must be verified by an official transcript
9. will not be used in calculation of the grade point average. It is the responsibility of the student to provide official transcripts of graduate courses taken elsewhere to the Graduate School.

   NOTE: The Special Problem credits of item (6) above are equivalent to North Dakota State University's 696/796 Special Topic credits.

Time Limitation

Graduate credit for any course work which is more than seven (7) calendar years old at the time of the final examination cannot be used to satisfy degree requirements. The final examination must be retaken if the final five (5) copies of the approved disquisition are not delivered to the Graduate School within one (1) year of the date of the final examination or if any other degree requirements have not been completed within one (1) year of the date of the final examination.

If a period of time two years or greater lapses before the final copies are submitted, the student must reapply to the Graduate School, redefend the thesis and must register for a minimum of two (2) credits. Degree date is based on the date when **final** copies are submitted to the Graduate School.

Language Requirements

Each graduate program 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, which will certify the proficiency in the specified foreign language by signing the program of study in the appropriate place. International students whose native language is not English may satisfy the language requirement in their native language, providing their graduate program approves. In these cases, the basis for proficiency will be the candidate's use of English, rather than the foreign language.

Final Examination

The candidate shall pass a final examination (either oral or written as specified for the degree) before being awarded the master's degree. The supervisory committee shall serve as the examining committee of which the major adviser shall serve as chair. Substitutions must be approved by the Dean of the Graduate School.

The final examination shall cover the course work taken by the candidate and also the

disquisition, seminar papers, or oral examination paper and knowledge fundamental thereto. The candidate shall prepare for each member of the committee a written statement describing the Plan of Study, i.e., a list of courses, instructors, credits, grades, and dates taken. Permission to schedule the examination must be requested of the Graduate School by the student's major adviser using the Request to Schedule Examination form. The request to schedule must be received by the Graduate School at least two (2) weeks prior to the examination. The notification by the Graduate School will confirm this scheduled examination.

The disquisition in a near final form must be given to the committee members no fewer than seven (7) days prior to the examination. If this seven (7)-day stipulation cannot be met, the student must either secure the concurrence of all committee members or reschedule the examination. At the conclusion of the examination, the examining committee shall record, in writing, approval or disapproval. The Report of Final Exam must be filed with the Graduate School within seven (7) days of the exam.

A negative vote by more than one member of the student's committee will signify failure of the final examination. The student may repeat the examination only upon permission from a majority of the supervisory committee. The committee will set a date at least one month after the failed examination. Exceptions to this time limit will be considered by the graduate dean upon presentation of written justification from the chair of the committee in consultation with the committee.

Should the examination be failed twice, the student will not be given a third examination except by recommendation of the examining committee, program administrator, and special approval of the Dean of the Graduate School following consultation with the Graduate Council. Continuous enrollment is required until all degree requirements are completed, including submitting final copies of a thesis, paper, or dissertation.

To participate in commencement, the student must have passed the final examination seven days prior to the commencement ceremony.

Degree Requirements

Master of Architecture (M.Arch.)

The Master of Architecture degree is a non-disquisition, professional degree program structure to serve qualified students who hold a 4-year pre-professional degree in architectural studies. Priority is given to students currently enrolled in North Dakota State University's 4-year Bachelor of Science in Environmental Design program. Additional students can be admitted subject to available space. For admission information, contact the Department of Architecture and Landscapes Architecture at (701) 231-8614.

Master of Arts Requirements (M.A.)

The Master of Arts degree is offered in two options: The Thesis Option or the Comprehensive Study Option. Candidates for the Master of Arts degree will meet the above general requirements and those specific requirements in the humanities or social and behavioral sciences. These normally include 2 years of a foreign language. This requirement can be satisfied with undergraduate courses and/or a proficiency examination. The Department of Modern Languages will certify proficiency in the specified foreign language by signing the program of study in the appropriate place.

Master of Business Administration (M.B.A.)

The Master of Business Administration degree is a non-disquisition, professional degree program structured to serve qualified students with any undergraduate degree. The program has two general parts: a foundation course requirement involving up to 30 semester credits and an MBA (common body of knowledge) graduate course requirement of 30 semester credit hours. Depending upon the student's prior course work, all or part of the foundation requirement may be waived. For more details, see the section on Business Administration in this bulletin.

Master of Education (M.Ed.)

The Master of Education degree is a non-disquisition, practitioner-oriented degree for teachers and school counselors. Candidates for this degree will meet these general requirements as well as specific requirements established by the School of Education.

Master of Managerial Logistics (M.M.L.)

The Master of Managerial Logistics is a 36 graduate credit professional degree program

targeted specifically at career military officers, Department of Defense civilians, and other logistic professionals.

Master of Science Requirements (M.S.)

North Dakota State University offers master's degrees in three broad categories. Plan A master's includes completion of a thesis including an oral defense. Plan B master's includes an individual creative component other than a thesis and includes an oral defense. Plan C master's includes coursework accompanied by a well-defined culminating experience.

A program need not offer all three types of master's degrees. The types of degrees offered should be justified based on relevant criteria such as pedagogy or principles appropriate to the field. Programs wishing to grant a Master of Science degree or a Master of Arts degree typically need to satisfy the requirements of either the Plan A or the Plan B options. The Plan C option is primarily intended for professional degree programs. In addition, the three plans differ in the composition of the student's supervisory committee and required submissions to the Graduate School upon degree completion.

The Plan A option requires the completion of a thesis. The thesis would typically include a problem statement, a review of existing literature relevant to that problem, and the creation and presentation of new knowledge in providing a solution to the problem. Each student would assemble a supervisory committee as described in the graduate bulletin section titled General Requirements for a Master's Degree. Each candidate is required to pass a final oral examination in which the supervisory committee serves as the examining committee. Following a successful defense, the candidate will submit copies of their thesis to the Graduate School as described in the graduate bulletin.

The Plan B option generally requires a student to develop a thorough understanding of existing knowledge and the ability to apply that existing knowledge to a problem of interest. Under this option, the student would generate an individual creative component which reflects a solution to the problem. Note that under this option, the new knowledge being created is limited, and this is the primary difference between the Plan A and Plan B options. The new knowledge created under the Plan B option need not meet the standard set forth under the Plan A option. The precise nature of the individual creative component is defined by the program with approval by the graduate school. Examples of possible creative components include a comprehensive

paper, a portfolio, or an integrated field experience. As under the Plan A option, each candidate would assemble a supervisory committee and pass a final oral examination. Following a successful defense, the candidate will compose an executive summary or assemble other appropriate documentation as defined by the program to be submitted to the graduate school. This submission to the Graduate School is to be approved by the student's supervisory committee.

The Plan C option is designed for degree programs in which a well-defined culminating experience is more important than is an individual creative component. This option will most frequently be available in professional degree programs. If a Plan C option is available the program must provide to the Graduate School a rationale for the use of the culminating experience and a plan for implementation. Under this option, each program will define a culminating experience such as a capstone course, a written examination, or some other approach to measure the candidate's understanding of the relevant material in the area. The student's supervisory committee would generally consist of faculty solely from within that discipline. The supervisory committee may specify that a certain level of performance (i.e., a minimum GPA) be obtained in specified courses or in the program itself. Upon completion of the appropriate coursework and culminating experience, the candidate will be considered to have completed their masters and their name will be forwarded by the program to the Graduate School. Plan C programs do not require the candidate to submit any other documentation to the Graduate School.

Education Specialist (Ed.S.) in Educational Administration

In addition to offering several Master of Education (M.Ed.) programs preparing candidates for administration credentials in North Dakota, the Educational Leadership program is an integral part of the Tri-College University (a consortium of North Dakota State University, Minnesota State University Moorhead, and Concordia College) which prepares students for Master of Science (M.S.) and Education Specialist (Ed.S.) degrees in Educational Administration. Programs meet certification requirements in the various areas appropriate to elementary and secondary administration. Information can be secured from the Tri-College University Office or the NDSU Graduate School.

Multiple Graduate Degrees

On occasion, a student may be allowed to work at satisfying the requirements of two graduate degrees concurrently. In completing all program and Graduate School requirements for two degrees, a maximum of nine (9) graduate credits of course work can be applied to both programs of study as approved by all members of both supervisory committees, the two program administrators, the academic dean(s), and the Dean of the Graduate School. A student pursuing multiple graduate degrees must maintain continuous enrollment in each program. The disquisitions must differ substantially and must result from substantial work completed independently in each discipline. There are two final examinations. The appropriate time limitation applies to all course work.

Master's Degree with Two Major Areas

Under special circumstances, a student may pursue one master's degree with two major areas. Such a program must have the concurrent recommendation of the administrators of the two programs. The plan of study shall clearly delineate the course work required for each major area. A minimum of 40 credit hours is required, including at least 14 graduate course credits in each of the two major areas. No more than 10 of the required 40 credits shall be research credits under the Thesis Option while no more than 3 of the required 40 credits shall be paper credits under the Comprehensive Study Option. The student is required to conduct interdisciplinary scholarly work culminating in a disquisition acceptable in both major areas.

Thesis Option

Under the guidance of the major adviser, each candidate shall prepare a thesis approved by the administrator of the major program and acceptable to the oral examination committee and to the Dean of the Graduate School. Of the 30 graduate credits required, a minimum of 16 credits must be in courses approved for graduate credit numbered 601-689, 691, 700-789, and 791 (referred to as didactic courses); thesis credits must not be fewer than 6 nor more than 10 credits. The thesis bearing the approval of the major adviser shall be in the hands of the examining committee at least seven (7) days before the final oral examination. The candidate shall consult the major adviser regarding the form in which the thesis is to be presented. General instructions on the thesis format are included in the North Dakota State University Graduate School's Guidelines for the Preparation of Dissertations, Theses, and Papers. The thesis is the basis for opening the oral examination.

Comprehensive Study Option

This option is offered in certain fields where the candidate may benefit more from a broader range of knowledge than from the preparation of a thesis. Of the 30 graduate credits required, a minimum of 21 credits must be in courses approved for graduate credit numbered 601-689, 691, 700-789, and 791 (referred to as didactic courses). The research credits(797) must not be fewer than 2 nor more than 4.

The creative component(paper, portfolio, etc.) bearing the approval of the major adviser shall be in the hands of the examining committee at least 7 days before the final oral examination. The creative component must demonstrate ability to do scholarly study appropriate to the major field and present evidence of appropriate written expression. The creative component is the basis for opening the oral examination. General instructions on the format for papers are included in the North Dakota State University Graduate School's Guidelines for the Preparation of Dissertations, Theses, and Papers.

IRB, IBC, and/or IACUC Approval

If a proposed graduate research project involves human, animal, or biohazard subjects, it must be submitted for review and approval by the Institutional Review Board (IRB), the Institutional Animal Care and Use Committee (IACUC), and/or the Institutional Biosafety Committee (IBC). This process should be initiated by the student after his or her supervisory committee has approved the final research design because IRB, IBC, and/or IACUC approval must be obtained **before** the research project commences and cannot be granted retroactively. Please include a copy of the appropriate approval letters when the dissertation is submitted for editing.

Disquisitions which involve research using human or animals as subjects or biohazard materials will not be approved by the Graduate School if such research has not been previously approved by the Institutional Review Board (IRB), Institutional Animal Care and Use Committee (IACUC), or Institutional Biosafety Committee (IBC) as appropriate. Every effort should be made by advisers to see that students are aware of these University requirements.

Filing the Thesis or Paper

After the final examination, the student incorporates into the thesis or paper corrections suggested at the oral examination. The student, major adviser, and program administrator then sign the Checklist for Dissertations, Theses, and Papers; and one copy of the thesis or paper,

printed on regular paper, is presented to the Graduate School for approval. This copy must be accompanied by a receipt from the Customer Account Services for the completion package. After approval, 5 final copies of the thesis or paper, on the required paper are to be presented, unbound, to the Graduate School. Two bound copies of the thesis or paper go to the university library. The remaining 3 bound copies are for the student, the student's adviser, and the student's program.

The student will have 1 year from the date of the final examination to deliver the 5 final copies to the Graduate School and complete all other degree requirements. Should the disquisition not be deposited as specified or any other degree requirements not be completed, the student must retake the final examination. If a period of time two years or greater lapses before the final copies are submitted, the student must reapply to the Graduate School and must register for a minimum of 2 credits. Degree date is based on the date when **final** copies are submitted to the Graduate School.

Doctoral Policies

Doctoral Degrees

Doctor of Musical Arts (D.M.A.)

The D.M.A. is the terminal professional practical degree in music, designed for performers and conductors wishing to acquire the highest performance abilities.

Doctor of Nursing Practice (D.N.P)

The Doctor of Nursing Practice degree is a clinical doctorate offered for post baccalaureate nurses with specialization as a Family Nurse Practitioner. An individually-tailored program of study for the DNP is also available for the certified advanced practice nurse with a master's degree.

Doctor of Education (Ed.D.)

The Doctor of Education (Ed.D.) is available in Institutional Analysis and Occupational and Adult Education. The degree requires extensive field service involving qualitative and/or quantitative research, leading to a dissertation that will apply a theory at an institution.

Doctor of Philosophy (Ph.D.)

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 prescribed examinations, and the development of an acceptable dissertation covering some significant aspect of a major field of learning.

Supervisory Committee

The supervisory committee should be formed during the term immediately after the major adviser is identified for the student, and members should be identified before the plan of study is formulated so all committee members have a chance to contribute to the plan of study.

The supervisory committee will have at least four members. The members consist of

1. The major adviser, who must be a full or associate member of the graduate faculty. The student selects the adviser with approval of the program administrator and the Dean of the

Graduate School. The major adviser-student relationship must be a mutually acceptable one. The major adviser will act as the chair of the student's supervisory committee and will be in charge of the Plan of Study. The remaining members of the committee must be agreed upon by the student, the major adviser, and the Dean of the Graduate School.

2. A second member, who must be a full or associate member of the graduate faculty.
3. A third member, who could be either a faculty member or a qualified off-campus expert in the field. If this committee member is not a full or associate member of the graduate faculty, the approval of the Dean of the Graduate School is required. Approval by the dean requires a recommendation from the program administrator accompanied by rationale and curriculum vitae.
4. The Graduate School appointee, who must be a full member of the NDSU graduate faculty from outside the student's program. This appointment is made by the graduate dean, but suggestions as to whom the appointee might be are welcome.

   The role of the Graduate School appointee is to ensure that the student's Plan of Study follows Graduate School guidelines and Graduate School policies are observed. The Graduate School appointee also ensures that the expectations for the student's performance are reasonable and that interactions with the supervisory committee are conducted on a professional basis.

NOTE: Other qualified individuals may participate as committee members following approval by the Graduate Dean upon a recommendation accompanied by rationale and curriculum vitae by the appropriate program administrator and academic dean.

The supervisory committee agreed upon by the major adviser and student, and approved by the program administrator and the academic dean shall be recommended to the Dean of the Graduate School for final approval.

Each committee member shall have an equal vote in committee decisions. The committee is to assist the student in the preparation of a plan of study and to advise him or her during the period of graduate work. 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.

Plan of Study

The Plan of Study will be prepared by the student and the major adviser. It shall be approved by the supervisory committee, program administrator, academic dean, and Dean of the Graduate School.

The Plan of Study should be submitted to the Graduate School for approval not later than the term immediately after the supervisory committee is formed and must be filed in the Graduate School prior to scheduling the comprehensive/preliminary examination. Revisions in the program of study must be approved by the student, supervisory committee, program administrator, and Dean of the Graduate School. The graduate dean will officially notify the student, supervisory committee, program administrator, and the academic dean of all changes.

Each program has the responsibility of defining the requirements for a major in its disciplinary area. The total credits will be determined by each program but must not be less than 90 semester graduate credits, of which not less than 27 credits must be in courses approved for graduate credit numbered 601-689, 691, 700-789, and 791 (referred to as didactic courses). Of these 27 credits, not fewer than 15 credits must be in 700-level course work (700-789 & 791). A student matriculating with a master's degree, including a degree earned at an international institution, must earn not fewer than 60 graduate credits at NDSU. Of these credits, not fewer than 15 credits must be NDSU courses at the 700 level (700-789 & 791). For specific requirements, the student should consult the specific programs.

Transfer of Credit

All graduate credits used to meet the requirements of a doctoral degree must be approved by the supervisory committee, the program administrator, the academic dean, and the Dean of the Graduate School.

The doctorate requires 27 credits of didactic course work, and of these, no more than 12 may be transferred by the petition process. Course work which is transferred does not reduce the total requirement of 60 credits for students with a master's degree in the same discipline.

Courses listed in the Graduate Bulletin of the Tri-College University Leadership Administration Program are not considered transfer credits and can be included on programs of study without petition. All other Minnesota State University Moorhead graduate credits are subject to the minimums of transfer credits and to the policies given in the text.

All transfer credits

1. must ordinarily have been earned from a U.S. or Canadian institution accredited to offer graduate courses and degrees (Credits from international institutions are transferable only after examination by a committee from the student's program.)
2. must carry only grades of A or B on a 4-point scale
3. must have been earned within a 10-year period at the time of the final examination
4. must be clearly graduate level (a course listed as both graduate and/or undergraduate level will not be transferred)
5. must not be a continuing education, correspondence, extension, or workshop course
6. must not be internship, individual study, special problem, or research (disquisition) courses, or courses graded Pass/Fail or Satisfactory/Unsatisfactory
7. must not have been used to fulfill the requirements of a baccalaureate degree
8. must be verified by an official transcript
9. will not be used in calculation of the grade point average.

It is the responsibility of the student to provide official transcripts of graduate courses taken elsewhere to the Graduate School.

NOTE: The special problem credits in item 6 are equivalent to North Dakota State University 696/796 Special Topic credits.

Time Limitation

Graduate credit for any course work that is more than 10 calendar years old at the time of the final examination cannot be used to satisfy degree requirements. The final examination must be retaken if the final six (6) copies of the approved dissertation are not delivered to the Graduate School within one (1) year of the date of the final examination or if any other degree requirements have not been completed within one (1) year of the date of the final examination. If a period of time two (2) years or greater lapses before the final copies are submitted, the student must reapply to the Graduate School and must register for a minimum of two (2) credits. Degree date is based on the date when **final** copies are submitted to the Graduate School.

Residence Requirements

Graduate study for the Doctor of Philosophy degree normally requires a minimum of 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.

Language Requirements

Each graduate program 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, which will certify the proficiency in the specified foreign language by signing the Ph.D. program of study in the appropriate place. International students whose native language is not English may satisfy the language requirement in their native language, providing their graduate program approves. In these cases, the basis for proficiency will be the candidate's use of English, rather than the foreign language.

Examinations

A comprehensive/preliminary examination will be required of each student after the greater portion of courses has been completed and any required language proficiency has been certified. This examination consists of a written part and an oral part. 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.

The final examination will be taken after the candidate has completed the course work and dissertation. This oral examination will be concerned primarily with the dissertation, but it may also cover material from course work, especially those courses fundamental to the dissertation.

Permission to schedule the comprehensive/preliminary and the final oral examinations must be

requested. Permission to schedule the examination must be requested of the Graduate School by the student's major adviser using the Request to Schedule Examination form. The request to schedule must be received by the Graduate School at least two (2) weeks prior to the examination. The notification by the Graduate School will confirm this scheduled examination.

The examining committee shall consist of the supervisory committee. The dissertation in a near final form must be given to the committee members at least 7 days prior to the final examination.

At the conclusion of each oral examination, the examining committee shall record, in writing, its approval or disapproval of the candidate and file its report with the Dean of the Graduate School. The committee's decision filed on the Report of the Final Examination signifies that the student has been examined with respect to the knowledge required in the major area and that all course work has been satisfactorily completed. This form should be filed in the Graduate School within 7 days.

A negative vote by more than one member of the student's committee will signify failure of either the comprehensive/preliminary examination or the final examination. Upon permission of a majority of the supervisory committee members, a candidate is allowed to take each examination twice. The supervisory committee will set a date at least one month after the failed examination. Exception to this time limit will be considered by the Dean of the Graduate School upon presentation of written justification from the chair of the supervisory committee in consultation with the committee members.

Should both attempts to pass an examination result in failure, the candidate may request to take the examination a third time. A request for a third examination requires the support of the supervisory committee and program administrator, and the approval of the Dean of the Graduate School after consultation with the Graduate Council.

Continuous enrollment is required until all degree requirements are completed, including submitting final copies.

To participate in commencement, the student must have passed the final examination.

IRB, IBC, and/or IACUC Approval

If a proposed graduate research project involves human, animal, or biohazard subjects, it must be submitted for review and approval by the Institutional Review Board (IRB), the Institutional Animal Care and Use Committee (IACUC), and/or the Institutional Biosafety Committee (IBC). This process should be initiated by the student after his or her supervisory committee has approved the final research design because IRB, IBC, and/or IACUC approval must be obtained **before** the research project commences and cannot be granted retroactively. Please include a copy of the appropriate approval letters when the dissertation is submitted for editing.

Disquisitions which involve research using humans or animals as subjects or biohazard materials will not be approved by the Graduate School if such research has not been previously approved by the Institutional Review Board (IRB), Institutional Animal Care and Use Committee (IACUC), or Institutional Biosafety Committee (IBC) as appropriate. Every effort should be made by advisers to see that students are aware of these University requirements.

Dissertation

The dissertation must show originality and demonstrate the student's capacity for independent research. It must embody results of research which constitute a definitive contribution to knowledge.

Filing the Dissertation

After the final examination, the student incorporates into the dissertation corrections suggested at the oral examination. The student, major adviser, and program administrator then sign the Checklist for Dissertations, Theses, and Papers; and one copy of the dissertation, printed on regular paper, is presented to the Graduate School for approval by a disquisition editor and the Dean of the Graduate School. This copy must be accompanied by a receipt from the Customer Account Services for the completion package. After approval, 6 final copies of the dissertation, on the required paper are to be presented, unbound, to the Graduate School. Two bound copies of the thesis or paper go to the university library. Three bound copies are for the student, the student's adviser, and the student's program. The sixth copy of the dissertation, accompanied by an additional copy of the title page and an additional copy of the Abstract signed by the major adviser, is sent to Bell & Howell for microfilming.

The student has 1 year from the date of the final examination to deliver the 6 final copies to the

Graduate School and complete all other degree requirements. Should the disquisition not be deposited as specified or all other degree requirements not be completed, the student must repeat the final examination. If a period of time two years or greater lapses before the final copies are submitted, the student must reapply to the Graduate School and must register for a minimum of 2 credits. Degree date is based on the date when **final** copies are submitted to the Graduate School.

Graduate Certificate Programs

The goal of Graduate Certificate (GC) programs at NDSU is to provide didactic course experiences that form a distinct knowledge or skill set identified as a named certificate. Origination and planning of each GC will occur within Graduate Certificate program committees hosted by an academic program. Interdisciplinary programs are encouraged, and in such cases, primary contributors will be listed as host programs.

Admission

Applicant must

1. Have a baccalaureate degree from an educational institution of recognized standing.
2. Provide official transcripts documenting any and all degrees.
3. Be approved for admission by the program administrator hosting the graduate certificate program and by the Dean of the Graduate School.
4. Have an academic adviser assigned by the program administrator of the respective Graduate Certificate program before being admitted by the Graduate School.
5. If English is not the applicant's first language, have a TOEFL or IELTS score equivalent to that needed for GM or GD programs in the unit or provide sufficient documentation of adequate or better English language proficiency.
6. Admission into a Graduate Certificate program does not guarantee admission into a graduate degree program nor imply the waiver of any requirements for admission into a graduate degree program.

Completion

1. Only grades of C or higher will satisfy requirements for course completion. Cumulative GPA on all credits taken at NDSU since admission as a GC, GM, or GD student must be 3.0 or better.
2. Candidates apply for certificate issuance using a form provided by the Graduate School.
3. The Dean of the Graduate School, using official NDSU transcripts, will verify course completion and issue a certificate. Upon issuance of the certificate, the dean will notify the program administrator hosting the GC program.

4. Courses used to satisfy the Graduate Certificate program requirements cannot be older than three years at the time the certificate completion is verified.
5. There might be a public recognition of individuals who complete Graduate Certificate programs.
6. Transcripts will list Graduate Certificate program and the names(s) of the completed certificate program(s).

Administration

The Graduate School will administer GC programs.

1. Each GC program will be determined by a committee. Each committee will be comprised of three to five graduate faculty members. The committee must determine the program outcome(s) and designate the courses that meet that outcome. Graduate Faculty committee members must indicate their approval by signing the final program description. The host program administrator(s) must also sign in approval. Committee chairs must be full members of the NDSU Graduate Faculty and be selected by the committee. The chair will reconvene the committee at least annually, and whenever program changes are appropriate, to review the program.
2. Committees will provide outcome or descriptive information to the Graduate School that will establish and maintain a Web site to advertise and explain NDSU graduate certificate programs to potential candidates. The site will list courses for each certificate, admission requirements, past completers (with permission), etc. The Graduate School must be sure that the site is updated at least annually.
3. Graduate Certificate program candidates who do not have active Graduate Master's (GM) or Graduate Doctorate (GD) classifications will be classified as GC.
4. Since GC is not a degree track, federal Title IV student financial assistance and tuition waivers will not be available for students classified as GC.
5. Students classified as GM or GD may pursue Graduate Certificate programs.
6. Program administrators will monitor and report GC completions in program reviews, annual reports, and other summative documents. Faculty should be given credit for GC participation in merit/tenure considerations.

Approval Process for Graduate Certificate Programs

The approval process will be the same as that of degree programs. The usual supporting documentation is outlined: http://senate.ndsu.edu/acadaffairs/.

Signatures are required from

1. Program administrator(s) of the host academic program(s)
2. College Curriculum Committee
3. Academic Dean
4. Graduate Council and Dean of the Graduate School
5. University Academic Affairs Committee
6. University Senate
7. State Board of Higher Education

Curriculum Development

1. Committees will develop programs with a minimum of 8* credits in specific graduate-level didactic courses which can be completed preferably within one year but no more than three years.
   * Different certificates may have higher credit requirements.
2. No more than 3 transfer credits may be applied towards the certificate. Any transfer credits must be approved by the GC program committee.

Review and Maintenance

1. The Graduate School will ask the University Senate Program Review Committee to include Graduate Certificate programs as a separate section of its review of programs.
2. The Graduate School will request that the Provost and Vice President for Academic Affairs ask the State Board of Higher Education to drop a Graduate Certificate program at any such time as 1) there have been no certificates issued in any three-year period or 2) following the recommendation of a Graduate Certificate committee that its program be dropped.
3. The Graduate School will provide a yearly report on the state of NDSU Graduate Certificate programs to the Graduate Council, the University Senate Academic Affairs Committee, the Provost and Vice President for Academic Affairs, each academic dean, and the Director of Distance and Continuing Education.

4. The Dean of the Graduate School or a designee will interview (in person or by phone) each person completing a Graduate Certificate program.
5. The Dean of the Graduate School or designee will obtain evaluative information about NDSU Graduate Certificate programs from the employers of certificate program completers who give the Dean of the Graduate School permission to obtain such evaluative information and from other sources such as professional associations.

Graduate Student Appeals

The North Dakota State University philosophy is to encourage and seek resolution of problems at the level most closely related to the origin of the specific disputes. This means

1. the student is to first discuss the problem(s) with the person(s) directly involved;
2. if the student is not satisfied after discussing the problem with the person(s) directly involved or if discussion of the problem(s) seems inappropriate because of the nature of the student's complaint, the student should seek advice from the administrator of the program; and
3. depending on the nature of the problem(s), the program administrator or student's supervisory committee chair may deal with the situation directly, advise the student to discuss the problem(s) with the appropriate academic dean and/or the Dean of the Graduate School, or advise the student of the appropriate grievance procedure to pursue. Areas of possible graduate student appeal are equal opportunity, academic evaluation via assignment of course grades, sanctions for academic dishonesty, and degree-acquisition processes that are unique to graduate education. The burden of proof by a preponderance of the evidence is on the graduate student making the appeal.

Equal Opportunity

North Dakota State University's general and specific commitment to being an equal opportunity institution is expressed elsewhere in this bulletin. As stated there, inquiries concerning compliance may be directed to the Vice President of the Division of Equity, Diversity and Global Outreach (202 Old Main, 231-7703) or to the Office for Civil Rights, U.S. Department of Education, 10220 N. Executive Hills Blvd., 8th Floor, 07-6010, Kansas City, MO 64153-1367.

Academic Evaluation

The University Senate Grade Appeals Board has the authority to hear charges of inequitable or biased academic evaluations and to provide redress for any improper evaluations as it may find to have actually taken place. This is for course grades assigned by instructors in charge of the courses. This includes grades of disquisition courses. Both the "Rights & Responsibilities of Community: A Code of Student Behavior," which is available from the Office of Vice President for Student Affairs, and Section 337 of the NDSU Policy Manual, have the procedural details. Salient points repeated here are that the student must initiate a request for a change of grade

with the instructor within 15 instructional days of the first day of the semester immediately following the semester in which the grade was awarded. During an actual appeal, the burden of proof is on the student. The Grade Appeals Board procedures are for student grievances against instructors over course grades assigned.

Academic Dishonesty

Procedures dealing with issues of academic dishonesty in meeting course requirements, such as cheating, plagiarism, or other academic improprieties, brought by instructors against students enrolled in their course(s) or other NDSU course(s) or persons not enrolled at NDSU but viewed by the instructor as involved in the academic dishonesty are detailed in both the "Rights & Responsibilities of Community: A Code of Student Behavior" and Section 335 of the NDSU Policy Manual referenced in the preceding paragraph. A substantial range of penalties to the student(s) is available to the instructor(s) and academic deans of the colleges involved, i.e., the college offering the course(s) and the college of which the student(s) is (are) a member. One option available to the deans is to recommend suspension or expulsion from the university. The decision to impose any penalty or disciplinary sanction for prohibited academic conduct against a graduate student in meeting the requirements of either an undergraduate or graduate course may be appealed by said graduate student to a graduate student appeals committee provided there is documentation, in writing, of consultation with instructor(s), program administrator(s), and dean(s), in sequence, to resolve the conflict. This appeal starts with a written notice to the Dean of the Graduate School. The written notice must be accompanied by the aforementioned documentation and must be received by the Dean of the Graduate School within 6 weeks of the most recent date on the documentation.

There are processes and activities that are intrinsic to the acquisition of a graduate degree. The processes include specification of degree requirements, preliminary and qualifying examinations, disquisition writing and approval, and possible dismissal from the program or the Graduate School. The activities for which faculty have primary responsibility include instructing students enrolled in courses; mentoring students; collecting, analyzing, and presenting for public consumption the sequent results and conclusions; and possibly working with proprietary information. Problems in these areas are to be discussed with the chair of the graduate student supervisory committee and administrator of the program, in that order. Normally, these faculty members will attempt to work out a resolution of any problem by bringing the parties involved together in an informal, nonadversarial manner. Inquiry at this stage is usually limited to a

determination of 1) whether the graduate student has been treated in an arbitrary or capricious manner or in some way not consistent with previously announced policy guidelines or 2) whether the graduate student has acted in a manner inconsistent with formal or traditional standards of academic conduct.

Conflicts not satisfactorily resolved at the program level are to be brought to the academic dean who will discuss the problem(s) with all interested parties. If resolution does not result at the academic dean level, an appeal can be brought to a graduate student appeals committee as long as there is documentation, in writing, that the graduate student has consulted the graduate student's supervisory committee chair, the program administrator, and the academic dean in attempts to resolve the conflict. This appeal starts with a written notice to the Dean of the Graduate School. This written notice must be accompanied by the aforementioned documentation and must be received by the Dean of the Graduate School within 6 weeks of the most recent date on the documentation.

Graduate Student Appeals Committee

The Dean of the Graduate School is responsible for forming a graduate student appeals committees and informing the committee members of their duties. A graduate student appeals committee has 5 members, all of whom must be graduate faculty or currently enrolled graduate students, and will be comprised of the following members:

1. one person not on the Graduate Council appointed by the graduate student initiating the appeal;
2. one person not on the Graduate Council appointed by the party or parties complained against;
3. one person appointed by the Dean of the Graduate School;
4. one graduate student member of the Graduate Council chosen by lot if a graduate student has not been appointed by either contesting party or the Dean of the Graduate School;
5. one current member of the Graduate Council chosen by lot if a graduate student has not been appointed by either contesting party or the Dean of the Graduate School, or two current members of the Graduate Council chosen by lot if a graduate student has been appointed by either contesting party or the Dean of the Graduate School.

The Dean of the Graduate School will serve as an ex-officio and nonvoting member. The administrator(s) and dean(s) of the program(s) and college(s) involved cannot be members of the committee. The 5 appointed committee members elect the chair of the committee from its membership. The graduate student and the party or parties complained against each have the right to challenge, with cause, to the Dean of the Graduate School one membership of the graduate student appeals committee.

The burden of proof shall be with the appealing graduate student. The appealing graduate student has the right to 1) be given due notice in sufficient detail that the accusation is clear and the circumstances of the accusation are detailed enough for meaningful response by the accused and 2) be heard by an impartial body. Each contending party may, if it wishes, be accompanied by one counsel, but any counseling is restricted to 1) what to ask, 2) when not to respond to a question, and 3) how to answer a question. Counsel may not intrude on the hearing. The appeals committee is not bound by rules of legal evidence or procedure and may develop procedures that its members consider to be fair and equitable to the particular circumstance(s). All questioning will be done through the chair of the committee. Committee members can make decisions on available information; nonresponse to questions is available information, i.e., a negative inference can be drawn from the lack of a response. The hearing will be closed unless the student signs a release waiving his or her rights to a closed hearing. The hearing, but not the appeals committee's deliberations, will be tape-recorded.

The decisions and recommendations of the appeals committee shall be by majority vote and will be advisory to the Dean of the Graduate School, who will then be responsible for taking appropriate action(s). Any further appeal shall be directed to the President of the University.

Distance and Continuing Education

The Department of Distance and Continuing Education is an outreach unit at North Dakota State University that makes the resources of the institution available in a variety of traditional and non-traditional ways, including distance-based education. The Department's general mission is to provide opportunities for learning experiences whenever the need for such opportunities has been established by individuals or companies. It provides these opportunities by organizing and coordinating efforts of various university units or contracting agencies. For noncredit activities, Continuing Education also serves as registrar of its efforts and may issue transcripts certifying completion of the activities.

For more information please visit the Distance and Continuing Education page by clicking the link **Distance and Continuing Education**.

Financial Information

Tuition and Fees

Note: Fees and expenses shown here are estimated for the 2010-2011 academic year. All fees are subject to change without notice. Current tuition rates and fees are available on the **BisonConnection** website.

Tuition Rates

Residency	Tuition per credit	12 credits
Resident	$251.98	$3024.00
Minnesota	$305.58	$3667.00
Sask-Manitoba, South Dakota, Montana	$377.97	$4535.50
Non-resident	$672.78	$8073.50

Student Fees

Student fees are a per credit charge up to 12 credits.

Student Fees	Fall 2010/Spring 2011
Activity Fee	$10.90
Union Bond	$3.85
Career Services	$1.08
Technology Fee	$6.88
Health/Wellness Fee	$11.42

Library Fee	$1.66
ND Student Association	$0.03
ConnectND Fee	$6.75
Total per credit	**$42.57**
TOTAL (for 12 or more credits)	**$510.78**

North Dakota Residency Guidelines

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

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 benefited employee of any North Dakota University System institution;
7. a spouse of a resident for tuition purposes.
8. Any other 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.

*The application for resident student status can be found at **www.ndsu.edu/registrar** (click on forms link). The application is due prior to the start of the academic term that the student is applying for resident tuition status.

Minnesota Reciprocity

Minnesota residents should apply for reciprocity at the following Web address: **www.getreadyforcollege.org**

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

Residency issues must be resolved by the last day of classes of the first session 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 year will need to re-file.

Other Fees

A variety of fees are applied to special services. Some of the most common include:

Application fee

Non-refundable application fee-$50

Residence Hall reservation deposit

Deposit is applied toward student's account - $50

Family student apartment deposit

Deposit is applied toward student's account - $200

Parking permits

All NDSU employees and students are assessed fees to park in University lots. For further information, contact the Campus Police (701-231-8998).

Photo ID

Original and replacement of lost cards is $20 per card. All students must have an NDSU photo identification card. Student identification cards may be purchased at the Memorial Union's Bison Card Center. (The student ID card allows use of the library facilities as well as attendance of NDSU athletic events.)

Course or Class Fees

Courses or classes that have additional fees will have the amount listed under ***Class Notes*** in the ***Class Sections Detail*** on **Campus Connection**.

Late payment fee

A late payment fee is added to the outstanding balance when tuition and fees are not paid within the allotted time. $50

Student Health Service fees

Payment of student registration fees entitles a student to the basic services of the Student Health Service. Additional fees are charged for medications, certain studies, and additional services according to rates maintained and available at the clinic.

Distance Education fees

Please contact the Division of Distance and Continuing Education by phone 701-231-7015 or **http://www.ndsu.edu/dce/**.

Course audit

The course audit (not for credit) fee is 50% of the regular tuition charge.

Diploma replacement

The Office of Registration and Records provides a replacement service for those who have lost or damaged their diploma for a fee of $25.

Completion Package

A completion fee of $200 is charged to all master's students who are completing a thesis or paper. The fee covers the costs for

- Completing the format and quality check of the disquisition.
- Binding 5 copies of the thesis or paper.
- Title inscription on the spine of the bound thesis or paper (if possible).
- Shipping up to 2 bound copies of the disquisition.
- Processing of graduation and commencement information.
- Workshops and consultation services for writing the thesis/paper.

A completion fee of $250 is charged to all doctoral students who are completing a dissertation. The fee covers the costs for

- Completing the format and quality check of the disquisition.
- Binding 5 copies of the dissertation.
- Title inscription on the spine of the bound dissertation (if possible).
- Shipping up to bound 2 copies of the disquisition.
- Microfilming the dissertation.
- Processing of graduation and commencement information.
- Workshops and consultation services for writing the dissertation.

Additional bound copies of the disquisition are available at a cost of $20 per copy.

Students who are not required to complete a disquisition will be assessed a $25 graduation processing fee.

Withdrawals

Tuition and fees will be refunded at 100% for students who withdraw on or before the end of the seventh instructional class day of a regular term. Non-regular terms will provide for a proportionate refund schedule based on the length of the term. Students who withdraw after the end of the seventh instructional day or proportionate period of a term will have tuition and fee refunds calculated based upon a declining percentage extending through the 60 percent point of the term. Specific dates and refund percentages are published in the Registration Schedule each term.

Course Drops

Refunds, where applicable, will be made at 100% for course drops during the first seven instructional class days of a regular term.

Non-regular terms will provide for a proportionate refund schedule based on the length of the term. After the seventh day or proportionate period of a term, there are no refunds for students who drop a class or classes and continue to be enrolled.

Medical Insurance for Domestic Students

A student group accident and sickness insurance plan is available to all graduate and undergraduate students of North Dakota University System institutions, including North Dakota State University.

The insurance plan is available to students and their dependents. The coverage is designed to provide benefits for medical expenses arising from an accident or illness including those that occur off campus and during interim vacations. Any questions about the policy should be directed to **Vaaler Insurance, Inc**, (701) 775-3131.

The policy is administered by Student Assurance Services, Inc., P.O. Box 196, Stillwater, MN 55082. Most of the benefit dollar amounts are described as Usual and Customary Charges. The medical benefits are for basic injury and sickness (inpatient, outpatient, and other), benefits mandated by North Dakota law, and accidental death and dismemberment.

Annual premiums are available at **www.sas-mn.com**. Premiums can be paid for just one of the three academic sessions or for the combination of Spring and Summer Sessions.

The detailed information can be obtained from the NDSU Student Health Service, Wellness Center, phone: (701) 231-7331.

Required Medical Insurance for International Students

International students are required by the North Dakota State Board of Higher Education to purchase the Board approved health insurance policy before they are allowed to register. 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. Because of the increasing cost of health

care in the United States, health insurance for a student's spouse and accompanying dependents is highly recommended and is included in the estimate of expenses for accompanying dependents. In addition, the state of North Dakota requires proof of immunity to measles, mumps, and rubella prior to registration for courses.

Federal Financial Aid

Students applying for federal aid must be 1) a citizen or eligible non-citizen of the United States with a valid Social Security number, 2) enrolled in an eligible program as a regular student seeking a degree or certificate, 3) registered for a minimum number of credits during each term aid is received, 4) making satisfactory progress toward the completion of a course of study, and 5) current in repayment of previous federal loans. Students owing a refund on a Pell or Supplemental Educational Opportunity Grant are not eligible for federal student assistance.

Financial Aid for International Students

Many students from other nations inquire about financial aid. Local fellowships or free tuition are not ordinarily available to international students. The University has international students filling some graduate assistantship positions in several departments. Generally, such students have been required to pay their own way for the first year in order that academic capabilities can be established. All international students must demonstrate adequate funding for the duration of the graduate program; an assistantship can be part of this funding. Expenses are approximately $22,284 (U.S.) per year for a single person and approximately $27,654 (U.S.) for a married couple. These two dollar figures do not include transportation to and from the U.S.

International students with outstanding ability are encouraged to apply. If the applicant requires an assistantship, the individual should submit an application for graduate school to the Graduate School and a separate inquiry to the major department. Such appointments usually are made before April 15.

Board of Higher Education Scholarships

The North Dakota State Board of Higher Education Scholarship consists of a waiver of tuition. This award is made to a limited number of high-quality graduate students nominated by faculty advisers and approved by the Graduate Dean. Selection is based upon need, graduate record, residence, and recommendation of the faculty adviser. Awards are generally made only to students who have completed at least 10 graduate credits, are in full-standing status, and have

an approved plan of study. Applications should be submitted by the academic adviser thirty (30) days prior to the beginning of the academic session. Normally, support will be provided for only four semesters (both summer sessions counting as one semester).

Teaching or Research Assistantships

A number of well-qualified graduate students, upon recommendation from the department concerned, are employed either as teaching or research assistants by most academic departments of the university. Inquiries should be directed to the appropriate department chair(s). Tuition is waived for individuals officially appointed as research or teaching assistants who meet all requirements. Student activity fees are not waived.

Regular scholarships for graduate students are limited. Interested graduate students should contact the dean of their college and/or their department chair regarding scholarships available within their discipline.

Student Services

Wallman Wellness Center

Funded by the student health and wellness fee, the Wallman Wellness Center houses five major components: Student Health Service, Fitness Programs, Campus Recreation and Intramural Sports, Wellness Education and Child Care Service. These five components work together to promote and develop healthy lifestyle opportunities for members of the University community. The Wallman Wellness Center contains cardiovascular and strength equipment, two indoor tracks, a climbing pinnacle and wall, basketball/volleyball and racquetball courts, an all-purpose (MAC) gym, spinning and martial arts studios and two group exercise studios. Please call 231-5200 for additional information.

STUDENT HEALTH SERVICE

The Student Health Service, located in the Wellness Center, is a primary healthcare facility that offers integrated professional services to NDSU students. Registered nurses, certified nurse practitioners, physician assistants, and physicians staff the Student Health Service. Medical laboratory and pharmacy services are also available.

The primary health services of the Student Health Service include health promotion and disease prevention, health counseling, care during acute and chronic phases of illness, and referrals to outside providers when appropriate.

Only registered students are eligible to use the Student Health Service. Appointments may be scheduled by calling the Student Health Service reception desk at 231-7331.

Wellness education leaders conduct health education presentations and activities in the wellness education area, residence halls, and various other locations on campus.

FITNESS PROGRAMS

The Wallman Wellness Center has fitness programs and activity areas to meet the strength and conditioning needs of faculty, staff and students. Staff and student fitness specialists are available to conduct orientation classes, specialized training and fitness testing.

CAMPUS RECREATION AND INTRAMURAL SPORTS

The Wallman Wellness Center 's Intramural Sports programs are designed to help students, faculty and staff become more involved in recreational activities regardless of age, gender, disability, skill level or past experience. Campus Recreation provides the space and some of the equipment for participants to set up their own activities.

WELLNESS EDUCATION

The Wellness Education services and programs support all dimensions of wellness, including physical, social, environmental, occupational, intellectual, emotional and spiritual. Services include health education, nutrition counseling and education, massage therapy and wellness resources. Student Wellness Education Leaders promote wellness through peer education by increasing awareness of student health issues and encouraging positive lifestyle choices and decision-making skills.

CHILD CARE SERVICE

The Child Care is a licensed service provided to NDSU students. Parents may drop off children ages 6 weeks to 6 years old for up to four hours while participating in classes or campus activities. Child Care is available primarily by reservation, but limited part-time drop-off care is also available on a first-come, first-served basis. An hourly fee is assessed to patrons of the Child Care Service.

Housing

Apartments for families and single students are located on and near the NDSU campus. Residence halls are planned to provide a comfortable learning environment and are within walking distance to all classes. They offer excellent opportunities to make new friends and become part of a learning community. The university believes the residence hall program is beneficial to a student's academic, social, and personal growth.

Contracts for residence hall accommodations are for the academic year. Requests for release at the end of the semester are reviewed each semester. Procedures are specified in the General Conditions of License Contract for Residence Halls.

For an application or information regarding food and housing facilities, write to the Department of Residence Life, NDSU Dept. 5310, PO Box 6050, Fargo, ND 58108.

Dining Services

The dining facilities for the majority of students residing on campus are connected to adjacent residence halls. Students living near the center of campus will find food facilities easily accessible in the Memorial Union. Students not residing in the residence halls may purchase a meal plan.

Rates have been established for meal service to provide the dinner meal on the Saturday of move-in day for Fall Semester and on the first day of classes Spring Semester. The noon meal will be the last meal served prior to the beginning of all holidays or recess periods. Sack lunches are provided for class conflicts. A validated campus ID card or cash is required upon entering dining areas. Campus ID cards are not transferable between students or friends. Replacement for a lost campus ID card can be obtained at the ID Card Center, Memorial Union, for a charge of $15.00.

NDSU Bookstore

The NDSU Bookstore is located in the Memorial Union on the southeast end of the main floor. The store is the official source of all required course materials and supplies. It also stocks many convenience items, such as health and beauty aids, gifts, souvenirs, and official NDSU Apparel. Computer software and hardware is sold in the store at academic prices for NDSU Students, faculty and staff. An NDSU ID is required to purchase those items.

The NDSU Bookstore is open from 8:00-6:00 Monday through Thursday and Friday from 8:00-5:00; Saturdays from 10-3 while classes are in session. The Herd Shop convenience store is open 7:30-9:00 Monday through Thursday, 7:30-5:00 on Fridays and on Saturdays when class is in session from 10:00-5:00.

If you have any questions concerning the operational policies of the store the NDSU Bookstore Director can be contacted at 231-7763 and her office is located in the main store. The NDSU Bookstore also operates a Pro Shop located in the Wallman Wellness Center and will open a store in the NDSU Downtown campus in Barry Hall for spring 2009.

Graduate Faculty

Full Member of the Graduate Faculty

Full-status members of the Graduate Faculty of North Dakota State University (NDSU) consist of all persons who hold a probationary (tenure-track) or tenured appointment and have been appointed to the rank of Assistant Professor, Associate Professor, or Professor in an academic unit or program area at NDSU.

A full-status member of the Graduate Faculty of NDSU may teach graduate courses, serve as a member of supervisory committees, chair supervisory committees, serve as the Graduate School appointee to supervisory committees, serve as a member of graduate student appeals committees, serve as a member of the Graduate Council, vote at graduate faculty meetings, and serve in any other capacity as required.

Associate Member of the Graduate Faculty

Persons who have been granted a courtesy appointment (adjunct) with NDSU who are full-time employees of either an on-campus unit or a Research and Extension Center will be granted status as an Associate Member of the Graduate Faculty of NDSU. Individuals whose position responsibilities involve primarily scholarly activity may serve as a chair of supervisory committees. All Associate Members of the Graduate Faculty at NDSU may teach graduate courses and serve as members of supervisory committees.

Persons holding a research professorship who have been appointed to the rank of Assistant Professor, Associate Professor, or Professor in an academic unit or program area at NDSU will be granted the status of Associate Member of the Graduate Faculty of NDSU for the term of their appointment to the academic staff. These individuals may serve as chair of supervisory committees. They may also teach graduate courses and serve as members of supervisory committees.

Persons holding a special appointment (non-tenure track) as a Professor of Practice at NDSU who have been appointed to the rank of Assistant Professor, Associate Professor, or Professor in an academic unit or program area at NDSU will be granted the status of Associate Member of the Graduate Faculty of NDSU for the term of their appointment to the academic staff. These individuals may serve as the chair of the supervisory committee in professional and applied

graduate programs (programs not offering the MS, MA, or PhD). They may also teach graduate courses and serve as members of supervisory committees.

Persons who have been granted a courtesy appointment (adjunct) with NDSU who are not fulltime employees and persons holding appointments as members of the graduate faculty at another institution may, upon application by the faculty of an academic unit or program area of NDSU, approval of the Graduate Council, and confirmation by the Dean of the College of Graduate and Interdisciplinary Studies, be granted the status of Associate Member of the Graduate Faculty of NDSU for a period not to exceed six years. These individuals may teach graduate courses and serve as members of supervisory committees.The following information needs to be provided: a letter of endorsement from the program administrator (chair, head, or director), including a rationale for the request and an indication of faculty approval; a current copy of the nominee's curriculum vitae; and any other pertinent documentation.

NOTE: Associate graduate faculty may serve as chair of a graduate committee upon the recommendation by the appropriate department/program chair and approval of the Graduate Council.

Teaching Waivers

Graduate teaching waivers may be granted to individuals who do not meet the requirements for either full or associate graduate faculty status. Teaching waivers only allow students to serve as the instructor of record for 600 & 700 level courses and carry none of the other privileges of graduate faculty status. Waivers may be granted to qualified individuals who are not students in the department for which the waiver is sought.

The burden of proof lies with the applying graduate program to show that the nominee holds qualifications that merit the granting of a graduate teaching waiver. The following information needs to be provided: a letter of endorsement from the program administrator (chair, head, or director), including a rationale for the request and an indication of faculty approval; a current copy of the nominee's curriculum vitae; and any other pertinent documentation.

Graduate teaching waivers are approved by the Graduate Council and the Dean of the Graduate School . Waivers are granted for one academic year and may be renewed twice at the discretion of the Dean of the Graduate School .

List of Graduate Faculty

The Dean of the Graduate School will, in consultation with the Provost and Vice President for Academic Affairs, maintain a list of the members of the Graduate Faculty of NDSU and publish this list in the Graduate Bulletin. Additions and deletions to the list will be published in the minutes of the Graduate Council.

NOTE: Other qualified individuals may participate in certain graduate affairs following approval by the graduate dean upon the recommendation by the appropriate department/program chair and academic dean.

Accountancy

Program and Application Information

Department Chair: Dr. Bud Bowlin

Program Coordinator: Dr. Donna Dietz

Department Location: Barry Hall

E-mail Address: **Donna.Dietz@ndsu.edu**

Telephone Number: (701) 231-8653

Degree(s) Offered: Master of Accountancy

Application Deadline: April 15, but applications are accepted year-round

Test Requirements

GMAT

English Proficiency Requirements

TOEFL iBT 79

IELTS 6

Program Description

The Master of Accountancy (MAcc) program at North Dakota State University is a non-thesis, professional program structured to advance the knowledge of qualified students with an undergraduate accounting degree. Students without an undergraduate accounting degree may be conditionally admitted to the program and will be required to take a core of undergraduate accounting courses in addition to the graduate courses.

The Master of Accountancy (MAcc) program at NDSU is designed to have students complete graduate studies needed to advance their careers whether their career be in public accounting, corporate accounting, or government accounting and prepare them for the Certified Public Accounting (CPA) exam. Our approach to learning combines case study and applied

Graduate Faculty

Karl Altenburg, Ph.D.
North Dakota State University, 1999
Field:
Management Information Systems

Margaret (Peggy) Andersen, Ph.D.
Indiana University,1989
Field:
Accounting

William "Bud" Bowlin, Ph.D.
University of Texas at Austin, 1984
Field:
Accounting

James Clifton, M.Acc.
University of North Dakota, 1988

Donna Dietz, Ph.D.
University of North Dakota, 1989
Field:
Accounting

Thomas D. Dowdell, Ph.D.
Temple University, 2004
Field:
Accounting

Limin Zhang, Ph.D.
University of Arizona, 2005
Field:
Management Information Systems

learning in a collaborative environment. The focus of the program is to develop a student's analytical skills, provide students with in-depth accounting knowledge and skills, prepare students to identify accounting problems, research the problem and possible solutions through using on-line and other databases, and present a recommended action. The learning environment also provides students the opportunity to draw from the experiences of fellow students from diverse backgrounds as well as interact with corporate, public-accounting, government, and not-for-profit accounting discipline leaders.

Through the College of Business, North Dakota State University's MAcc program is fully accredited by **AACSB International**, the premier accrediting agency in business administration and accounting.

Admissions Requirements

NDSU accounting faculty have ample opportunity to assess applicants for the Master of Accountancy program that are currently enrolled in NDSU's undergraduate accounting program or have an accounting degree from NDSU. Consequently, the admission requirements for NDSU accounting majors/graduates will differ from those required for other applicants.

A. **Admission requirements for NDSU accounting majors**

1. The applicant's overall undergraduate GPA should be at least 3.0 on a 4.0 scale.
2. The applicant's GPA for upper-division accounting courses should be at least 3.0 on a 4.0 scale.
3. The applicant does not have to complete the GMAT, if the student meets the minimum GPA requirements (requirements A.1. and A.2.).
4. If the applicant's undergraduate GPA is below the 3.0 standards (requirements A.1. and A.2.), provisional

David Herda, Ph.D.
University of Texas at Arlington, 2010
Field: Accounting

Yongtao (David) Hong, Ph.D.
Drexel University, 2008
Field:
Accounting

Fariz Huseynov, Ph.D
University of Memphis, 2009
Field:
Finance

Bonnie Klamm, Ph.D., CPA
Virginia Commonwealth University-Richmond, 1999
Field:
Accounting Information System

Terry W. Knoepfle, J.D., CPA
University of North Dakota, 1981
Field:
Business Law and Tax Accounting

Herbert Snyder, Ph.D.
Syracuse University, 1994
Field:
Auditing, Forensic Accounting

Ruilin Tian, Ph.D.
Georgia State University, 2008
Field:
Risk Management & Insurance

David Zhang, Ph.D.
Syracuse University, 2001
Field:
Business Administration/Finance

admission to the program may be allowed under the following conditions: the applicant has significant post-graduation work experience OR the applicant takes the Graduate Management Admissions Test (GMAT) with the expectation the applicant earns a score of at least 550.

5. If the above requirements are not met, the applicant may be granted conditional admission.
6. Conditional admission is granted solely at the discretion of the program coordinator and/or Admissions Committee.

B. **Admission Requirements for Students Graduating with Accounting Major from Tri-College Schools and AACSB accredited Schools**

1. The student's overall GPA should be at least 3.0 on a 4.0 scale.
2. The student's GPA for upper-division accounting courses should be at least 3.0 on a 4.0 scale.
3. Applicants do not have to complete the GMAT, if the student meets the minimum GPA requirements (Requirements #1 and #2).
4. If the student's undergraduate GPA is below the 3.0 standards (Requirements #1 and #2), provisional admission to the program may be allowed under the following conditions:
   4.1. The student has significant post-graduation work experience OR
   4.2. The student takes the Graduate Management Admissions Test (GMAT) with an expectation that the student earn a score of at least 550.
5. Students must also submit a letter stating reasons for wanting a Master of Accountancy degree and two letters of recommendation.
6. If the above requirements are not met, the student *may* be granted provisional admission.
7. Provisional admission is granted solely at the discretion of the program director and admissions committee.
8.

C. **Admission Requirements for All Others**

1. The student has an undergraduate degree from a regionally accredited school.
2. The student's overall GPA should be at least 3.0 on a 4.0 scale.
3. The student's GPA for upper-division accounting courses should be at least 3.0 on a 4.0 scale.

4. The student takes the Graduate Management Admissions Test (GMAT) with an expectation that the student earn a score of at least 520.
5. If the student has not completed the following core courses or their equivalent in their undergraduate program, the student may be provisionally admitted to the program.
   5.1. **Core courses**
   5.1.1. ACCT 311 (Intermediate Accounting I)
   5.1.2. ACCT 312 (Intermediate Accounting II)
   5.1.3. ACCT 320 (Cost Accounting)
   5.1.4. ACCT 418 (Tax I)
   5.1.5. ACCT 421 (Audit I)
   5.2. The student will be expected to complete any missing core courses within the first two semesters of the program.
   5.3. Students must meet the minimum GPA standard of 3.0 for all of the core courses for final acceptance into the program.
6. If the student's undergraduate GPA is below the 3.0 standards (Requirements #2 and #3), provisional admission to the program may be allowed under the following conditions:
   6.1. The student has significant post-graduation work experience.
   6.2. The student takes the Graduate Management Admissions Test (GMAT) with an expectation that the student earn a score of at least 550.
7. Students must also submit a letter stating reasons for wanting a Master of Accountancy degree and two letters of recommendation.
8. If the above requirements are not met, the student *may* be granted provisional admission.
9. Provisional admission is granted solely at the discretion of the program director and admissions committee.

D. Conditional status expires and regular admission is granted if the applicant earns a 3.0 GPA or greater on the first nine credit hours of graduate classes he/she takes. See sections A.4., A.5., B.6., and B.7. above.

Financial Assistance

A limited number of graduate assistantships are available through the Master of Accountancy program. The Program Director will send an application for the assistantship to all students who

have applied to the program by April 1. The submission deadline is April 15th. Assistantships will be awarded by May 1.

Degree Requirements

The total course requirements necessary to complete the MAcc degree will vary depending on the background of the student. Students without an undergraduate accounting degree will be required to take a core of undergraduate accounting courses in addition to the graduate courses required for the degree. See para. B.5. of the Admission Requirements above. A student with an academic background in accounting will need to take 10 graduate-level courses (30 semester credit hours) and should be able to complete the degree in two or three semesters depending on the number of courses a student desires to take in a semester.

The graduate course work for the MAcc degree includes four required courses in accounting theory, applied professional research, legal aspects of business, and information resource management. In addition, the student must take five accounting electives from a list of courses that cover fraud examination, taxes, cost management, auditing, international financial reporting standards, and advanced financial accounting. Finally, the student must take one non-accounting elective from a list that includes courses on human resource management, international management, and organizational communications.

	Courses Required	**Credits**	**Semester Offered**
MIS 770	Information Resources Management	3	Fall
Acct 750	Accounting Theory	3	Fall
Busn 730	Legal Aspects of Business	3	Spring
Acct 735	Applied Professional Research	3	Spring
	Total Required Credit Hours	12	
	Select 5 courses from the following list	15	**See Note 1**
Acct 755	Financial Statement Analysis		Fall starting Fall 2010
Acct 640	Management Control Systems		Spring
Acct 615	Advanced Accounting		Fall
Acct 619	Tax Accounting II (Corporate Tax)		Spring/Fall
Acct 610	Fraud Examination		Spring/Fall
Acct 611	Advanced Fraud Examination		Spring
Acct 622	Audit II		Spring/Summer

Acct 625	Government and Not-for-Profit Accounting		Fall
Acct 725	International Financial Reporting Standards		Spring
	Select 1 course from the following list	3	
Comm 783	Organizational Communication I		
Comm784	Organizational Communication II		
Busn 750	Organizational Behavior		
Busn 650	Human Resource Management		Spring/Fall/Summer
Busn 654	International Management		
Comm 612	Gender and Communication		
Comm 786	Risk in Communication		
TL 727	Organizational Change Management		

Total Credit Hours required for Accounting Masters Degree 30

Notes

1	Students cannot take the 600-level course if they took the 400-level course
2	Students must complete a minimum of 15SH at the 700-level
3	Summer courses are offered if sufficient students register to take the class.

Students that do not have an undergraduate accounting degree from NDSU

Additional accounting elective if you did not take these courses as part of your undergraduate degree

Acct 620	Accounting Information Systems

You must have completed the following undergraduate courses or their equivalent.

Acct 311	Intermediate Accounting I
Acct 312	Intermediate Accounting II
Acct 320	Cost Management Systems
Acct 418	Tax Accounting I
Acct 421	Audit I

Agribusiness and Applied Economics

Program and Application Information

Interim Department Chair: Dr. Robert Herren

Graduate Coordinator: Dr. Tom Wahl

Department Location: 500 Barry Hall

E-mail Address: **ndsu.agribusiness@ndsu.edu**

Telephone Number: (701) 231-7441

Degree(s) Offered: M.S.

Application Deadline: March 1 to be considered for financial assistance

Test Requirements

GRE (all applicants not receiving their baccalaureate degrees from U.S. or Canadian universities and all applicants who wish to be considered for a graduate assistantship.)

English Proficiency Requirements

TOEFL iBT 79

IELTS 6

Program Description

The Department of Agribusiness and Applied Economics offers two Master of Science degrees:(1) Agribusiness and Applied Economics, and (2) International Agribusiness. Graduates of both programs are prepared to analyze important agricultural development, finance, marketing, policy, production, resource, international trade, and transportation and logistical issues facing society.

The Agribusiness and Applied Economics Master of Science degree include areas of specialization in applied economics, agribusiness, and transportation and logistics.

Graduate Faculty

Cole R. Gustafson, Ph.D.
University of Illinois, 1986
Research Interests:
Renewable Energy and Agricultural Finance

Joleen Hadrich, Ph.D.
Michigan State University, 2009
Research Interests:
Production Ecnomics, Farm Business Management, Agricultural Risk Management, Econometrics

Robert Hearne, Ph.D.
University of Minnesota, 1995
Research Interests:
Natural Resource and Environmental Economics

Robert S. Herren, Ph.D.
Duke University, 1975
Research Interests:
Economic History, Labor, Money and Banking

Jeremy Jackson, Ph.D.
Washington University in St. Louis, 2008
Research Interests:
Microeconomics, Political Economy, Public Finance

Won W. Koo, Ph.D.
Iowa State University, 1974
Research Interests:
International Trade, Grain Marketing

The Applied Economics area emphasizes course work in economic theory, research methods, and quantitative techniques. The option is designed to prepare students for careers in agricultural economics research in private and public sectors and for Ph.D. programs at other institutions.

The Agribusiness specialization is a broad-based program which combines training in agribusiness management, economic analysis, and agricultural sciences. Training may include biotechnology, processing, and food and environmental safety. Students are prepared for a variety of successful careers in agribusiness by fulfilling the requirements for expertise in quantitative methods and developing a rigorous background in economic theory and research.

The Departments of Agribusiness and Applied Economics and Civil Engineering, in conjunction with the Upper Great Plains Transportation Institute, offer an interdisciplinary graduate program in multimodal transportation. The program includes rural and non-metropolitan planning, highway and railroad engineering, freight transportation operations and economics, and agribusiness logistics and distribution. Both thesis and comprehensive study options are available.

A Master of Science program in Natural Resource Management, with an emphasis in social science, is also available (see the section on Natural Resource Management).
Students of all options have complete access to well-equipped research facilities and to faculty supervision time. (A favorable faculty to student ratio is maintained.) The department has an excellent placement record with national and international agricultural and business firms as well as government agencies.

Ryan Larsen, Ph.D.
Texas A&M University, 2009
Research Interests:
Agricultural Finance, Risk Management

F. Larry Leistritz, Ph.D.
University of Nebraska, 1970
Research Interests:
Economic Development, Resource Economics

Siew Hoon Lim, Ph.D.
University of Georgia, 2005
Research Interests:
Production Economics, Transportation, Industrial Organization

Gregory McKee, Ph.D.
University of California, Davis, 2006
Research Interests:
Industrial Organization, Agribusiness, Cooperatives

Dragan Miljkovic, Ph.D.
University of Illinois, 1996
Research Interests:
Agricultural Prices, International Trade, Agricultural and Food Marketing and Policy

Frayne Olson, Ph.D.
University of Missouri, 2007
Research Interests:
Crop Marketing Strategies, Crop Supply Chain Management, Agricultural Contracting, Agricultural Risk Management

Timothy Petry, Ph.D.
M.S. Agricultural Economics, NDSU, 1973
Research interests.
Livestock marketing

Admission Requirements

The Department of Agribusiness and Applied Economics graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, an applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. At the baccalaureate level, have earned a cumulative grade point average (GPA) of at least 3.0 or equivalent.
3. Have adequate preparation in microeconomic theory, calculus, and statistics.
4. Show potential to undertake advanced study and research as evidenced by academic performance and experience.
5. The department also requires Graduate Record Exam (GRE) and TOEFL scores from students who have not received their baccalaureate degree from U.S. or Canadian universities. Furthermore, the GRE is required of all applicants who wish to be considered for a graduate assistantship.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show potential for successful graduate study, may be admitted under a conditional status. Evidence must be provided showing that the applicant's potential is not adequately reflected by his/her record. After meeting the specified standards of performance set by the department, the student, in consultation with the major adviser, may request a change to full graduate standing.

It is desirable that students begin their program in the fall semester, although students may also begin their programs of study in January. The application for fall admission should be received by the Graduate School by March 1 if the student wishes to be

Richard Rathge, Ph.D.
Michigan State University, 1981
Research Interests:
Demographic Analysis, Labor Force Analysis, Rural Community Research, and Population Impact Assessment

David Roberts, Ph.D.
Oklahoma State University, 2009
Research Interests:
Natural Resource and Environmental Economics, Econometrics, Production Agriculture

David M. Saxowsky, J.D.
The Ohio State University, 1979
Research Interests:
Agricultural Law

Saleem Shaik, Ph.D.
University of Nebraska, 1998
Research Interests:
Agriculture Policy and Risk Management, Agriculture Production Economics

Cheryl J. Wachenheim, Ph.D.
Michigan State University, 1994
Research Interests:
Agribusiness

Tom Wahl, Ph.D.
Iowa State University, 1989
Research Interests:
International Marketing and Trade, Agricultural Trade Policy, Marketing and Price Analysis

William W. Wilson, Ph.D.
University of Manitoba, 1980
Research Interests:
Commodity Marketing, Agribusiness, Industrial Organization

considered for financial assistance. Application for admission to graduate school should be as far in advance as possible, in all cases at least one month prior to the next registration date. International students are advised to submit applications by no later than March 1st to ensure VISA documents will be completed for a fall matriculation.

Financial Assistance

The Department offers assistantships on a competitive basis. Information about other forms of financial assistance may be obtained from the Financial Aid Office in Ceres Hall. Two types of assistantships are available: the Graduate Research Assistantship (GRA), and the Teaching Assistantship (TA).

The GRA and TA provide a monthly stipend plus tuition waiver. Regardless of the type of assistantship, the student must pay an activity fee each semester. An assistantship normally begins the first semester the student is both at full graduate standing and enrolled in courses that apply to the student's graduate program of study.

Application for financial assistance should be made to the department at the same time as application to the graduate school. Applicants to graduate school who are accepted in less than full standing will not be eligible for an assistantship until their status changes to full standing. Granting assistantships depends on academic performance, departmental needs, and availability of assistantships. Application forms may be obtained from the department.

Most assistantships are half time. Students on assistantships are expected to perform research and other duties in the department in return for their stipend. All half-time assistants are expected to be available for performing services related to research or other duties for an average of 20 hours per week. Time expended on the student's research project is recognized as partial fulfillment of this requirement.

Degree Requirements

Candidates meeting all prerequisites for the M.S. degree in Agribusiness and Applied Economics may complete their program in 15-18 months. The degree requires the completion of 30 credit hours of letter-graded course work with an overall GPA of 3.0 or higher. A faculty seminar and an oral defense of either a research-based thesis or paper are required. Plans of study are developed to meet both disciplinary requirements and special interests of the student.

Students pursuing a Master of Science in Agribusiness and Applied Economics (thesis option or comprehensive study option) must complete all core courses. Students select elective courses (with approval of their adviser and supervisory committee) to fulfill the remaining Graduate School credit requirements. The core requirements assure breadth and competence in key areas of knowledge and professional activity. It is required that students **have competence in calculus, multiple regression analysis, and intermediate microeconomic** before enrolling in core courses. Students who are on a departmental research assistantship must complete a thesis. The following courses, or their equivalent, constitute the core of the Master of Science program for each area of specialization:

M.S. in Agribusiness and Applied Economics

Required:

AGEC 701 (1 credit) Research Philosophy
ECON 710 (3 credits) Advanced Econometrics
AGEC 739 (3 credits) Analytical Methods for Applied Economics
AGEC 741 (3 credits) Advanced Microeconomics
AGEC 797/798 Comprehensive Study or Thesis

Thesis Option:

- Minimum of 16 credits of approved graduate-level course work
- 6 to 10 credits of AGEC 798 (Thesis)
- Minimum of 30 credits of course work and thesis credits

Comprehensive Study Option:

- Minimum of 7 credits of quantitative courses (including ECON 610, ECON 710, AGEC 739, AGEC 711 or other approved quantitative courses)
- Minimum of 21 credits of approved graduate-level course work
- 2 to 4 credits of AGEC 797 (Comprehensive Study)
- Minimum of 30 credits of course work and comprehensive study credits

Agricultural and Biosystems Engineering

Program and Application Information

Department Chair: Leslie Backer

Graduate Coordinator: Dr. Dennis Wiesenborn

Department Location: Agricultural and Biosystems Engineering Building

E-mail Address: **ndsu.abengrad@ndsu.edu**

Telephone Number: (701) 231-7261

Degree(s) Offered: Ph.D, M.S.

Application Deadline: Applications are accepted year-round

English Proficiency Requirements

TOEFL iBT 79

IELTS 6

Program Description

The Department of Agricultural and Biosystems Engineering offers graduate study leading to M.S. and Ph.D. degrees. The program emphasizes solving engineering problems for agricultural production, food and value-added processing, and environmental resources management. Advanced work may involve specialized training in the following areas: irrigation engineering and management, food engineering, value-added processing, bioprocessing, agricultural machine systems, machine vision and intelligent sensors for biological systems, post-harvest handling and storage of biological materials, agricultural hydrology, soil and water resources management, and biorenewable energy.

Graduate Faculty

Leslie F. Backer, M.S.
North Dakota State University, 1972
Research Interests:
Crop Quality and Processing

Ganesh Bora, Ph. D.
Kansas State University, 2005
Research Interests:
Precision Agricultural Technology; Machinery Systems Engineering; Agricultural Systems Management; Mechanical Harvesting; Agricultural Energy; Instrumentation

Igathinathane Cannayen, Ph.D.
Indian Institute of Technology, 1997
Research Interests:
Biomass Harvest, Storage, Collection and Pre-Processing

Robert Evans (adjunct), Ph.D.
Colorado State University, 1981
Research Interests:
Irrigation Engineering

Prabhakar R. Guduru (adjunct), MD.
Kakatiya Medical College, India, 1980
Research Interests:
Biomedical research

Kenneth J. Hellevang, Ph.D.
North Dakota State University, 1989
Research Interests:
Post Harvest Technology

Xinhua Jia, Ph.D.
University of Arizona , 2004
Research Interests:
Soil and Water Engineering, Hydrology

Student research and academic programs are tailored to individual student needs and interests. Interdisciplinary approaches to agricultural and biosystems engineering programs are fostered.

Admission Requirements

The Department of Agricultural and Biosystems Engineering graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full standing to the program, the applicant must

1. Hold a baccalaureate degree in engineering or have taken the equivalent of the basic undergraduate engineering courses from an educational institution of recognized standing.
2. Show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) of at least 3.0 on a 4.0 point scale or equivalent.

Financial Assistance

Research assistantships are available and dependent on the grant funding of faculty research programs. Applicants are considered on the basis of scholarship and potential to undertake advanced study and research. Students must be accepted into the Graduate School before they are eligible for an assistantship.

Degree Requirements

M.S. Degree

The M.S. degree program requires completion of 30 semester credit hours beyond the baccalaureate degree. Twenty-four credit hours are from course work while six credit hours are typically provided for a master's thesis. A Plan of Study should be

Zhulu Lin, Ph.D.
University of Georgia, 2003
Research Interests:
Water and Soil Resources

Scott W. Pryor, Ph.D.
Cornell University, 2005
Research Interests:
Biorenewable Products and Bioprocessing

Shafiqur Rahman, Ph.D.
University of Manitoba, 2004
Research Interests:
Livestock Waste Management

Thomas S. Scherer, Ph.D.
University of Minnesota, 1986
Research Interests:
Soil and Water Resources Management

Dean D. Steele, Ph.D.
University of Minnesota, 1991
Research Interests:
Irrigation and Environmental Engineering

Dennis P. Wiesenborn, Ph.D.
Rice University, 1989
Research Interests:
Food and Added Value Process Engineering for Food, Biofuels, and Other Bioproducts

developed with the adviser by the end of the first semester of work. An oral examination covering the research-based paper or thesis and the student's understanding and ability to apply the subject matter to the research is required. Students typically require two years to complete their MS degree. An overall GPA of 3.0 or higher must be maintained.

Ph. D. Degree

Students entering the MS program usually have a BS degree in engineering; however, students without an engineering degree may pursue the MS degree following the completion of basic engineering science courses.

Ph.D candidates are encouraged to indicate their research interests when applying for admission and to select an adviser before entering the program. Typically, three years are required to complete the Ph.D. program after the completion of an MS degree.

The degree requirements are in accordance with the NDSU Graduate School requirements. The student's academic advisor will usually be selected during the acceptance process. Prior to the end of the first academic year, the student and academic advisor will arrange for appointment of a Graduate Advisory Committee.

The student and major advisor will prepare a plan of study by the end of the first year in residence. The student's Graduate Advisory Committee, the ABEN Department Chair, Dean of the College of Engineering and Architecture, and the Graduate School Dean shall approve the program of study. The plan of study must be filed in the Graduate School of NDSU. An overall GPA of 3.0 or above must be maintained.
The ABEN Ph. D. program requirements are:

- 60 credits after the M.S. or 90 credits after the B.S.
- A minimum of 27 credits from NDSU courses numbered 601-689 and 700-789, at least 15 credits of which must be numbered 700-789
- A minimum of 30 credits of NDSU ABEN dissertation and graduate seminar after the M.S. or 45 credits after the B.S.
- A minimum of 9 credits of NDSU ABEN courses numbered 601-689 and 700-789, or 15 credits if entering with other than an ABEN B.S.

- It is expected that one or more journal articles will be submitted for publication prior to the award of the degree

Examinations

Comprehensive Examinations: Both a written and an oral examination will be taken after completion of the greater portion of the course work phase of the Ph.D. program. The written examination will be conducted to test the student's understanding and ability to apply the subject matter related to the chosen research area(s). The format and sequence of the written and oral examinations are dependent on the academic advisor and the examining committee. The examination will be graded pass, fail or marginal pass. If the student does not pass the written component of the comprehensive examination, the student will be provided another opportunity to pass the examination. If the student does not pass the written examination second time, the student must wait one semester before taking the examination for the third time. Failure of the third attempt will not allow the student to proceed further in the Ph.D. program.

The oral examination will also be coordinated by the academic advisor. In this examination, the student will be required to provide a short presentation of the research progress to the date of the oral examination. The format of the examination is dependent on the academic advisor and the examining committee. This examination is to assess the student's ability to communicate his/her research problem, and how he/she is applying scientific and engineering principles to solve the research problem. This examination may be used by the committee to further ascertain the student's level of understanding of subject matter as observed from the written examination. This examination is graded pass or fail. If a student fails the oral examination, the student will be advised of the deficiencies and will be given a second opportunity to pass the examination. If the student does not pass the examination in the second time, the student must wait one semester before taking the examination for the third time. Failure of the third attempt will not allow the student to proceed further in the Ph.D. program.

Successful completion of both written and oral examinations will formally admit the student into candidacy for the Ph.D. in Agricultural and Biosystems Engineering. At least one semester must elapse between admission to candidacy and final PhD. oral examination of the dissertation.
Final Examination: After the research work is completed, the student will write a Ph.D. dissertation following the guidelines of the Graduate School. The final oral PhD. examination will

be arranged after the approval of his/her academic advisor. The complete Ph.D. dissertation will be distributed to the examining committee members a minimum of two weeks before the final examination. The student will present the complete research work during this final examination. After passing the final examination, the student will complete all the appropriate suggested changes of the committee. The student will follow the procedures as defined by the Graduate School to complete the submission of the Ph.D. dissertation.

Animal Science

Program and Application Information

Department Head: Dr. Greg Lardy

Department Location: 102 Hultz Hall

Telephone Number: (701) 231-7641

Degree(s) Offered: Ph.D, M.S.

Application Deadline: April 15, but applications are accepted year-round

English Proficiency Requirements

TOEFL iBT 71

IELTS 6

Program Description

The Department of Animal Sciences offers graduate study leading to M.S. and Ph.D. degrees. Advanced work may involve specialized training in the following areas: animal breeding, animal nutrition, physiology of reproduction, nutritional physiology, and meat science.

Student research and academic programs are tailored to individual student needs and interests. Interdisciplinary approaches to Animal Sciences programs are fostered.

Admission Requirements

The Department of Animal Sciences graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must:

1. hold a baccalaureate degree from an educational institution of recognized standing.
2. have adequate preparation in animal sciences or in a complementary area of life sciences, have a background or interest in agriculture, and show potential to undertake

Faculty

Marc L. Bauer, Ph.D.
University of Kentucky, 1996
Research Interests:
Nutritional Physiology with emphasis on Nutrient Metabolism and Utilization in Ruminants

Erika Berg, Ph.D.
University of Missouri, 2006 Research Interests:
The Impact of Therapeutic Horsemanship on Human and Eguine Participants.
Maternal and Environmental Influence on Equine Neonatal Physiology

Eric P. Berg, Ph.D.
Purdue University, 1996.
Research Interests:
Influence of Environment, Nutrition, and Genetic Factors as They Impact Meat-Animal Production Efficiency, Health, Carcass Composition, and Meat Quality

Paul T. Berg, Ph.D.
North Dakota State University, 1975
Research Interests:
Genetic Selection and Production Parameters, Genetic Implications in Meat Production and Consumer Acceptance, Nutritive Evaluation of Meat

David L. Berryhill, Ph.D.
Iowa State University, 1971
Research Interests:
Zoonotic Diseases

advanced study and research as evidenced by academic performance and experience.

3. at the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent.

Financial Assistance

Research assistantships are available. Applicants are considered on the basis of scholarship and potential to undertake advanced study and research. To be considered for an assistantship, a completed Graduate School application, official transcripts, three letters of reference, and a TOEFL score for international applicants must be submitted to the Graduate School no later than April 15.

Degree Requirements

The Animal Sciences program has two options for the M.S. degree: the thesis option and the comprehensive study option. The M.S. program requires completion of 30 semester credits of approved graduate and letter-graded course work with an overall GPA of 3.0 or better. The Ph.D. program requires the completion of 90 semester credits (or the equivalent) of graduate approved and letter graded course work with an overall GPA of 3.0 or more.

Each student must choose an adviser, usually based upon area of academic and research interest, within the first program year. By the end of the first year of residence, the student must have selected an advisory/supervisory committee and have an approved graduate plan of study, including a research proposal. The advisory/supervisory committee advises the student and administers the graduate exams to the student. Students are referred to the Animal Sciences Graduate Student Handbook for information regarding additional requirements.

David S. Buchanan, Ph.D.
Ph.D. Univerisity of Nebraska, 1979
Research Interests: Quantitative Genetics

Kassey Maddock Carlin, Ph.D.
Iowa State University, 2005
Research Interests:
Meat Science with emphasis on Physiological and Biochemical Changes in Muscle Postmortem on Meat Quality

Joel S. Caton, Ph.D.
New Mexico State University, 1987
Research Interests:
Ruminant Nutrition with emphasis on Nutrition and Reproduction interactions, Forage Utilization, Digestive Physiology and Selenium Metabolism

Thomas P. Colville, DVM, M.Sc.
University of Minnesota, 1971
Research Interests:
Veterinary Technology

Russell B. Danielson, M.S.
North Dakota State University, 1973
Research Interests:
Productions Systems and Management of Beef Cattle

Anna T. Grazul-Bilska, Ph.D.
University of Agriculture and Technology, Olsztyn, Poland, 1983
Research Interests:
Applied and Basic Aspects of Embryology and Ovarian Function in Livestock Species

Carolyn Hammer, DVM, Ph.D.
Iowa State University, 2003
Research Interests:
Equine Preventative Medicine, Growth and Development, Immunology

Candidates for the M.S. normally complete their degree requirements in two years. Candidates for the Ph.D. generally complete their degree requirements in three to four years.

The M.S. candidates are required to take an oral examination which covers both the research and academic subject matter covered in their program. Candidates for the Ph.D. are required to take a preliminary written and oral examination directed toward the academic subject matter of their chosen discipline and a final defense of a research based thesis.

Greg Lardy, Ph.D.
University of Nebraska, 1997
Research Interests:
Cow-Calf Nutrition, By-Product Utilization, Range Nutrition

Justin Luther, Ph.D.
North Dakota State University, 2006
Research Interests:
Nutrition and Reproductive Physiology of Sheep

Rob Maddock, Ph.D.
Texas A&M University, 2000
Research Interests:
Factors Affecting Beef Quality and Value, Consumer Acceptance of Meat Products

Bert L. Moore, Ph.D.
North Dakota State University, 1975
Research Interests:
Live Animal Evaluation, Production, Management and Applied Nutrition of Sheep and Beef

David Newman, Ph.D.
North Dakota State University, 2009
Research Interest:
Swine Production with an Emphasis in Meat Sciences, Animal Handling/Welfare, Consumer Acceptance, and Meat Animal Production

Chung S. Park, Ph.D.
Virginia Polytechnic Institute and State University, 1975
Research Interests:
Nutritional Regulation of Animal Growth, Mammary Development and Lactation

Dale A. Redmer, Ph.D.
University of Missouri, 1983
Research Interests:
Regulation of Ovarian and Uterine Function, Including Angiogenesis and Endocrine Control of Follicular and Placental Development in Farm Animals

Lawrence P. Reynolds, Ph.D.
Iowa State University, 1983
Research Interests:
Maternal and Placental Physiology During Pregnancy in Livestock Including Cellular and Molecular Aspects

Jerome W. Schroeder, Ph.D.
North Dakota State University, 1999
Research Interests:
Metabolic and Nutritional Relationships of Dairy Cattle Related to Milk Quality and Composition

Charles L. Stoltenow, DVM, Diplomate, ACVPM
Iowa State University, 1985
Research Interests:
Equine Medicine, Bovine Medicine, Epidemiology, Public Health and Bioterrorism

Kimberly Vonnahme, Ph.D.
University of Wyoming, 2003
Research Interests:
Nutritional Impacts on Placental Function in Livestock

Sarah A. Wagner, DVM, Ph.D.
Iowa State University, 2003
Research Interests:
Food Animal Pharmacology and Therapeutics, Dairy Cattle Health

In addition to the above listed faculty, there are numerous adjunct faculty members who participate in the graduate program.

Anthropology

Program and Application Information

Department Chair: Dr. Gary Goreham

Department Location: 107 Reinke Visual Arts Gallery

E-mail Address: **ndsu.anthropology@ndsu.edu**

Telephone Number: (701) 231-8657

Degree(s) Offered: M.A., M.S.

English Proficiency Requirements

TOEFL ibT 100

IELTS 7

Program Description

The Department of Sociology and Anthropology offers an M.S. and M.A. degree in Anthropology. The program centers on human heritage past, present and future, cultural and biological and it is based on the principle that graduate level education in Anthropology is a desirable preparation for a growing number of career orientations. The precise plan of study for each student is established in consultation with the academic advisor. Graduate students are also expected to enhance their coursework and degree research by engaging in professional development activities such as paper or poster presentations or attendance at academic conferences, campus and community service, and teaching and research assistantships. Sample positions that our graduates have obtained include university and college teaching, contract archaeology, folklore program coordination, international studies administration, not-for-profit program event coordination, teaching English in other countries, and research analysis as cultural experts.

The focus of graduate education in Anthropology is directed toward both the development of applied anthropologists and the

Faculty

Bill B. Brunton, Ph.D. (emeritus)
Washington State University, 1974
Research Interests:
Cultural Anthropology, Shamanism, Religion, North American Indians, Intergroup Relations

Jeffrey T. Clark, Ph.D.
University of Illinois-Urbana-Champaign, 1987
Research Interests:
Archaeology, Paleoenvironmental Studies, Digital Archaeology, Archaeological Method/Theory, Heritage and Material Culture, Oceania, North America

Timothy J. Kloberdanz, Ph.D. (emeritus)
Indiana University, 1986
Research Interests:
Cultural Anthropology, Expressive Culture and Folklore, Anthropological Theory, Indians of the Plains, Peoples of Europe, Ethnicity, Ethnic Groups and Ethnic Heritage

Thomas J. Riley, Ph.D. (Dean)
University of Hawaii, 1973
Research Interests:
Archaeology, Archaeological Theory, Agricultural Systems, Polynesia, Micronesia, Eastern North America

Joy Sather-Wagstaff, Ph.D.
University of Illinois-Urbana-Champaign, 2007
Research Interests:
Cultural Anthropology, Visual Anthropology, Sociolinguistics, Tourism, Violence/Disasters, Museum Studies, Cultural Heritage and Memory, North America, Latin America and the Caribbean

advanced training of those seeking to pursue a doctoral degree. Students may elect to take courses in a specialty area, or they may pursue a background in general anthropology. Areas of specialization include cultural and biological anthropology and archeology.

The Anthropology graduate program provides students with the opportunity to expand their background and perspectives in research methods and theory. Consequently, the first year of the program is designed to expose students to anthropological theory and a variety of research methods. Research facilities include the Archaeology Technologies Laboratory and Anthropology Materials Laboratory.

Two program options are available for students. In the thesis option, students work on a research-based thesis. Students typically test theoretical assumptions using primary or secondary data. The comprehensive study option is designed for students who wish to combine their studies with some type of specialized field experience. Students electing this option are required to complete a comprehensive study paper related to their internship, such as evaluating a program.

Students in the Anthropology graduate program benefit from a favorable faculty-to-student ratio.

Admission Requirements

The Anthropology graduate program is open to qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in anthropology, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average in all courses of at least 3.0 or equivalent. Applications should be submitted directly to the Graduate School before April 1 of the upcoming academic year.

Financial Assistance

Teaching assistantships are available to qualified applicants. Research assistantships may also be available, contingent on faculty research funds. Applicants for assistantships are considered on the basis of scholarship and potential to undertake advanced study and research. To be

considered for an assistantship, a completed Graduate School application, official transcripts, and three letters of reference must be received by the Graduate School no later than April 1.

Degree Requirements

Students must complete a minimum of 30 credits and a master's thesis for the thesis option, or a minimum of 35 credits and a paper for the comprehensive study option. An oral defense of the thesis or the paper is required.

Requirements for the M.S. or M.A. degree in Anthropology are as follows:

All students must

1. Successfully complete a Theory-oriented anthropology course (such as ANTH 680) or Methods-oriented anthropology course (such as ANTH 650)
2. Complete an additional 24 credits (including thesis) or 26 credits (including comprehensive study).
3. Complete a research-based thesis or comprehensive study paper, and pass an oral defense of the thesis or paper administered by the student's supervisory committee.

Architecture

Program and Application Information

Interim Department Chair: Dr. Ganapathy Mahalingam

Department Location: Klai Hall

Telephone Number: (701) 231-5788

Degree(s) Offered: Master of Architecture

Application Deadline: Contact department for information

English Proficiency Requirements

TOEFL iBT 71

IELTS 6

Program Description

NDSU offers a 5-year, professionally-oriented Master of Architecture program housed primarily in a beautifully-restored historic industrial building in downtown Fargo, which has emerged as an exciting, student-oriented urban district. Most students entering the graduate program in architecture come directly from the NDSU pre-professional Bachelor of Science in Environmental Design program; opportunities for direct entry into the graduate program are limited. The curriculum includes field trips to cities across the country and is supported by a professionally-staffed wood shop, digital media labs, and laser cutter for model-making. Both traditional and digital media are emphasized. An optional semester abroad, plus foreign study tours during summers are offered.

Admissions Requirements

1. Students holding a 4-year pre-professional degree in architecture may apply to the Master of Architecture program at NDSU.

Faculty

Bakr Mourad AlyAhmed, Ph.D.
Environmental Design and Planning, Virginia Tech, 2002
Creative/Research Interests:
Beach Resorts Design, Sustainable Design Modeling, Eco-Tourism Development, Building Capacity Measures, Advanced Environmental Planning.

Mark Barnhouse, M.Arch.
Pratt Institute, 1988
Creative/Research Interests:
Water Resources and the Built Environment, and the Graphic Interpretation of Parametric Data about the Built Environment.

Darryl Booker, M.Arch.
University of Colorado, 1980
Creative/Research Interests:
Sustainable Design, Ethics & Built Environment, Appropriate Technology

Michael Christenson, M.Arch.
University of Minnesota, 1997
Creative/Research Interests:
Commonalities between architectural analysis and design; iterative processes; parametric modeling.

David Crutchfield, M.Arch.
University of Texas at Austin, 2004
Creative/Research Interests:
Sustainable Design, as the interrelation of nature, economics, equity, and aesthetics; Critical evaluation methods of green design; Innovations and analysis in passive design

2. Candidates must have earned a cumulative grade point average of 3.0 or equivalent to be considered for full graduate standing.
3. In addition to submitting the standard graduate application to North Dakota State University, candidates should submit directly to the Department of Architecture and Landscape Architecture a portfolio of their work and a list of architecture courses taken for their undergraduate degree, along with copies of course syllabi.

   These supplemental materials should be submitted to:
   Dr. Ganapathy Mahalingam, Interim Department Chair
   North Dakota State University
   Department 2465
   Fargo, ND 58108

Upon review of the supplemental materials, candidates will be informed of the exact curriculum requirements they must meet to receive the Master of Architecture degree.

Stevie Famulari, MLA
State University of New York , 2000
Creative/Research Interests:
Environmental Art, Public Installations, Radical Materiality, Food Arts,Landscape Architecture, Popular Media, Phytoremediation, Sustainability, Indoor/Outdoor Green Design, Landscape Narratives

Don C. Faulkner, M.Arch.
University of Utah, 1975
Creative/Research Interests:
Urban Design, Building Community and Public Engagement.

Paul H. Gleye, Ph.D.
Urban Planning, UCLA, 1983
Creative/Research Interests:
Place-making, Historic Preservation, City Centers

Mark Lindquist, MLA
University of Toronto, 2002

Kaarin Piegaze Lindquist, M.Arch.
University of Toronto, 2002
Creative/Research Interests:
Design Process, Human Interaction with the Design Process From Brief to Finished Product, Social/Environmental Sustainability

Ganapathy Mahalingam, Ph.D.
University of Florida, 1995
Creative/Research Interests:
Computer-aided architectural design, architectural acoustics, computational modeling of design, interdisciplinary research, architectural philosophy and the Architectural Genome Project

Steve C. Martens, M.Arch. II
Architecture and Historic Preservation, University of Minnesota, 1988
Creative/Research Interests: Architectural Problem-Solving, Design Methods, Historic Preservation, Building Materials

Kathleen Pepple, MFA, MCRP
University of North Dakota, 1981;
North Dakota State University, 1991
Creative/Research Interests:
Applied research in urban agriculture, its economic influence as a local food source, and its importance as a focal point for community participation; In exploration of the possibilities of functional art within this framework, her north Fargo urban art fence expands the utility of boundaries and perimeters necessary in the context of municipal gardens and farms.

Ronald H.L.M. Ramsay, M.Arch.
Architecture (Historic Preservation), University of Texas at Austin, 1992
Creative/Research Interests: Architectural History, Historic Preservation, the Progressive Era, Planning History, Professionalization

Regin Schwaen, M.A.A.
City Building , Arkitektskolen i Aarhus, Denmark, 1992
Creative/Research Interests: Urban Buildings, Conceptual Models, Minimal Concrete Structures, Visual Communication

Cindy Urness, M.Arch.
Pratt Institute, 1988
Creative/Research Interests:
Building Technology, Urban Design, Utopian Cities, Sustainable Design, Universal Design

Catherine Wiley, MLA
University of Pennsylvania, 1998

Stephen Wischer, M.Arch., MFA
University of Calgary, 2004
Creative/Research Interests:
History /Theory, Existential Philosophy, Interdisciplinary Relationships, Art, Embodied Artifacts, Process, Experience and Poetics, and of Design

Biochemistry

Program and Application Information

Department Chair: Dr. Greg Cook

Department Location: Ladd Hall

E-mail Address: NDSU.chemistry@ndsu.edu

Telephone Number: (701)231-8694

Degree(s) Offered: Ph.D., M.S.

Application Deadline: May 1

Test Requirements

GRE (general required; subject recommended)

English Proficiency Requirements

TOEFL ibT 81 (23 speak; 21 write) – TA; 71 – RA

IELTS 6.5 – TA; 5.5 – RA

Program Description

The Program in Biochemistry and Molecular Biology offers graduate study leading to the M.S. and Ph.D. degrees. The department also participates in the interdisciplinary Ph.D. program in Cellular and Molecular Biology.

At the start of the first year of study, entering graduate students take entrance examinations in biochemistry and molecular biology, as well as analytical, inorganic, organic, and physical chemistry. The graduate student progress committee uses these exams for advisory purposes in recommending course work during the first year. As a consequence, programs are individually tailored to the needs of each student.

The chemistry, biochemistry, and molecular biology of plant, animal, insect, and microbial systems are studied through advanced course work and research. Selection of the area of emphasis depends on the interests of the student. Typically, coursework is completed in one to one-and-a-half years for M.S.

Faculty

Christopher L. Colbert, Ph.D.
Purdue University, 2000;
Postdoctoral, Howard Hughes Medical Institute, 2000-2004
Research Interests: Structure Biology

Glenn Dorsam,Ph.D.
Virginia Commonwealth University,1998;
Postdoctoral, University of California, San Francisco, 1998-2002
Research Interests:
Transcriptional Regulation

Heldur Hakk, Ph.D. (adjunct)
North Dakota State University, 1997
Research Interests:
Fate and Metabolism of Environmental Contaminants

Stuart J. Haring, Ph.D.
University of Iowa, 2004;
Postdoctoral, University of Iowa, 2004-2008
Research Interests: DNA Metabolism and Cell Cycle Regulation

S. Derek Killilea, Ph.D.
National University of Ireland (Galway), 1972
Research Interests:
Metabolic Regulation via Protein Kinases and Phosphatases

candidates, and two years for Ph.D. candidates, leaving later years for full-time thesis research. The typical time to complete a graduate degree averages three years for the M.S. degree and approximately five years for the Ph.D.

Admissions Requirements

The graduate programs in Biochemistry are open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation for the study of biochemistry and molecular biology at the graduate level, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a minimum cumulative grade point average (GPA) of 3.0 or equivalent in all courses.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show potential for successful graduate study may be admitted under a conditional status. Evidence must be provided showing that the applicant's potential is not adequately reflected by his/her record. After meeting the specified standards of performance by the department, the student in consultation with the major adviser may request a change to full graduate standing. The student may not earn more than 12 semester hours of graduate credit in the conditional status. The request for change must be submitted to the Dean of the Graduate School by the major adviser and approved by the department chair.

Erika Offerdahl, Ph.D.
University of Arizona, 2008
Research Interests:
Chemistry/Biochemistry Education

Sangita C. Sinha, Ph.D.
Purdue University, 2000;
Postdoctoral, Howard Hughes Medical Institute, 2001-2005
Research Interests: Structure Biology

D. K. Srivastava, Ph.D.
Banaras Hindu University, 1980
Research Interests:
Mechanistic Enzymology

Applications will be considered at any time. Application materials should be submitted directly to the Graduate School and need to be received before May 1 to be considered for the upcoming academic year.

Financial Assistance

The student must first apply to the Graduate School and be accepted in full or conditional status before he/she is eligible for an assistantship in the Department of Chemistry and Molecular Biology.

Graduate students in the Department of Chemistry and Molecular Biology are supported during both the academic year and during summer months by either teaching assistantships (TA) or research assistantships (RA).). As of the 2009-2010 academic year, the standard monthly stipend is $1,683 per month for RAs and $1,750 per month for TAs. University tuition (except for a student activity fee) is waived for all TAs and RAs in good academic standing.

Degree Requirements

The Master of Science program requires the completion of a total of 30 graduate semester credits with an overall GPA of 3.0 or better. This total is comprised of both class work and research credit, but must consist of at least 16 semester credits from letter-graded course work. The Ph.D. program requires the completion of a total of 90 graduate semester credits with an overall GPA of 3.0 or better. This total is comprised of both class work and research credit, but must consist of at least 27 semester credits from letter-graded course work.

Each student chooses a thesis adviser within six months of beginning graduate school. As this is one of the most important decisions made in graduate school, students are strongly urged to visit multiple faculty members to discuss research opportunities. In addition, faculty seminars during the fall semester are designed to acquaint new students with the available research programs.

By the end of the first academic year, each student selects an advisory and examination committee, which consists of the thesis adviser, two other faculty members in the chemistry department, and one faculty member from a department outside the department of Chemistry and Molecular Biology.

Admission to candidacy for the Ph.D. degree is accomplished by satisfying three requirements: 1) satisfactory performance in course work with a minimum 3.0 grade-point average, 2) satisfactory performance on a written comprehensive examination, taken by the end of the 4th semester, and 3) satisfactory defense of an original research proposal on a topic approved by the student's advisory committee. The defense of this proposal must occur at least eight months prior to the final oral examination. Following completion of dissertation research, the candidate must complete a written dissertation and an oral presentation to the department and advisory committee.

Research Opportunities and Infrastructure

The Department of Chemistry and Molecular Biology has more than 10 externally funded faculty research programs. Research expenditures have averaged $1.8 million over the last 10 years, with more than $2.2 million in the last 2 years.

All research and most teaching activities within the department occur within three centrally-located buildings, including two connected facilities, Ladd Hall and Dunbar Laboratory, as well as the Industrial and Agricultural Communications Center (IACC) located across the street. Most departmental offices, classrooms and teaching labs as well as some research labs are located in Ladd Hall, while Dunbar and the third floor of the IACC primarily consists of research laboratories. Ladd Hall also houses departmental glass, machine, and electronics shops. Modern instrumentation is vital to research in the chemical sciences. The quality and quantity of instrumentation within the department has been greatly enhanced in the last few years through aggressive fund-raising efforts and university matching support.

The department has recently upgraded its mass spectrometry capabilities to include a Bio-TOF III with accurate mass analysis, ESI and CI ionization; as well as an Esquire 3000 Plus - an Ion trap instrument with MS-MS and proteomics capabilities. A dedicated LC can be integrated with the both the instruments.

The Organic Spectroscopy Laboratory is primarily devoted to maintenance and operation of Nuclear Magnetic Resonance (NMR) spectrometers. The recently upgraded facility includes three modern high-field instruments: Varian 500, 400, and 300 MHz spectrometers. All have multinuclear, 2-D, and variable temperature capabilities, and the 400 MHz instrument has been recently upgraded for solids capabilities. This center also includes the departmental FTIR.

The Materials Characterization Laboratory houses the departmental crystallography faculties including a Bruker single crystal CCD X-ray diffractometer with low temperature capabilities, a Philips MPD (Multi-Purpose Diffractometer), two Philips X-ray powder diffractometers, and a Kevex X-ray fluorescence unit. CHN Elemental analysis, thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), and differential thermal analysis (DTA) are also available.

The Center for Protease Research - Core Biology Facility is a new facility housing equipment and technical personnel for performing bioassay, cell and tissue culture, and molecular biology experiments. For bioassays, the facility has a fluorimeter capable of top or bottom reading and the capability to handle both 96- and 384-well plates. For sample preparation, researchers can utilize cell and tissue culture capabilities such as flow hoods and culture chambers. In addition, RT-PCR and FPLC protein purification technology is available.

The chemistry library, located in Ladd Hall, provides graduate students and faculty with convenient 24-hour access to more than 200 journals and approximately 10,000 volumes. Literature searching via SciFinder is supported.

Prospective students are encouraged to visit the Department of Chemistry and Molecular Biology Web site (www.chem.ndsu.nodak.edu) for the latest descriptions of research programs and instrumentation.

Biological Sciences-Biology

Program and Application Information

Department Chair: Dr. William Bleier

Department Location: 218 Stevens Hall

Telephone Number: (701)231-7087

E-mail Address: NDSU.Biology.GSA@ndsu.edu

Degree(s) Offered: M.S.

Application Deadline: January 15 if seeking a teaching assistantship or fellowship, but applications are accepted year-round

Test Requirements

GRE (general)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Department of Biological Sciences offers graduate study leading to Master of Science and Doctor of Philosophy degrees. Master of Science degrees are available in Biology, Botany, Environmental and Conservation Sciences, Natural Resources Management, and Zoology. Doctor of Philosophy degrees are available in Botany, Genomics, Cellular and Molecular Biology, Environmental and Conservation Sciences, Natural Resources Management, and Zoology. Advanced work may involve specialized training in the following areas: aquatic biology, behavior, cell biology, comparative biochemistry and physiology, cancer biology, conservation biology, ecology, endocrinology, developmental biology, evolution, fisheries biology, lichenology, molecular biology, plant biology, population biology, prairie pothole ecology, systematics, vertebrate pest management, and wildlife biology.

Faculty

William T. Barker, Ph.D. (adjunct)
University of Kansas, 1968
Animal and Range Sciences, NDSU, Fargo, N.D.

Peggy R. Biga, Ph.D.
University of Idaho, 2003
Research Interests:
Comparative Growth and Nutritional Physiology, Responses of Muscle Growth and Regenerative Capabilities in Response to Varied Macronutrients in Several Vertebrate Taxa

William J. Bleier, Ph.D.
Texas Tech University, 1975
Research Interests:
Blackbirds, Animal Depredation, Avian Ecology

Julia H. Bowsher, Ph.D.
Duke University, 2007
Research Interests: Evolutionary and Developmental Biology of Insects

Deborah P. Buitron, Ph.D. (adjunct)
University of Minnesota, 1982
Research Interests:
Behavioral Ecology of Aquatic Birds

Malcolm G. Butler, Ph.D.
University of Michigan, 1980
Research Interests:
Aquatic Ecology, Limnology, Fisheries, Water Quality, Wildlife Management

Student research and academic programs are tailored to individual needs and interests. Interdisciplinary approaches to biological problems are encouraged.

Correspondence with one or more departmental faculty members before and during the application process is essential.

For e-mail addresses for faculty members and for additional information about our programs, please visit our Web site at **http://biology.ndsu.nodak.edu/**.

Admissions Requirements

The graduate programs in the Department of Biological Sciences are open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in the desired area of advanced study and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent. Students with a graduate degree with a cumulative GPA of at least 3.0 or equivalent may be admitted in full standing.

An applicant who does not meet all requirements for admission or has deficiencies in prerequisite course work, but shows potential for successful graduate study, may be admitted under a

Gary K. Clambey, Ph.D.
Iowa State University, 1975
Research Interests:
Ecology and Biogeography, Environmental Analysis and Planning, Structure Function Relations in Midwestern Ecosystems, Human Ecology

Mark E. Clark, Ph.D.
University of Tennessee, 1996
Research Interests:
Fish and Wildlife Ecology, Population Biology, Ecological Modeling, Quantitative Ecology

Theodore L. Esslinger, Ph.D.
Duke University, 1974
Research Interests:
Lichenology; Taxonomy, Chemosystematics, and Floristics of Lichens; Emphasis on the Parmeliaceae and Physciaceae

Ned H. Euliss, Jr., Ph.D. (adjunct)
Oregon State University, 1989
Research Biologist, U.S. Geological Survey, Northern Prairie Wildlife Research Center, Jamestown, N.D.
Research Interests:
Wetland Ecology

Marvin W. Fawley, Ph.D. (Adjunct)
Miami University, 1985
Research Interests:
Evolution, Diversity, and Systematics of Algae, Particularly Green Algae; Application of Molecular Techniques to Ecological Studies and Identification of Algae.

conditional status. Evidence must be provided showing that his/her record does not adequately reflect the applicant's potential. After meeting the specified standards of performance by the department, the student, in consultation with the major adviser, may request a change to full graduate standing. The major adviser must submit the request for a change to the Dean of the Graduate School after approval by the department chair.

Applications should be submitted directly to the Graduate School before January 15 of the upcoming academic year, if the applicant is seeking a teaching assistantship or a fellowship. Most students initiate their graduate programs in the fall semester, but starting a graduate program in January or June also is possible; therefore, applications will be considered at any time they are submitted.

Financial Assistance

Research assistantships and teaching assistantships are available. Applicants are considered on the basis of scholarship, potential to undertake advanced study and research, as well as financial need. A student must first be accepted by The Graduate School before consideration for financial assistance. Assistantships include a waiver of tuition.

In addition to research and teaching assistantships, there are other types of financial support. A limited number of State Board of Higher Education Scholarships and other fellowships are available through the Graduate School. Outstanding scholarship and financial need are primary considerations for these fellowships. Scholarships in specific areas are also available through the Department of Biological Sciences. These are generally supplemental and do not include tuition waivers. Students are considered for these awards after enrollment, with

Erin H. Gillam, Ph.D.
University of Tennesee-Knoxville, 2007
Research Interests:
Evolution and Behavioral Function of Communication Signals Using Bats as a Model

James W. Grier, Ph.D. (Emeritus)
Cornell University, 1975
Research Interests:
Eagles and Other Birds of Prey, Herpetology, Aquatic Organisms, Fossils, Animal Population Dynamics, Habitat Ecology

Kendra J. Greenlee, Ph.D.
Arizona State University, 2004
Research Interests:
Comparative Physiology, Insect Respiration and Immunology

Mark A. Hanson, Ph.D. (adjunct)
North Dakota State University, 1990
Research Scientist, Wetland Wildlife Populations and Research Group, Minnesota Department of Natural Resources, Bemidji, Minn.
Research Interests:
Wetland Ecology

Donna L. Jacob, Ph.D. (adjunct)
University College Dublin, Ireland, 2003
Research Interests:
Wetland Science, Biogeochemistry

Douglas H. Johnson, Ph.D. (adjunct)
North Dakota State University, 1986
Senior Scientist, USGS, Northern Prairie Wildlife Research Center, St. Paul, MN.
Research Interests:
Quantitative Ecology, Population Biology, Grassland Birds.

primary considerations being scholastic performance and research at NDSU.

Degree Requirements

The Master of Science program generally requires a minimum of 24 months of full-time study, during which an overall GPA of 3.0 or better must be maintained. The Master of Science degree may be earned by either of two options. The thesis option emphasizes completion of a research project. The comprehensive study option requires more course work, and instead of conducting research and presenting a thesis, the candidate presents a paper or papers approved by the adviser to the examining committee, demonstrating ability for scholarly study and written expression. Candidates under both options must present a seminar on the thesis research or comprehensive study, and must pass an oral examination.

The Ph.D. program generally requires a minimum of 36 months of full-time study, during which an overall GPA of 3.0 or better must be maintained. Candidates for the Ph.D. are required to take a preliminary written and oral examination directed to academic subject matter and a final defense of the dissertation.

Most students have selected a major adviser prior to their arrival for graduate studies; however, if a student has not made such a decision, then he/she must select a major adviser within nine months of beginning graduate school. By the end of the first year in residence, the student must select an advisory/supervisory committee. The committee advises/supervises the student and administers preliminary and final oral examinations.

George M. Linz, Ph.D. (adjunct)
North Dakota State University, 1982
Project Leader, Wildlife Biologist, USDA/APHIS Wildlife Services, National Wildlife Research Center, Great Plains Field Station, Bismarck, N.D.
Research Interests:
Development of Methodologies of Managing Blackbird Damage to Sunflower

Andrew M. Marry, Ph.D. (adjunct)
John Innes Centre, 1998
Biology Department, Minnesota State University, Moorhead, MN.
Research Interests:
Plant Cell Walls

Lisa M. Montplaisir, Ph.D.
University of Arizona, 2003
Research Interests:
Science Education, Teaching and Learning, Curriculum Development.

Gary L. Nuechterlein, Ph.D. (Emeritus)
University of Minnesota, 1980
Research Interests:
Behavioral Ecology of Birds; Wildlife Ecology, Particularly of Non-game Species

Marinus L. Otte, Ph.D.
Vrije Universiteit, Amsterdam, The Netherlands, 1991
Research Interests:
Wetland Science, Biogeochemistry, Plant Ecophysiology

Wendy L. Reed, Ph.D.
Iowa State University, 2000
Research Interests:
Physiological Ecology, Evolution of Life Histories, Behavioral Endocrinology

Research Facilities and Equipment

The Department of Biological Sciences occupies approximately 20,000 square feet of floor space in Stevens Hall for research and teaching. The NDSU Library has extensive holdings of journals, monographs, books, and other reference materials covering various fields in biology. The library offers full access to online catalogs and databases.

Faculty in the department have research programs ranging from molecular biology to ecosystem ecology and work with a wide variety of organisms (algae, lichens, angiosperms, invertebrates, and vertebrates). Modern equipment is available for conducting research in cell and molecular biology and field ecology and behavior. The department has access to a vascular plant herbarium with 240,000 specimens emphasizing Northern Great Plains flora, a lichen herbarium consisting of about 15,000 specimens with a worldwide representation of taxa, and a vertebrate collection with approximately 10,000 specimens.

The department offers access to a range of equipment and facilities necessary for laboratory research including greenhouses, animal rooms, growth chambers, tissue culture facilities, ultracentrifuges, spectrophotometers, electrophoresis, light microscopes, gas chromatography, GC-mass spectrometry, and high performance liquid chromatography. Facilities are available for protein and DNA sequencing; oligonucleotide synthesis; interactive laser cytometry; scanning transmission and electron microscopy, and confocal microscopy.

Katie M. Reindl, Ph.D.
North Dakota State University, 2006
Research Interests: Cancer Cell Biology, Identification and Validation of New Drug Targets

M. Hildegard Reiser, Ph.D. (adjunct)
Northern Arizona University, 1988
Program Manager, National Park Service, Chihuahuan Desert Network Inventory & Monitoring Program, Carsbad, N.M.
Research Interests:
Conservation Biology and Ecosystem Management

Nancy Shappell, Ph.D. (adjunct)
Virginia Polytechnic Institute and State University, 1988
Research Physiologist, Animal Metabolism Unit, Biosciences Research Laboratory, USDA/ARS, Fargo, N.D.
Research Interests:
Effect of Xenobiotics (with Potential Agricultural Impact) on Animals

Mark A. Sheridan, Ph.D.
University of California-Berkeley, 1985
Research Interests:
Animal Physiology/Endocrinology; Control of Growth, Development, and Metabolism in Vertebrates, Especially Fish; Aquaculture; Signal Transduction; in vitro Diagnostics

Craig A. Stockwell, Ph.D.
University of Nevada, Reno, 1995
Research Interests:
Evolutionary Ecology of Vertebrate Populations, Conservation Biology, Fisheries Biology

Jeffrey C. Suttle, Ph.D. (adjunct)
Michigan State University, 1980
USDA/ARS, Fargo, N.D.
Research Interests:
Plant Physiology

Steve E. Travers, Ph.D.
University of California, 1998
Research Interests:
Plant Evolutionary Ecology

Gerald L. Van Amburg, Ph.D. (adjunct)
Texas A & M University, 1969
Biology Department, Concordia College, Moorhead, Minn.

Alan R. White, Ph.D. (adjunct)
University of North Carolina, 1981
Biology Department, East Carolina University, Greenville, North Carolina
Research Interests:
Plant Cell Biology; Biosynthesis of Cell Wall Polysaccharides in the Golgi Apparatus; Structure of Polysaccharides and Glycoprotein Oligosaccharides; Science and Mathematics Education

Biological Sciences-Botany/Zoology

Program and Application Information

Department Chair: Dr. William Bleier

Department Location: 218 Stevens Hall

Telephone Number: (701)231-7087

E-mail Address: NDSU.Biology.GSA@ndsu.edu

Degree(s) Offered: Ph.D., M.S.

Application Deadline: March 1, but applications are accepted year-round

Test Requirements

GRE (general)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Department of Biological Sciences offers graduate study leading to Master of Science and Doctor of Philosophy degrees. Master of Science degrees are available in Biology, Botany, Environmental and Conservation Sciences, Natural Resources Management, and Zoology. Doctor of Philosophy degrees are available in Botany, Genomics, Cellular and Molecular Biology, Environmental and Conservation Sciences, Natural Resources Management, and Zoology. Advanced work may involve specialized training in the following areas: aquatic biology, behavior, cell biology, comparative biochemistry and physiology, cancer biology, conservation biology, ecology, endocrinology, developmental biology, evolution, fisheries biology, lichenology, molecular biology, plant biology, population biology, prairie pothole ecology, systematics, vertebrate pest management, and wildlife biology.

Faculty

William T. Barker, Ph.D. (adjunct)
University of Kansas, 1968
Animal and Range Sciences, NDSU, Fargo, N.D.

Peggy R. Biga, Ph.D.
University of Idaho, 2003
Research Interests:
Comparative Growth and Nutritional Physiology, Responses of Muscle Growth and Regenerative Capabilities in Response to Varied Macronutrients in Several Vertebrate Taxa

William J. Bleier, Ph.D.
Texas Tech University, 1975
Research Interests:
Blackbirds, Animal Depredation, Avian Ecology

Julia H. Bowsher, Ph.D.
Duke University, 2007
Research Interests: Evolutionary and Developmental Biology of Insects

Deborah P. Buitron, Ph.D. (adjunct)
University of Minnesota, 1982
Research Interests:
Behavioral Ecology of Aquatic Birds

Malcolm G. Butler, Ph.D.
University of Michigan, 1980
Research Interests:
Aquatic Ecology, Limnology, Fisheries, Water Quality, Wildlife Management

Student research and academic programs are tailored to individual needs and interests. Interdisciplinary approaches to biological problems are encouraged.

Correspondence with one or more departmental faculty members before and during the application process is essential.

For e-mail addresses for faculty members and for additional information about our programs, please visit our Web site at **http://biology.ndsu.nodak.edu/**.

Admissions Requirements

The graduate programs in the Department of Biological Sciences are open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in the desired area of advanced study and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent. Students with a graduate degree with a cumulative GPA of at least 3.0 or equivalent may be admitted in full standing.

An applicant who does not meet all requirements for admission or has deficiencies in prerequisite course work, but shows potential for successful graduate study, may be admitted under a conditional status. Evidence must be provided showing that

Gary K. Clambey, Ph.D.
Iowa State University, 1975
Research Interests:
Ecology and Biogeography, Environmental Analysis and Planning, Structure Function Relations in Midwestern Ecosystems, Human Ecology

Mark E. Clark, Ph.D.
University of Tennessee, 1996
Research Interests:
Fish and Wildlife Ecology, Population Biology, Ecological Modeling, Quantitative Ecology

Theodore L. Esslinger, Ph.D.
Duke University, 1974
Research Interests:
Lichenology; Taxonomy, Chemosystematics, and Floristics of Lichens; Emphasis on the Parmeliaceae and Physciaceae

Ned H. Euliss, Jr., Ph.D. (adjunct)
Oregon State University, 1989
Research Biologist, U.S. Geological Survey, Northern Prairie Wildlife Research Center, Jamestown, N.D.
Research Interests:
Wetland Ecology

Marvin W. Fawley, Ph.D. (Adjunct)
Miami University, 1985
Research Interests:
Evolution, Diversity, and Systematics of Algae, Particularly Green Algae; Application of Molecular Techniques to Ecological Studies and Identification of Algae.

his/her record does not adequately reflect the applicant's potential. After meeting the specified standards of performance by the department, the student, in consultation with the major adviser, may request a change to full graduate standing. The major adviser must submit the request for a change to the Dean of the Graduate School after approval by the department chair.

Applications should be submitted directly to the Graduate School before January 15 of the upcoming academic year, if the applicant is seeking a teaching assistantship or a fellowship. Most students initiate their graduate programs in the fall semester, but starting a graduate program in January or June also is possible; therefore, applications will be considered at any time they are submitted.

Financial Assistance

Research assistantships and teaching assistantships are available. Applicants are considered on the basis of scholarship, potential to undertake advanced study and research, as well as financial need. A student must first be accepted by The Graduate School before consideration for financial assistance. Assistantships include a waiver of tuition.

In addition to research and teaching assistantships, there are other types of financial support. A limited number of State Board of Higher Education Scholarships and other fellowships are available through the Graduate School. Outstanding scholarship and financial need are primary considerations for these fellowships. Scholarships in specific areas are also available through the Department of Biological Sciences. These are generally supplemental and do not include tuition waivers. Students are considered for these awards after enrollment, with primary considerations being scholastic performance and research at NDSU.

Erin H. Gillam, Ph.D.
University of Tennesee-Knoxville, 2007
Research Interests:
Evolution and Behavioral Function of Communication Signals Using Bats as a Model

James W. Grier, Ph.D. (Emeritus)
Cornell University, 1975
Research Interests:
Eagles and Other Birds of Prey, Herpetology, Aquatic Organisms, Fossils, Animal Population Dynamics, Habitat Ecology

Kendra J. Greenlee, Ph.D.
Arizona State University, 2004
Research Interests:
Comparative Physiology, Insect Respiration and Immunology

Mark A. Hanson, Ph.D. (adjunct)
North Dakota State University, 1990
Research Scientist, Wetland Wildlife Populations and Research Group, Minnesota Department of Natural Resources, Bemidji, Minn.
Research Interests:
Wetland Ecology

Donna L. Jacob, Ph.D. (adjunct)
University College Dublin, Ireland, 2003
Research Interests:
Wetland Science, Biogeochemistry

Douglas H. Johnson, Ph.D. (adjunct)
North Dakota State University, 1986
Senior Scientist, USGS, Northern Prairie Wildlife Research Center, St. Paul, MN.
Research Interests:
Quantitative Ecology, Population Biology, Grassland Birds.

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Research Facilities and Equipment

George M. Linz, Ph.D. (adjunct)
North Dakota State University, 1982
Project Leader, Wildlife Biologist, USDA/APHIS Wildlife Services, National Wildlife Research Center, Great Plains Field Station, Bismarck, N.D.
Research Interests:
Development of Methodologies of Managing Blackbird Damage to Sunflower

Andrew M. Marry, Ph.D. (adjunct)
John Innes Centre, 1998
Biology Department, Minnesota State University, Moorhead, MN.
Research Interests:
Plant Cell Walls

Lisa M. Montplaisir, Ph.D.
University of Arizona, 2003
Research Interests:
Science Education, Teaching and Learning, Curriculum Development.

Gary L. Nuechterlein, Ph.D. (Emeritus)
University of Minnesota, 1980
Research Interests:
Behavioral Ecology of Birds; Wildlife Ecology, Particularly of Non-game Species

Marinus L. Otte, Ph.D.
Vrije Universiteit, Amsterdam, The Netherlands, 1991
Research Interests:
Wetland Science, Biogeochemistry, Plant Ecophysiology

Wendy L. Reed, Ph.D.
Iowa State University, 2000
Research Interests:
Physiological Ecology, Evolution of Life Histories, Behavioral Endocrinology

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The department offers access to a range of equipment and facilities necessary for laboratory research including greenhouses, animal rooms, growth chambers, tissue culture facilities, ultracentrifuges, spectrophotometers, electrophoresis, light microscopes, gas chromatography, GC-mass spectrometry, and high performance liquid chromatography. Facilities are available for protein and DNA sequencing; oligonucleotide synthesis; interactive laser cytometry; scanning transmission and electron microscopy, and confocal microscopy.

Katie M. Reindl, Ph.D.
North Dakota State University, 2006
Research Interests: Cancer Cell Biology, Identification and Validation of New Drug Targets

M. Hildegard Reiser, Ph.D. (adjunct)
Northern Arizona University, 1988
Program Manager, National Park Service, Chihuahuan Desert Network Inventory & Monitoring Program, Carsbad, N.M.
Research Interests:
Conservation Biology and Ecosystem Management

Nancy Shappell, Ph.D. (adjunct)
Virginia Polytechnic Institute and State University, 1988
Research Physiologist, Animal Metabolism Unit, Biosciences Research Laboratory, USDA/ARS, Fargo, N.D.
Research Interests:
Effect of Xenobiotics (with Potential Agricultural Impact) on Animals

Mark A. Sheridan, Ph.D.
University of California-Berkeley, 1985
Research Interests:
Animal Physiology/Endocrinology; Control of Growth, Development, and Metabolism in Vertebrates, Especially Fish; Aquaculture; Signal Transduction; in vitro Diagnostics

Craig A. Stockwell, Ph.D.
University of Nevada, Reno, 1995
Research Interests:
Evolutionary Ecology of Vertebrate Populations, Conservation Biology, Fisheries Biology

Jeffrey C. Suttle, Ph.D. (adjunct)
Michigan State University, 1980
USDA/ARS, Fargo, N.D.
Research Interests:
Plant Physiology

Steve E. Travers, Ph.D.
University of California, 1998
Research Interests:
Plant Evolutionary Ecology

Gerald L. Van Amburg, Ph.D. (adjunct)
Texas A & M University, 1969
Biology Department, Concordia College, Moorhead, Minn.

Alan R. White, Ph.D. (adjunct)
University of North Carolina, 1981
Biology Department, East Carolina University, Greenville, North Carolina
Research Interests:
Plant Cell Biology; Biosynthesis of Cell Wall Polysaccharides in the Golgi Apparatus; Structure of Polysaccharides and Glycoprotein Oligosaccharides; Science and Mathematics Education

Business Administration

Program and Application Information

Program Director: Dr. Karen Froelich

Department Location: Barry Hall

E-mail Address: Karen.Froelich@ndsu.edu

Telephone Number: (701) 231-8808

Degree(s) Offered: Master of Business Administration

Application Deadline: International applications are due May 1 for fall semester and August 1 for spring semester. Domestic applicants should apply at least six-weeks prior to the start of classes.

Test Requirements

GMAT

English Proficiency Requirements

TOEFL iBT 79

IELTS 6

Program Description

The Master of Business Administration program at North Dakota State University is a non-thesis, professional program structured to serve qualified students with undergraduate degrees in various fields. The program is designed to provide the student with an effective set of analytical skills, a broad view of the way organizations work, and an understanding of the functional areas of business. The NDSU program takes a generalist approach to graduate business education while providing a variety of electives to give the student the opportunity to pursue a particular area of interest in business or a related discipline.

The NDSU business faculty use a variety of teaching methods: case studies, group and individual projects, field research,

Faculty

Karl Altenburg, Ph.D.
North Dakota State University, 1999
Field:
Management Information Systems

Bahman Bahrami, Ph.D.
University of Nebraska-Lincoln, 1983
Field:
Managerial Economics, Management Information Systems, Labor Relations and Negotiation

John Bitzan, Ph.D.
University of Wisconsin-Milwaukee, 1997
Field:
Economics

William "Bud" Bowlin, Ph.D.
University of Texas at Austin, 1984
Field:
Accounting

Donna Dietz, Ph.D.
University of North Dakota, 1989
Field:
Business Education

Thomas D. Dowdell, Ph.D.
Temple University, 2004
Field:
Accounting

computer applications, class discussion, and lecture. The student is able to acquire and improve problem-solving and communication skills and to apply these skills in business situations.

Financial Assistance

The College of Business Administration offers financial assistance through graduate assistantships and scholarships. Applicants must be admitted on a conditional or full-standing basis. Assistantships include a stipend and tuition waiver in exchange for work within the College.

The tuition waiver is limited to graduate course work and six semester hours of foundation courses. Awards are based on academic excellence as determined by grade point average, high potential as measured by the GMAT score, and the financial needs of the student. Applications may be obtained from the Graduate School or the MBA director's office.

Degree Requirements

The total course requirements necessary to complete the MBA degree will vary depending on the background of the student. An adequate background in the functional areas of business is necessary for all students. Foundation courses include 3 semester credits in the areas of accounting, economics, marketing, management, legal environment, finance, quantitative methods, and management information systems. Foundation courses may be waived for students who have previously completed equivalent courses with satisfactory grades.

All students must complete 30 semester hours of graduate work. Graduate courses include the following core courses: managerial accounting, strategic marketing, operations management,

C. Frederick Eisele, Ph.D.
(professor emeritus)
University of Iowa, 1971
Field:
Labor Management and Negotiation

John Elder, Ph.D.
University of Virginia-Charlottesville, 1995
Field:
Finance, Economics

Karen Froelich, Ph.D.
University of Minnesota, 1994
Field:
Strategic Management

Ronald D. Johnson, D.B.A.
Indiana University, 1970
Field:
Organizational Behavior

Joseph M. Jones, Ph.D.
University of Missouri-Columbia, 1991
Field:
Marketing

Jae Min Jung, Ph.D.
University of Cincinnati, 2002
Field:
Marketing, Cross-Cultural Consumer Behavior, Marketing Ethics.

Bonnie Klamm, Ph.D., CPA
Virginia Commonwealth University-Richmond, 1999
Field:
Accounting Information System

Terry W. Knoepfle, J.D., CPA
University of North Dakota, 1981
Field:
Business Law and Tax Accounting

organizational behavior, financial management, management information systems, strategic management, and business conditions analysis, for a total of 24 semester hours. Students must take an additional six semester hours of approved elective courses.

Joint MBA-Pharm.D. Degree Program

The College of Business Administration and the College of Pharmacy offer a dual degree program where students receive a Pharm.D. degree and an MBA. Pharm.D. students meet the business foundation course requirement through the pharmacy curriculum, and the choice of MBA elective courses is flexible for students in the dual degree program. To be eligible for this joint degree program, students must apply to and be accepted into both the Pharm.D. and the MBA programs. The MBA course work can be completed in one year following completion of the Pharm.D. degree.

Jin Li, Ph.D.
University of Alberta, 2007
Field:
Marketing

Gerry Macintosh, Ph.D.
University of Nebraska-Lincoln, 1992
Field:
Sales and Sales Management

Lori Olsen, Ph.D.
University of Oklahoma, 2001
Field:
Accounting

R. Douglas Rymph, Ph.D.
University of South Carolina, 1999
Field:
Organizational Behavior

Herbert Snyder, Ph.D.
Syracuse University, 1994
Field:
Auditing, Forensic Accounting

Charles D. Stevens, Ph.D.
University of Kansas, 1998
Field:
Human Resource Management

Joseph G. Szmerekovsky, Ph.D.
Case Western Reserve University, 2003
Field:
Operations

Rodney D. Traub, Ph.D.
Purdue University, 1994
Field:
Operations Management

Limin Zhang, Ph.D.
University of Arizona, 2005
Field:
Management Information Systems

Child Development and Family Science

Program and Application Information

Department Head: Dr. James Deal

Graduate Coordinator: Dr. Joel Hektner

Department Location: Evelyn Morrow Lebedeff Hall

Email: **Joel.Hektner@ndsu.edu**

Telephone Number: (701)231-8268

Degree(s) Offered: M.S., Certificate

Application Deadline: February 1 (HDFS, Couple & Family Therapy) Family Financial Planning, Youth Development and Gerontology programs admit students throughout the year.

English Proficiency Requirements

TOEFL ibT 100

IELTS 7

Program Description

The department offers graduate study leading to the Master of Science degree with five options: Human Development and Family Science, Couple and Family Therapy, Family Financial Planning, Youth Development and Gerontology.

The **Human Development and Family Science** option is a two-year program designed to provide students with a research-based, comprehensive, and integrated study of child, adolescent, and family development and dynamics. Faculty emphasize development and interaction throughout the life span and in a broad environmental context, with a particular emphasis on the establishment and maintenance of healthy developmental trajectories.

Faculty

Kristen Benson, Ph.D.
Virginia Polytechnical Institute and State University, 2008
Research Interests:
Gender Identity and Family/Partner Relationships, Diversity Issues in Family Therapy, Collaborative Approaches to Family Therapy Education and Training, and Qualitative Methodology

Elizabeth Blodgett Salafia, Ph.D.
University of Notre Dame, 2008
Research Interests:
Family and Peer Influences on Adolescents' Disordered Eating Attitudes and Behaviors

Sean Brotherson, Ph.D.
Oregon State University, 2000
Research Interests:
Parenting; Family Life Education

Thomas Carlson, Ph.D.
Iowa State University, 2000
Research Interests:
Family Therapy Training & Supervision; Fathering

James E. Deal, Ph.D.
University of Georgia, 1987
Research Interests:
Personality Development in Children; Research Methods

The **Couple and Family Therapy (CFT)** option is a three-year program, accredited by the

Commission on Accreditation in Marriage & Family Therapy Education, designed to train students interested in working in clinical settings as couple and family therapists. This option involves intensive course work and an on-campus practicum the first two years, with thesis work and an off-campus practicum the third year.

The **Family Financial Planning (FFP)** option is a collaborative, inter-institutional program offered through web-based distance education. The FFP option is a 42 credit program with a specific curriculum approved by the Certified Financial Planner (CFP) Board of Standards. The program requires one of the following: practicum, practicum and Master's paper, or a Master's thesis. For students not needing a full Master's degree, a **Graduate Certificate in Family Financial Planning** is also available, with 18 credits of coursework required.

The **Gerontology** option is a collaborative, inter-institutional program offered through web-based distance education. The Gerontology option requires 30 to 33 credits of coursework and a thesis or masters paper for a total of 36 credits. The program can be completed in two to three years. For students not needing a full Master's degree, a **Graduate Certificate in Gerontology** is also available, with 21 credits of coursework required.

The **Youth Development** option is a collaborative, inter-institutional program offered through web-based distance education. The program requires 37 credits, including a Master’s paper or thesis. Students can complete the program in two to three years. Youth development is an emerging professional field. It has a positive orientation, meaning its focus is on promoting the positive development of youth, and

Margaret Fitzgerald, Ph.D.
Iowa State University, 1997
Research Interests:
Birth-timing & Economic Outcomes; The Interface Between Family Business & The Family

Heather Fuller-Iglesias, Ph.D.
University of Michigan, 2009
Research Interests:
Social Support and Family Dynamics Across the Lifespan; Psychosocial Aging; Cultural Contexts

Joel Hektner, Ph.D.
University of Chicago, 1996
Research Interests:
Alcohol/Drug Abuse Prevention; Delinquency; Peer Affiliation Patterns/ Influences on Behavior

Virginia L. Clark Johnson, Ph.D.
Pennsylvania State University, 1984
Research Interests:
Work and Family

Christie McGeorge, Ph.D.
University of Minnesota, 2005
Research Interests:
Family Caregiving; Family Wellness; Premarital Counseling

Debra Pankow, Ph.D.
South Dakota State University, 2002
Research Interests:
Financial Decision-Making; Women's Economic Issues; Youth Financial Literacy

it is an applied field, with professionals who put developmental research and theory into practice in structuring and implementing programs and services for adolescents.

Admissions Requirements

The Department of Child Development and Family Science graduate program is open to qualified graduates of universities and colleges of recognized standing. To be admitted to the program with full status, the applicant must:

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in child or human development, family science, or personal finance, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average in all courses of at least 3.0 or equivalent. Students with a previous graduate degree with a GPA of 3.0 or equivalent may be admitted in full standing.

Students applying for the CFT option must complete the Couple and Family Therapy application. An interview conducted by the CFT faculty to determine readiness for the program will also be required after initial application materials are received. The interview will address professional interests and goals, perceived ability to complete the program, emotional and personal stability, and self-evaluation of clinical skills. Near the end of the first semester after admission, a second interview which focuses on clinical readiness will be conducted prior to admission into the practicum.

Brandy A. Randall, Ph.D.
University of Nebraska-Lincoln, 2002
Research Interests:
Prosocial & Moral Development; Relationships; Positive/Problem Behaviors

Gregory F. Sanders, Ph.D.
University of Georgia, 1983
Research Interests:
Later Life Families; Family Strengths

Cynthia Torges, Ph.D.
University of Michigan, 2006
Research Interests:
Personality development and well-being in middle and late adulthood

Wendy Troop-Gordon, Ph.D. (Adjunct)
University of Illinois, 2002
Research Interests:
Peer Relationships in Childhood; Social-cognitive Development; Psycho-social and School Adjustment

Rebecca Woods, Ph.D.
Texas A&M University, 2006
Research Interests:
Perception and cognition in infancy; object processing; multimodal processing; early gender differences

Financial Assistance

A limited number of assistantships are available to qualified students with priority given to first year students. Graduate assistants work for a faculty member usually for 10 hours per week. The student receives a full waiver of all tuition, as well as a stipend. To be considered for a departmental assistantship, a student must first make application to the Graduate School and be accepted in full or conditional status. The student must then submit a letter to the HDFS department indicating interest and special skills/experiences that would qualify him/her for an assistantship.

Degree Requirements

The HDFS option requires 37-40 semester credit hours; the Couple and Family Therapy option requires 62 credits; the Family Financial Planning option requires 42 credits; the Gerontology option requires 36 credits and the Youth Development options requires 37 credits.

HDFS Option Requirements

HDFS 701 Graduate Orientation Seminar 1
HDFS 703 Research Methods 3
HDFS 781 Family Systems 3
HDFS 782 Advanced Human Development: Birth through Childhood 3
HDFS 784 Advanced Human Development: Adolescence through Early Adulthood 3
HDFS 785 Family Theories 3
HDFS 786 Advanced Human Development: Mid to Late Adulthood 3
Select one course from:
HDFS 705 Quantitative Methods in Developmental Science 3
EDUC 776 Qualitative Research and Program Evaluation 3
SOC 700 Qualitative Methods 3
COMM 708 Advanced Qualitative Methods in Communication 3

HDFS Thesis Option

9 additional credits to be approved by advisor and committee
At least six of these are to be in HDFS and numbered between 700 and 793 (i.e. not practicum, field experience, thesis, or paper credits).
HDFS 798 Master's Thesis 6
37 credits

HDFS Paper option

15 additional credits to be approved by advisor and committee

At least 12 of these are to be in HDFS and numbered between 700 and 793 (i.e. not practicum, field experience, thesis, or paper credits)

HDFS 797 Master's Paper 3

40 credits

CFT Option Requirements:

HDFS 701 Graduate Orientation 1

HDFS 703 Research Methods 3

HDFS 705 Quantitative Methods in Developmental Science 3

HDFS 773 Foundations of Marital & Family Therapy I 3

HDFS 774 Foundations of Marital & Family Therapy II 3

HDFS 775 Clinical Applications in Marital & Family Therapy I 3

HDFS 776 Clinical Applications in Marital & Family Therapy II 3

HDFS 777 Diagnosis & Assessment in Marital & Family Therapy 3

HDFS 790 Special Topics in Clinical Applications 3

HDFS 780 Ethics & Professional Issues in Marital & Family Therapy 3

HDFS 785 Family Theory 3

HDFS 794 Practicum 19

Select 2 from:

HDFS 782 Advanced Human Development: Birth through Childhood 3

HDFS 783 Dynamics of Parent-Child Relations 3

HDFS 784 Advanced Human Development - Adolescence through Early Adulthood 3

HDFS 786 Advanced Human Development: Mid to Late Adulthood 3

CFT Thesis Option

HDFS 798 Master's Thesis 6

Total 62 credits

CFT Paper Option

HDFS 797 Master's Paper 3

Elective 3

Total 62 credits

FFP Option Requirements:

HDFS 781 Family Systems 3

HDFS 764 Family Economics 3

HDFS 677 Financial Counseling 3

HDFS 770 Fundamentals of Family Financial Planning 3

HDFS 771 Investing for the Family's Future 3

HDFS 765 Insurance Planning for Families 3

HDFS 766 Estate Planning for Families 3

HDFS 768 Housing/Real Estate 3

HDFS 762 Retirement Planning, Employee Benefits And the Family 3

HDFS 767 Professional Practices in Family Financial Planning 3

HDFS 763 Personal Income Taxation 3

HDFS 769 Financial Planning - Case Studies 3

During the final year of study, students will have a choice of the following requirements:

Six credits of practicum OR

Three credits of practicum (HDFS 796) and three credits of Master'spaper (HDFS 797)

OR

Six credits of Master's thesis (HDFS 798)

Note: The courses in Insurance, Investment, Personal Taxation, Estate Planning, Retirement and Employee Benefits, and Real Estate and Housing will satisfy the education requirements for students who wish to sit for the Certified Financial Planner exam.

Graduate Certificate in Family Financial Planning Requirements

HDFS 762, 763, 765, 766, 770, and 771. Students completing the certificate ***are eligible to sit*** for the CFP. Certification Examination. The CFP Board website at **http://www.cfp.net** provides information relating to CFP Certification Examination.

Gerontology Option Requirements:

HDFS 790 Perspectives in Gerontology 3

HDFS 660 Adult Development and Aging 3

HDFS 682 Family Dynamics of Aging 3
ADFH 790 Aging and the Environment 3
HDFS 722 Applied Research in Gerontology 3
HNES 652 Nutrition, Health, and Aging 3
HDFS 760 Aging Policy 3
HDFS 790 Professional Seminar in Gerontology 3

During the final year of study, students will have a choice of the following requirements:
A. Six credits of HDFS 798 Master's thesis plus 6 elective credits approved by advisor and committee.
B. Three credits of HDFS 797 Master's paper plus 9 elective credits approved by advisor and committee.

Graduate Certificate in Gerontology Requirements

HDFS 790 Perspectives, HDFS 660, HDFS 722, HNES 652, HDFS 790 Professional, plus two courses from HDFS 760, HDFS 682, or ADFH 790 or from electives approved by advisor and committee.

Youth Development Option Requirements:

HDFS 710 Foundations of Youth Development 1
HDFS 711 Youth Development 3
HDFS 712 Community Youth Development 3
HDFS 713 Adolescents and their families 3
HDFS 714 Contemporary Youth Issues* 3
HDFS 715 Youth in Cultural Contexts 3
HDFS 716 Youth Professionals as Consumers of Research 3
HDFS 717 Program Design, Evaluation, and Implementation 3
HDFS 718 Administration and Program Management 3
HDFS 719 Youth Policy 3
*This course may be taken more than once, as long as the topic areas are different each time.
During the final year of study, students will have a choice of the following requirements:
A. Six credits of HDFS 798 Master's thesis plus 3 elective credits approved by advisor and committee.
B. Three credits of HDFS 797 Master's paper plus 6 elective credits approved by advisor and committee.

Cellular and Molecular Biology

Program and Application Information

Program Coordinator: Dr. Mark Sheridan

Program Location: Stevens Hall

E-mail Address: **ndsu.cmb@ndsu.edu**

Telephone Number: (701) 231-7087

Degree(s) Offered: Ph.D.

Application Deadline: February 15 is the deadline for applicants seeking consideration of financial assistance (fellowship, assistantships) for fall semester and July 1 for spring semester.

Test Requirements

GRE

English Proficiency Requirements

TOEFL iBT 71

IELTS 6

Program Description

The CMB Program offers interdisciplinary research education and training opportunities that lead to a Ph.D. In this setting, students learn to integrate across concepts and to use multiple approaches to study contemporary biological problems. Students have access to state-of-the-art facilities and equipment in faculty laboratories and core facilities around campus. The CMB program prepares students for careers in academia and private industry. All graduates of the program have obtained permanent positions in their field or are engaged in postdoctoral training.

The CMB degree requirements include a series of required CMB core courses; additional elective courses; written and oral preliminary examinations; a doctoral dissertation based on independent, original research in the area of cellular and molecular biology under the direction

Faculty

Marc L. Bauer, Ph.D.
University of Kentucky, 1996
Field: Digestive Physiology, Nutrition
Department: Animal Sciences

Eugene S. Berry, Ph.D.
Northeastern University, 1983
Field: Animal Virology (ss(+) RNA Viruses), Genetic Variation, Mechanisms of Pathogenesis and Virulence
Department: Veterinary and Microbiological Sciences

Peggy R. Biga, Ph.D.
University of Idaho, 2003
Field: Comparative Growth and Nutritional Physiology
Department: Biological Sciences

Julia Bowsher, Ph.D.
Duke University, 2007
Field: Evolutionary Developmental Biology; Molecular Basis of Pattern Formation
Department: Biological Sciences

Sam K. C. Chang, Ph.D.
University Nebraska-Lincoln, 1980
Field: Protein Structure and Function in Foods; Phytochemicals in Legumes; Antioxidant and Anticancer Prolifersation of Bioactive Compounds in Legumes
Department: Cereal and Food Sciences

of a CMB faculty member; and an oral defense of the dissertation.

CMB faculty members are recognized and respected nationally and internationally for contributions to their fields of study. They are drawn from 10 academic departments, including Animal Sciences, Chemistry and Molecular Biology, Biological Sciences, Cereal and Food Sciences, Entomology, Health, Nutrition, and Exercise Sciences, Pharmaceutical Sciences, Plant Pathology, Plant Sciences, and Veterinary and Microbiological Sciences. With the interdisciplinary nature of the program, you can look forward to working closely with not just one but many faculty members at NDSU.

Students may engage in basic and applied aspects of cellular and molecular biology research in various systems, including animals, plants, and microorganisms. Examples of current research by CMB faculty include the following:

- Adaptation to environmental stress
- Assistive reproductive technology
- Apoptosis
- Cancer
- Cell-cell communication
- Cell cycle regulation
- Cell metabolism
- Cytogenetics
- Drug action and metabolism
- Enzymology and metabolic regulation
- Extracellular matrix
- Gene regulation and expression
- Hormone biosynthesis, metabolism, and evolution
- Immunology

Lynn S. Dahleen, Ph.D.
University of Minnesota, 1989
Field: Plant Molecular Genetics and Mapping, Tissue Culture, Transformation
Department: USDA, Plant Sciences

Glenn Dorsam, Ph.D.
Virginia Commonwealth University, 1998
Field: Epigenetic Regulation
Department: Chemistry and Molecular Biology

Michael Edwards, Ph.D. (adjunct)
Cornell University, 1983
Field: Molecular Plant Virology
Department: Plant Pathology

Jeffery E. Gerst, Ph.D.
University of Nebraska, 1973
Field: Animal Physiology and Neurophysiology/Neuroendocrinology
Department: Biological Sciences

Rubella Goswami, Ph.D.
University of Minnesota, 2005
Field: Fungal Genomics; Disease Resistance and Mechanisms of Host-Pathogen Interaction
Department: Plant Pathology

Anna T. Grazul-Bilska, Ph.D.
University of Agriculture and Technology, Poland, 1983
Field: Animal Embryology and Reproductive Physiology & Endocrinology, Assisted Reproduction Technology
Department: Animal and Range Sciences

- Molecular pathogenesis
- Protein structure and function
- Signal transduction
- Stem cells and developmental processes

Admissions Requirements

The Cellular and Molecular Biology Ph.D. program is open to qualified graduates of universities and colleges of recognized standing. If possible, applicants should identify at least one cellular and molecular biology faculty member with whom they wish to study.

The following undergraduate courses have been identified as required for graduate work in the CMB program:

Biology

One year of general biology with laboratory and one course in genetics are required. Cellular biology or cellular physiology, animal or plant physiology, and microbiology are recommended.

Chemistry

One year of general chemistry with laboratory and two sequential terms of organic chemistry with laboratory are required. Biochemistry is recommended.

Mathematics

Two terms of life sciences calculus are required.

Physics

Two sequential terms of general physics with laboratories (above the concept level) are required.

In addition, introductory courses in computer science, statistics,

Kendra Greenlee, Ph.D.
Arizona State University, 2004
Field: Insect Physiology and Immunology, Body Size Effects on Respiration and Metabolism
Department: Biological Sciences

Bin Guo, Ph.D.
State University of New York at Buffalo, 1999
Field: Cancer Cell Biology, Apoptosis, Molecular Pharmacology
Department: Pharmaceutical Sciences

Carrie Hammer, DVM, Ph.D.
Iowa State University, 2003
Field: Equine Physiology, Neonatal Physiology and Immunology
Department: Animal Sciences

Stuart Haring, Ph.D.
University of Iowa, 2004
Field: DNA Metabolism and Cell Cycle Regulation
Department: Chemistry and Molecular Biology

Shahryar Kianian, Ph.D.
University of California-Davis, 1990
Field: Plant Genetics and Genomics; Germplasm Enhancement
Department: Plant Sciences

S. Derek Killilea, Ph.D.
National University of Ireland, Galway, 1972
Field: Metabolic Regulation
Department: Biochemistry and Molecular Biology

and technical writing are recommended. Deficiencies in required courses may be made up within the first year of resident study without graduate credit.

Financial Assistance

Financial support, if required, is usually provided by the department in which the student will carry out research. In reviewing each application, the Steering Committee will contact the faculty member(s) identified by the applicant to determine if financial support is available. Students seeking financial support also can contact either the CMB faculty member(s) with whom they wish to study or the chair of the CMB Steering Committee.

Degree Requirements

By the end of the first academic year, the student will select an academic adviser from among the CMB faculty and arrange for the appointment of a Graduate Advisory Committee. This committee will consist of at least four members of the graduate faculty. This includes the student's major adviser, at least one additional CMB faculty member, and an appointee of the Graduate School. One committee member must be from outside the student's academic college.

The **Plan of Study** will be prepared by the student, in consultation with the major adviser, by the end of the first year in residence. The plan shall be approved by the student's Graduate Advisory Committee, the CMB Program Director, the department chair, the academic dean, and the Graduate School dean. The Plan of Study must be filed in the Graduate School prior to scheduling the comprehensive written examination.

The Graduate School requires the Plan of Study for the Ph.D. degree to include not less than 90 semester graduate credits. Of

Benedict Law, Ph.D.
University of Manchester, UK, 2002
Field: Imaging Diagnostics; Peptide/Protein Delivery
Department: Pharmaceutical Sciences

Catherine M. Logue, Ph.D.
University of Ulster, 1996
Field: Microbiology, Foodborne Pathogens of Production Animals, Pathogenesis, Drug Resistance and Genomics
Department: Veterinary and Microbiological Sciences

Kasey Maddock-Carlin, Ph.D.
Iowa State University, 2005
Field: Meat Science and Muscle Biology
Department: Animal Sciences

Sanku Mallik, Ph.D.
Case Western Reserve University, 1992
Field: Bio-Organic Chemistry, Drug Delivery Using Liposomes and Nanoparticles Department: Pharmaceutical Sciences

Phillip E. McClean, Ph.D.
Colorado State University, 1982
Field: Plant Molecular Genetics
Department: Plant Sciences

John McEvoy, Ph.D.
University of Ulster, 2002
Field: Molecular Epidemiology and Mechanisms of Invasion
Department: Veterinary and Microbiological Sciences

this total, not less than 27 credits must be in courses other than seminar or research credits. Of the 27 course credits, 15 must be at the 700-789 level. The CMB program requires students to complete a series of 7 courses totaling 21-23 semester credits in 4 core areas. The student will complete additional elective courses to fulfill the Graduate School requirement of 27 semester credits in academic courses. An overall GPA of 3.0 or better must be maintained.

Courses Offered

Biochemistry and Molecular Biology (all are required)

Bioc 701, 702 Comprehensive Biochemistry I and II

Bioc 673 Methods of Biochemical Research

Cellular Biology

Bot/Zoo 720 Advanced Cell Biology, required

Biol 722 Current Topics in Cell and Molecular Biology, optional

Molecular Biology

Bioc 674 Methods of Recombinant DNA Technology, required

One of the following is required:

Bioc 719 Molecular Biology of Gene Expression and Regulation

Micr 783 Advanced Bacterial Genetics and Phage

PlSc 731 Plant Molecular Genetics

Technique Courses (one is required)

Bot 680 Plant Tissue Culture

PPth 756 Techniques in Electron Microscopy

PlSc 684 Plant Tissue Culture and Micropropagation

Micr 645 Animal Cell Culture Techniques

Steven W. Meinhardt, Ph.D.
University of Illinois at Urbana-Champaign, 1984
Field: Biochemistry of Plant Interactions, Purification Characterization, and Mode of Action of Fungal Toxins
Department: Plant Pathology

Stephen O'Rourke, Ph.D.
University of Wisconsin, 1995
Field: Vascular Pharmacology/physiology, Regulation of Vasomotor Tone, Smooth Muscle-Endothelial Cell Interactions
Department: Pharmaceutical Sciences

Chung S. Park, Ph.D.
Virginia Polytechnic Institute and State University, 1975
Field: Maternal Nutrition and Epigenetic Control of Mammary Developmental and Mammary Cancer
Department: Animal Sciences

Birgit Pruess, Ph.D.
Ruhr-Universitat Bochum, Germany, 1991
Field: Bacterial Physiology and Global Gene Expression
Department: Veterinary and Microbiological Sciences

Steven Qian, Ph.D.
University of Iowa, 1999
Field: Free Radical Metabolism
Department: Pharmaceutical Sciences

Jack B. Rasmussen, Ph.D.
Michigan State University, 1987
Field: Fungal Disease Interactions, Mode of Action and Role in Disease of Pathogen-Produced Toxins
Department: Plant Pathology

The core courses will normally be completed by the end of the second year in residence. These courses must be completed before the student takes the preliminary written examinations, whereas the elective courses may be taken at any time during the program prior to defense of the dissertation. The elective courses will normally be classes offered by the department in which the student is doing research or other departments participating in the CMB program. Each student is expected to attend all CMB seminars and present at least one seminar per year throughout the program.

Examination

1. Written Preliminary Examination covers the first three core areas (biochemistry and molecular biology, cellular biology, and molecular biology) and is normally taken at the end of the second year in residence. The written preliminary examination must be passed before the comprehensive oral examination can be scheduled.
2. Comprehensive Oral Examination shall be taken no later than the end of the third year in residence. This examination will be based on a non-dissertation research topic that will be submitted in the format of a National Institutes of Health or National Science Foundation postdoctoral fellowship research proposal. After successful completion of the comprehensive oral examination, the student will be formally admitted to candidacy for the Doctor of Philosophy degree. At least one academic semester, and preferably two semesters, shall elapse between the preliminary oral examination and the oral defense of the research-based dissertation.

Dale A. Redmer, Ph.D.
University of Missouri - Columbia, 1983
Field: Animal Physiology, Reproductive Physiology, Fetal Growth, Placental Function, Ovarian Function, Vascular Growth
Department: Animal Sciences

Katie Reindl, Ph.D.
North Dakota State University, 2006
Field: Cancer Cell Biology, Cell Migration and Metastasis, Cell Cycle Control, Extracellular Matrix Interactions
Department: Biological Sciences

Lawrence P. Reynolds, Ph.D.
Iowa State University, 1983
Field: Factors Influencing Fetal and Placental Growth and Development in Compromised Pregnancies
Department: Animal Sciences & Center for Nutrition and Pregnancy

Jane Schuh, Ph.D.
North Dakota State University, 2002
Field: Immunology of Chronic Airway Remodeling, Cellular Differentiation in Pulmonary Disease, Animal Modeling of Allergic Airway Disease (Asthma)
Department: Veterinary and Microbiological Sciences

Jonathan Sheng, Ph.D.
State University of New York at Albany, 1998
Field: Drug Metabolism, Molecular Pharmacology/Toxicology
Department: Pharmaceutical Sciences

Mark A. Sheridan, Ph.D.
University of California-Berkeley, 1985
Field: Control of Growth, Development, and Metabolism
Department: Biological Sciences

Dissertation Research

A short proposal describing research suitable for preparation of a dissertation in Cellular and Molecular Biology shall be prepared and submitted to the student's Graduate Advisory Committee and the CMB Steering Committee for review and approval. The dissertation must show originality and demonstrate the student's capacity for independent research. It must embody results of research that constitutes a definitive contribution to knowledge.

In addition to the defense of the dissertation in the final oral examination, the candidate will present a final public seminar based on the dissertation research.

Program Administration

This interdisciplinary graduate program is administered by the CMB Steering Committee. The committee is composed of five CMB faculty members representing five different academic departments. Steering Committee members, who serve overlapping three-year terms, are elected at a yearly meeting of the CMB faculty. A committee chair/program director is elected annually by the committee.

The duties of the Steering Committee include 1) review of each CMB student's plan of study, proposed research topic, and general progress; 2) review of applications for membership in the CMB faculty; and 3) implementation of the CMB program by established procedures.

Jagdish Singh, Ph.D.
Banaras Hindu University, 1982
Field: Novel Drug Delivery Systems for Protein, Vaccine and Gene
Department: Pharmaceutical Sciences

Sangita Sinha, Ph.D.
Purdue University, 2000
Field: Structure Biology and Biochemistry of host pathogen interactions Department: Chemistry, Biochemistry and Molecular Biology

D. K. Srivastava, Ph.D.
Banaras Hindu University, India, 1980
Field: Enzyme Mechanisms and Regulation
Department: Biochemistry and Molecular Biology

Chengwen Sun, Ph.D.
Jilin University, China, 2000
Field: Blood Pressure Regulation; Cell Signaling
Department: Pharmaceutical Sciences

Kimberly Vonnahme, Ph.D.
University of Wyoming, 2003
Field: Reproductive Physiology, Fetal and Placental Growth
Department: Animal Sciences; Center for Nutrition and Pregnancy

Erxi Wu, Ph.D.
Sheffield University, UK, 1998
Field: Pharmacogenomics; Tumor Therapeutic Targets; Drug Discovery; Anticancer Natural Products
Department: Pharmaceutical Sciences

Cereal Sciences

Program and Application Information

Program Chair: Dr. Deland Myers
Department Location: Harris Hall
Telephone Number: (701) 231-7713
Degree(s) Offered: Ph.D., M.S.
Application Deadline: March 15 for entry in Summer or Fall semesters and September 30 for entry in Spring semester, but applications are accepted year-round.

English Proficiency Requirements

TOEFL iBT 71
IELTS 6

Program Description

The School of Food Systems offers graduate study leading to the M.S. and Ph.D. degrees in Cereal Sciences. Advanced work may involve research in the areas of proteins, carbohydrates, enzymes, and lipids of cereals, legumes, and other northern-grown crops; barley malting and brewing; wheat milling, baking, and pasta processing. Research in functional foods and stability of bioactive compounds in food systems are also predominant areas of research.

The department has a close working relationship with the Northern Crops Institute and the USDA Hard Red Spring and Durum Wheat Quality Laboratory housed in the Harris Hall complex.

Students are strongly urged to visit faculty members to discuss research opportunities. During the first year in the program, the student will, with his or her adviser, prepare a research proposal.

Faculty

Deland Myers, Ph.D., Chair
Iowa State University, 1984
Research Interests:
Utilization of Legume and Cereal Proteins in Nonfood and Food Applications and Their Functionality.

Kow Ching (Sam)Chang, Ph.D.
University of Nebraska-Lincoln, 1980
Research Interests:
Legumes, Processing and Chemistry

Douglas C. Doehlert, Ph.D. (associate)
University of Wisconsin, 1982
Research Interests:
Oat Variety Development, Quality of Oats and Oat Products

Clifford A. Hall III, Ph.D.
University of Nebraska-Lincoln, 1996
Research Interests:
Flaxseed, Antioxidants, Phytochemical Stability in Food Systems

Gary A. Hareland, Ph.D. (associate)
North Dakota State University, 1987
Research Interests:
Durum and Hard Red Spring Wheat Quality

Khalil Khan, Ph.D.
University of Manitoba, 1977
Research Interests:
Electrophoresis, Proteins and Enzymes, Wheat Quality

Admissions Requirements

The Cereal Sciences graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full standing status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institute of recognized standing.
2. Have adequate preparation in biochemistry/chemistry and the biological sciences, including microbiology, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show satisfactory potential for graduate study may be admitted conditionally. Dependent upon the student's academic performance after the first or second semester of study, the conditional status may be changed to full graduate standing.

Financial Assistance

The number of assistantships varies from year to year, depending on industrial support, grants, and the number of students in residence. Applicants are considered on the basis of scholarship, academic performance, and financial need. The application to the Graduate School, including the three letters of reference and official transcripts, is required to be considered for an assistantship. International students must also submit a TOEFL score. The minimum annual stipends for M.S. and Ph.D. students are $12,000 and $13,200, respectively, for a half-time assistantship. Assistantship stipends may be increased as the student progresses through their program after achieving milestones such

Frank Manthey, Ph.D.
North Dakota State University, 1985
Research Interests:
Durum Wheat Quality, Pasta/Noodle Processing, Carotenoid Deposition in durum wheat

Jae Ohm, Ph.D. (associate)
Kansas State University, 1996
Research Interests: Cereal Chemistry

Paul B. Schwarz, Ph.D.
North Dakota State University, 1987
Research Interests:
Malting Barley Quality

Senay Simsek, Ph.D.
Purdue University, 2006
Research Interests:
Wheat Quality and Carbohydrate Research

Dennis P. Wiesenborn, Ph.D.
Rice University, 1988
Research Interests:
Food Engineering, Process Development, Oilseeds Processing

Charlene Wolf-Hall, Ph.D.
University of Nebraska-Lincoln, 1995
Research Interests:
Food Microbiology and Food Safety

as proposal defense, preliminary exam completion, etc.) In addition, graduate tuition is waived for students with assistantships.

Degree Requirements

The Master of Science program requires a minimum of 20 semester credits of course work with an overall GPA of 3.0 or better. The Ph.D. program requires the completion of a minimum of 40 semester credits of course work with an overall GPA of 3.0 or better.

With assistance from the adviser, a supervisory/advisory and examining committee is established and a plan of study developed. The student is required to prepare and defend a written research proposal.

For M.S. candidates, a written examination on course work is required prior to scheduling the final oral examination at which the student defends the thesis and is asked questions covering academic subject matter.

Ph.D. candidates are required to take a preliminary written and oral examination covering academic subject matter and a final oral defense of a research-based dissertation.

Research Facilities and Equipment

The department maintains specialized equipment that evaluates cereal and food quality including laboratory equipment, such as spectrophotometers, gas chromatographs, a particle size analyzer, LC-MS, GC-MS, high-performance liquid chromatographs, various electrophoretic devices, a differential scanning calorimeter, Rapid ViscoAnalyzer, and computer terminals. Flour mills, ranging up to pilot-plant size; three completely equipped bake shops; continuous bread-baking equipment; rheological instruments for dough testing; several pasta-processing units; malting equipment; Asian noodle making equipment; soymilk/tofu processing machines; a wet processing pilot plant; labscale HT/ST extruder; and a microbrewery are some examples of the specialized equipment.

In addition, the department has access to equipment and instrumentation in the Northern Crops Institute and USDA Hard Red Spring and Durum Wheat Quality Laboratory housed in the same building complex.

Chemistry

Program and Application Information

Department Chair: Dr. Greg Cook

Department Location: Ladd Hall

E-mail Address: **NDSU.chemistry@ndsu.edu**

Telephone Number: (701)231-8694

Degree(s) Offered: Ph.D., M.S.

Application Deadline: May 1

Test Requirements

GRE (general required; subject recommended)

English Proficiency Requirements

TOEFL ibT 81 (23 speak; 21 write) – TA; 71 – RA

IELTS 6.5 – TA; 6 – RA

Program Description

The Department of Chemistry and Molecular Biology offers programs leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degree in Chemistry. At the start of the first year of study, entering graduate students take entrance examinations in analytical, inorganic, organic, and physical chemistry , as well as biochemistry and molecular biology. The graduate student progress committee uses these exams for advisory purposes in recommending course work during the first year. As a consequence, programs are individually tailored to the needs of each student. Typically, coursework is completed in one to one-and-a-half years for M.S. candidates, and two years for Ph.D. candidates, leaving later years for full-time thesis research. The typical time to complete a graduate degree averages three years for the M.S. degree and approximately five years for the Ph.D.

Faculty

Gregory R. Cook, Ph.D.
Michigan State University, 1993; Postdoctoral, Stanford University, 1994-1996
Research Area:
Synthetic Organic Chemistry

Uwe Burghaus, Ph.D.
Free University of Berlin, 1995; Postdoctoral, University of Genoa, Italy, 1995-1997
Research Area:
Surface Physical Chemistry

John F. Hershberger, Ph.D.
Yale University, 1986; Postdoctoral, Columbia University, 1986-1989
Research Area:
Experimental Physical Chemistry, Laser Kinetics

Denley Jacobson, Ph.D.
Purdue University, 1984; Postdoctoral, California Institute of Technology, 1984-1986
Research Area:
Gas Phase Ion Chemistry

John F. Hershberger, Ph.D.
Yale University, 1986; Postdoctoral, Columbia University, 1986-1989
Research Area:
Experimental Physical Chemistry, Laser Kinetics

Denley Jacobson, Ph.D.
Purdue University, 1984; Postdoctoral, California Institute of Technology, 1984-1986
Research Area:
Gas Phase Ion Chemistry

Admissions Requirements

The graduate programs in Chemistry are open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in chemistry and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent. Students with a previous graduate degree with a GPA of at least 3.0 or equivalent may be admitted in full standing.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show potential for successful graduate study may be admitted under a conditional status. Evidence must be provided showing that the applicant's potential is not adequately reflected by his/her record. After meeting the specified standards of performance by the department, the student in consultation with the major adviser may request a change to full graduate standing. The student may not earn more than 12 semester hours of graduate credit in the conditional status. The request for change must be submitted to the Dean of the Graduate School by the major adviser and approved by the department chair.

Financial Assistance

The student must first apply to the Graduate School and be accepted in full or conditional status before he/she is eligible for an assistantship in the Department of Chemistry and Molecular

Sivaguru Jayaraman, Ph.D.
Tulane University, 2003; Postdoctoral, Columbia University, 2003-2006
Research Area:
Supramolecular Chemistry, Molecular Recognition, and Photoscience

M. Erkan Kose, Ph.D.
University of Florida, 2005; Postdoctoral, Clemson University, 2005-2006; National Renewable Energy Laboratory, 2006-2009
Research Area:
Materials Chemistry and Photochemistry

Guodong Liu , Ph.D.
Hunan University, 2001; Postdoctoral, New Mexico State University, 2002-2004; Postdoctoral, Pacific Northwest National Laboratory, 2004-2006
Research Area:
Nanotechnology and Biological Sensing

Seth C. Rasmussen, Ph.D.
Clemson University, 1994; Postdoctoral, University of Oregon, 1995-1999
Research Area:
Inorganic/Organic Materials Chemistry, Chemical History

Kenton R. Rodgers, Ph.D.
University of Iowa, 1988; Postdoctoral, Princeton University, 1989-1993
Research Area:
Inorganic and Bioinorganic Chemistry

Mukund P. Sibi, Ph.D.
City University of New York, 1980; Postdoctoral, Dartmouth College, 1980-1982; Postdoctoral, University of Waterloo, 1982-1985
Research Area:
Synthetic Organic Chemistry; Natural Products

Biology.

Graduate students in the Department of Chemistry and Molecular Biology are supported during both the academic year and during summer months by either teaching assistantships (TA) or research assistantships (RA). As of the 2009-2010 academic year, the standard monthly stipend is $1,683 per month for RAs and $1,750 per month for TAs. Graduate tuition (except for a student activity fee) is waived for all TAs and RAs in good academic standing.

Degree Requirements

The Master of Science program requires the completion of a total of 30 graduate semester credits with an overall GPA of 3.0 or better. This total is comprised of both class work and research credit, but must consist of at least 16 semester credits from letter-graded course work. The Ph.D. program requires the completion of a total of 90 graduate semester credits with an overall GPA of 3.0 or better. This total is comprised of both class work and research credit, but must consist of at least 27 semester credits from letter-graded course work.
Each student chooses a thesis adviser within six months of beginning graduate school. As this is one of the most important decisions made in graduate school, students are strongly urged to visit multiple faculty members to discuss research opportunities. In addition, faculty seminars during the fall semester are designed to acquaint new students with the available research programs.

By the end of the first academic year, each student selects an advisory and examination committee, which consists of the thesis adviser, two other faculty members in the chemistry department, and one faculty member from a department outside the department of Chemistry and Molecular Biology.

Wenfang Sun, Ph.D.
Institute of Photographic Chemistry, Chinese Academy of Sciences, 1995; Postdoctoral, University of Alabama, Birmingham, 1997-1999
Research Area:
Organic Materials Chemistry

Pinjing Zhao, Ph.D.
Cornell University, 2003; Postdoctoral, Yale University, 2004-2006; Postdoctoral, University of Illinois at Urbana-Champaign, 2006-2007 Research Area:
Inorganic and Organometallic Chemistry

Admission to candidacy for the Ph.D. degree is accomplished by satisfying three requirements: 1) satisfactory performance in course work with a minimum 3.0 grade-point average, 2) satisfactory performance in comprehensive examinations taken by the end of the 4th semester, and 3) satisfactory defense of an original research proposal on a topic approved by the student's advisory committee. The defense of this proposal must occur at least eight months prior to the final oral examination. Following completion of dissertation research, the candidate must complete a written dissertation and an oral presentation to the department and advisory committee.

Research Opportunities and Infrastructure

The Department of Chemistry and Molecular Biology has more than 10 externally funded faculty research programs. Research expenditures have averaged $1.8 million over the last 10 years, with more than $2.2 million in the last 2 years.

All research and most teaching activities within the department occur within three centrally-located buildings, including two connected facilities, Ladd Hall and Dunbar Laboratory, as well as the Industrial and Agricultural Communications Center (IACC) located across the street. Most departmental offices, classrooms and teaching labs as well as some research labs are located in Ladd Hall, while Dunbar and the third floor of the IACC primarily consists of research laboratories. Ladd Hall also houses departmental glass, machine, and electronics shops. Modern instrumentation is vital to research in the chemical sciences. The quality and quantity of instrumentation within the department has been greatly enhanced in the last few years through aggressive fund-raising efforts and university matching support.
The department has recently upgraded its mass spectrometry capabilities to include a Bio-TOF III with accurate mass analysis, ESI and CI ionization; as well as an Esquire 3000 Plus - an Ion trap instrument with MS-MS and proteomics capabilities. A dedicated LC can be integrated with the both the instruments.

The Organic Spectroscopy Laboratory is primarily devoted to maintenance and operation of Nuclear Magnetic Resonance (NMR) spectrometers. The facility includes three modern high-field instruments: Varian 500, 400, and 300 MHz spectrometers. All have multinuclear, 2-D, and variable temperature capabilities, and the 400 MHz instrument has been recently upgraded for solids capabilities. This center also includes the departmental FTIR.

The Materials Characterization Laboratory houses the departmental crystallography faculties including a Bruker single crystal CCD X-ray diffractometer with low temperature capabilities, a Philips MPD (Multi-Purpose Diffractometer), two Philips X-ray powder diffractometers, and a Kevex X-ray fluorescence unit. CHN Elemental analysis, thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), and differential thermal analysis (DTA) are also available.

The Center for Protease Research - Core Biology Facility is a new facility housing equipment and technical personnel for performing bioassay, cell and tissue culture, and molecular biology experiments. For bioassays, the facility has a fluorimeter capable of top or bottom reading and the capability to handle both 96- and 384-well plates. For sample preparation, researchers can utilize cell and tissue culture capabilities such as flow hoods and culture chambers. In addition, RT-PCR and FPLC protein purification technology is available.

The chemistry library, located in Ladd Hall, provides graduate students and faculty with convenient 24-hour access to more than 200 journals and approximately 10,000 volumes. Literature searching via SciFinder is supported.

Prospective students are encouraged to visit the Department of Chemistry and Molecular Biology Web site (**http://www.ndsu.edu/chemistry/)**for the latest descriptions of research programs and instrumentation.

Civil Engineering

Program and Application Information

Department Chair: Dr. Eakalak Khan

Department Location: 201 Civil and Industrial Engineering Building

Telephone Number: (701)231-7244

Fax Number: (701)231-6185

Degree(s) Offered: Ph.D., M.S.

Application Deadline: January 5 for fall; May 20 for spring

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Civil Engineering offers the M.S. and Ph.D. degrees in civil engineering and the M.S. degree in environmental engineering. Also, the College of Engineering and Architecture offers a program leading to a Ph.D. degree in engineering in which civil engineering is a possible area of specialization. The M.S. in environmental engineering and the Ph.D. in engineering programs are described in their respective sections. The department also participates in several interdisciplinary programs such as Environmental and Conservation Sciences, Materials & Nanotechnology and Transportation and Logistics.

Specialty areas in the M.S. and Ph.D. degrees in civil engineering include construction, environmental, geotechnical, materials, structural, transportation, and water resources engineering. Other related areas are also accommodated. The academic and research foci are tailored to individual needs and interests. To complement the major area of study, additional courses are often selected from other disciplines. The programs

Graduate Faculty

Magdy Abdelrahman, Ph.D.
University of Illinois-Urbana, 1996
Research Interests:
Characterization of Modified Asphalt Binders and Mixes, Pavement, Maintenance and Rehabilitation Techniques, Performance-Related, Specifications for Pavement Materials, Quality Control and Quality, Assurance in Pavement Construction.

Donald A. Andersen, Eng.D.
Texas A & M University, 1982
Research Interests:
Transportation, Pavements, Traffic Engineering

Eric Asa, Ph.D.
University of Alberta, 2002
Research Interests: Infrastructure and Assets Management, Construction Materials, Engineering Education, Computational Modeling

Achintya N. Bezbaruah, Ph.D.
University of Nebraska-Lincoln (UNL), 2002
Research Interests:
Environmental sensors, Recalcitrant and micro pollutants, Contaminant fate and transport, Small community water and wastewater treatment, Environmental management

are designed to advance the technical knowledge, competence, and interdisciplinary understanding of the students and to prepare them for entering or advancing within the civil engineering profession.

Admissions Requirements

To be admitted to the M.S. or Ph.D. programs in civil engineering, the applicant must:

Master of Science

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in civil engineering, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) of at least 3.0 or equivalent to attain full standing.
4. For international applicants, a minimum TOEFL score of 71 (internet-based test) or 5.5 IELTS is required for admission.

Doctor of Philosophy

1. Hold a baccalaureate degree or preferably a master's degree in civil engineering from an educational institution of recognized standing with a cumulative grade point average of at least 3.0 or equivalent at both the baccalaureate and master's levels.
2. Have adequate preparation in civil engineering, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. For international applicants, a minimum TOEFL score of 71 (internet-based test) or 5.5 IELTS is required for admission.

Xuefeng (Michael) Chu, Ph. D.
University of California, Davis, 2002
Research Interests:
Watershed Hydrologic and Environmental Modeling, Overland Flow and Infiltration, Integrated Modeling of Flow and Contaminant Transport

S. Gajan, Ph.D.
University of California, Davis, 2006
Research Interests:
Geotechnical Engineering, Earthquake Engineering, Dynamic Soil - Structure Interaction

Zhili (Jerry) Gao, Ph.D.
Iowa State Univerisity, 2004
Research Interests:
Design and Construction Visualization, BIM, Concrete Materials and Construction, Bridge Engineering

Zhi Ge, Ph.D.
Iowa State University, 2005
Research Interests:
Portland Cement Concrete Pavements, Sustainable Concrete Materials, Properties and Testing of Concrete Structures, Concrete Microstructure

Chung-Souk Han, Ph.D.
University of Hannover, Germany, 1999
Research Interests:
Computational mechanics and simulation techniques, Crystal plasticity and composite materials, Micromechanical characterization/modeling at the micron and nanometer scale, Mechanics of polymers, Macroscopic modeling of anisotropic materials

Financial Assistance

Research and/or teaching assistantships may be available. Applicants are considered on the basis of scholarship, potential to undertake advanced study and research, and financial need. To be considered for an assistantship, a completed Graduate School application, official transcripts, and three letters of reference (and TOEFL results for international applicants) must be submitted to the Graduate School.

For teaching assistantships, TOEFL and additional requirements for eligibility can be found on the Graduate School webpage.

Degree Requirements

The Master of Science degree is offered in the thesis format. This format emphasizes research, and the ability to analyze and interpret data and to prepare a scholarly thesis. The student and adviser develop a program of study consisting of at least 30 credit hours of graduate level material to meet individual educational goals. An overall GPA of 3.0 or better must be maintained. An oral defense of the research-based thesis is required.

The Doctor of Philosophy degree requires a total of 90 credits beyond the baccalaureate degree in civil engineering with an overall GPA of 3.0 or higher (60 credits beyond an M.S. degree in Civil Engineering or a sub-area of Civil Engineering) for graduation. A dissertation advisory committee should be formed and a plan of study filed by the end of first year after admission. A minimum of 30 hours of additional course work chosen by the student and his/her advisory committee from appropriate existing Civil Engineering graduate courses, new courses, and courses outside the department must be completed.

Dinesh Katti, Ph.D.
University of Arizona, 1991
Research Interests:
Geotechnical Engineering, Constitutive Modeling of Geologic Materials, Expansive Soils, Multiscale Modeling, Steered Molecular Dynamics, Computational Mechanics, Nanocomposite, and Bio-nanocomposites. Computational Biophysics

Kalpana Katti, Ph.D.
(Graduate Coordinator)
University of Washington, 1996
Research Interests:
Advanced Composites, Nanomaterials, Biomaterials, Biomimetics, Materials Characterization and Modeling, Analytical Electron Microscopy, and Microspectroscopy, Bone Tissue engineering

Eakalak Khan, Ph.D.
University of California, Los Angeles, 1997
Research Interests:
Water and Wastewater Quality, Water and Wastewater Treatment, and Storm Water and Non-point Source Pollution

Yail "Jimmy" Kim, Ph.D.
Queen's University, 2006
Research Interests:
Structure Rehabilitation, Concrete Structures, Bridge Engineering

Wei Lin, Ph.D.
SUNY at Buffalo, 1992
Research Interests:
Water and Wastewater Treatment, Hazardous Waste Management

An M.S. degree from another institution may substitute for up to 30 credits of the 90 credits required; however, suitability of transfer or use of courses and research credits in the plan of study would be decided by the adviser and advisory committee.

A comprehensive preliminary exam is administered after completion of the greater portion of the course work. The committee chair will coordinate the examination. The format and duration will be determined by the committee. The student will present a research proposal within one year after the preliminary examination. A minimum of 30 and a maximum of 40 credit hours can be earned for research, preparation, and defense of a dissertation in Civil Engineering. A minimum of 12 credit hours in a minor or cognate area as deemed appropriate by the student and the advisory committee may be completed by the student. The student will defend his/her dissertation in a final examination attended by the advisory committee members and other academics.

Charles McIntyre, Ph.D. (Graduate Program Director)
Pennsylvania State University, 1996
Research Interests:
Engineering & Construction Education, Project Scheduling & Control, Land Development, Design Support Systems

G. Padmanabhan, Ph.D.
Purdue University, 1980
Research Interests:
Stochastic Hydrology, Water Resource Systems, and Hydrologic Modeling

Mohamed Saafi, PH.D.
University of Alabama, 2001
Research Interests:
Concrete, Nano-technology, Composites

Darshi De Saram, Ph.D.
The Hong Kong Polytechnic University, 2002
Research Interests:
Construction Coordination, Managing for Quality and Safety, Organization Dynamics and Culture, Professional Education

Gary R. Smith, Ph.D.
Purdue University, 1986
Research Interests:
Quality Control and Systems Applications, Decision Analysis and Modeling Techniques, Safety Performance Measurement and Improvements in Labor Productivity

Jongchul Song, Ph.D.
The University of Texas at Austin, 2005
Research Interests:
Information and Sensing Technology Applications in Construction and Transportation, Modular Construction, Asphalt Pavement Construction, and Maintenance

Amiy Varma, Ph.D.
Purdue University, 1993
Research Interests:
Transportation Systems and Planning, Traffic Engineering, Airports, and Infrastructure Management

J.K . (Janet) Yates, Ph.D.
Texas A&M University, 1986
Research Interests:
Global Engineering and Construction, Sustainable Industrial Construction, Construction Contracts and Law, Productivity Improvement, and Construction Failures

Frank Yazdani, Ph.D.
University of New Mexico, 1987
Research Interests:
Structures, Constitutive Modeling of Materials, and Continuum Mechanics

Denver D. Tolliver, Ph.D. (adjunct)
Virginia Polytechnic University, 1989
Research Interests:
Transportation, Planning and Economics

Robert Zimmerman, Ph.D. (adjunct)
North Dakota State University, 1991
Research Interests: Water and Wastewater Treatment, Solid Waste

Coatings and Polymeric Materials

Program and Application Information

Department Chair: Dr. Stuart Croll

Graduate Coordinator: Dr. Dean Webster

Department Location: Research I, Research Park

Email: **Dean.Webster@ndsu.edu**

Telephone Number: (701)231-7633

Degree(s) Offered: Ph.D., M.S.

Application Deadline: April 15

Test Requirements

GRE (required for international applicants, recommended for all applicants)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Department of Coatings and Polymeric Materials offers graduate studies leading to the M.S. and Ph.D. degrees in polymers and coatings science and students in the department may also get a Ph.D. in the Materials Science and Nanotechnology program. The departmental research bridges between basic and applied research in the field of polymers and coatings. There is a unique atmosphere and opportunities for cross-disciplinary research experience, often accomplished by multi-disciplinary research activities with, for example, chemistry or engineering departments. Advanced research work involves specialized training in the following areas: colloidal and interfacial chemistry of polymers and coatings, polymer synthesis, adhesion, durability, spectroscopy, corrosion, electrochemistry, nanomaterials design and synthesis, and rheology. The department has an industrial advisory board consisting of leading industrial

Faculty

Gordon P. Bierwagen, Ph.D.
Ph.D. Iowa State University, 1968
Research Interests:
Surface chemistry of coatings materials, corrosion, electrochemistry of coatings, coating lifetime prediction, concentrated random composites

Bret Chisholm, Ph.D.
Ph.D. University of Southern Mississippi, 1993
Research Interests:
Combinatorial chemistry methods for coatings, novel organic-inorganic coatings applications, new polyester nanocomposites

Stuart G. Croll, Ph.D.
Ph.D. University of Leeds, UK, 1974
Postdoctoral: National Research Council, Canada
Research Interests:
Weathering durability of coatings, service lifetime prediction, colloidal stability, physical chemistry and suspension stability, pigment-polymer interactions, film formation processes, coating and polymer physics, art conservation.

Eric Hobbie, Ph.D.
Ph.D. University of Minnesota, 1990
Research Interests: Nanotechology, Nanparticles, Polymers, Optics and Rheology

scientists and/or former graduates who provide new directions and other feedback to the program.

First-year students who enter the program may take entrance examinations, which are used by the graduate committee primarily for advisory purposes. During the fall semester, the faculty meet with the new students to acquaint them with the research programs in the department. Because students are required to team with a research adviser by the end of the first semester in residence, they are required to discuss research opportunities with all faculty members.

Admissions Requirements

The Department of Coatings and Polymeric Materials graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must:

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in a science or engineering, field, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent. Students with a previous graduate degree with a GPA of 3.0 or equivalent may be admitted in full standing.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show potential for successful graduate study, may be admitted with conditional status but evidence must be provided showing that the applicant's record does not adequately reflect his/her potential. The student may not

Victoria Johnston Gelling, Ph.D.
Ph.D. North Dakota State University, 2001
Research Interests:
Corrosion control of active metal substrates by environmentally friendly coatings, electroactive conducting polymers (ECPs) as corrosion inhibitors, electrochemical experimental techniques for the examination of coated substrates

Andrej Voronov, Ph.D.
Ph.D. Lviv Polytechnic Institute, Ukraine, 1994
Research Interests:
Synthesis of amphiphilic, invertible polymers with controllable hydrophilic-lipophilic properties. Polymer invertibility in polar and non-polar media; phase transfer and micelle formation, size- and shape-controlled synthesis of nanoparticles

Dean Webster, Ph.D.
Ph.D. Virginia Polytechnic Institute and State University, 1984
Research Interests:
Synthesis of high performance polymers, polymerization reactions, crosslinking chemistry, and quantitative structure-property relationship

Research Faculty

Kerry Allahar
Ph.D. University of Florida, 2003
Research Interests:
Modeling and Prediction of Corrosion in Coated Metal Systems, Diffusion, Percolation and General Mass Transport, Electrochemical analysis of lubricating systems via Electrochemical Impedance Spectroscopy (EIS)

earn more than 12-semester graduate credits in the conditional status. After meeting the specified standards of performance set by the department, the student, in consultation with the major adviser, may request a change to full graduate standing. The request for change must be submitted to the Dean of the Graduate School by the adviser and approved by the departmental graduate program director or chair.

Financial Assistance

The student must first be accepted in full or conditional status before he/she is eligible for an assistantship in the Department of Coatings and Polymeric Materials. To be considered for an assistantship, a completed Graduate School application, official transcripts, and three letters of reference must be submitted no later than April 15. International students must also submit a TOEFL score. General and subject GRE scores are highly encouraged if they are available to the student. Graduate students are supported during both the academic year and summer months by either teaching or research assistantships. The current monthly stipend is $1,300 - $1,700+ per month, for an annual stipend of $15,600 - $20,400+. University tuition is waived for all qualified TA's and RA's.

Degree Requirements

The Master of Science programs require the completion of 16 credits of letter-graded course work with an overall GPA of 3.0 or better. The Ph.D. option requires the completion of 27 credits of letter-graded course work with an overall GPA of 3.0 or better. Each student must choose a thesis (research) adviser within three to six months of beginning graduate school (see above). After two semesters, the student must also select an examining committee. This committee advises the student and administers oral examinations. Candidates for the M.S. program normally

Brian R. Hinderliter
Ph.D. University of Virginia, 2000
Research Interests:
Radiation Transport, Monte Carlo Simulations of Polymer Degradation, Prediction of Coating Properties, Finite Element Modeling of Polymer Mechanics, Percolation and General Mass Transport, Electromagnetic and Dielectric Response of Coatings

Dennis E. Tallman
(formerly of NDSU Dept. of Chemistry)
Ph.D. The Ohio State University, 1968
Research Interests:
Analytical and Physical Electrochemistry, Corrosion Mechanisms, Corrosion Control by Coatings, Electroactive Conducting Polymers, Scanning Probe Techniques Microelectrodes and Microelectrode Arrays

Adjunct Faculty

Dante Battocchi, (Center for Surface Protection, NDSU)
D. Eng. University of Trento, 2001
Research Interests:
Electrochemical Noise Measurements, Scanning Vibrating Electrode Technique (SVET), Organic metal-rich primers characterization and development, Materials protection and metal corrosion

Bret Chisholm, (Center for Nanoscale Science and Engineering, NDSU)
Ph.D. University of Southern Mississippi, 1993
Research Interests:
Combinatorial chemistry methods for coatings, novel organic-inorganic coatings applications, new polyester nanocomposites

satisfy course requirements within one year of study. Ph.D. candidates typically take about two years to complete courses, leaving later years for full-time dissertation research.

Candidacy qualifying examinations are administered twice annually. All Ph.D. candidates are required to pass the qualifying exam and defend an original written research proposal at least eight months prior to the final dissertation examination. The proposal topic must be approved by the student's research advisor and the committee administers an oral exam. Lastly, following completion of dissertation research and the presentation of an acceptable written dissertation, the candidate defends it before the advisory committee.

Research Facilities and Equipment

The Department of Coatings and Polymeric Materials is housed in a new building in the NDSU Research and Technology Park on the northwest corner of the campus. This new building consists of nearly 40,000 square feet of floor space for research and teaching. The holdings in the Klosterman Chemistry Library (second floor of Ladd Hall) include current subscriptions to more than 200 journals, monographs, and other reference materials. Graduate students and faculty have round-the-clock access seven days a week.

Modern equipment and instrumentation have profoundly influenced the development of instruction and are the cornerstones of research in the chemical sciences. The Department of Coatings and Polymeric Materials possesses extensive instrumentation to characterize polymers and colloids ranging from the most modern spectrometers, advanced electrochemical equipment and atomic force microscopes to paint making and testing equipment. Other modern research facilities, for example, state-of-the-art electron microscopy, high-performance computing and N.M.R. laboratories, are readily available to all researchers on the NDSU campus and in the NDSU technology park.

Matthew S. Gebhard
(currently at Valspar Corp.)
Ph.D. Stanford University, 1990
Research Interests:
Rheology in coatings processes, final film properties, architectural binder technology

Loren W. Hill, Ph.D. (Consultant)
Ph.D. Pennsylvania State University, 1965
Research Interests:
Structure-property relationships of thermoset coatings, dynamic mechanical analysis

Theodore Provder, Ph.D. (Consultant)
Ph.D. University of Wisconsin, 1965
Research Interests:
Chromatographic and separation methods of polymers, particle size measurements

Richard R. Roesler, Ph.D. (Consultant)
Ph.D. University of Washington, 1969
Research Interests:
Blocked polyisocyanates, polyurethane pispersions, high solids amine functional coreactants for polyisocyanate

Brian S. Skerry, Ph.D.
(currently at Sherwin-Williams)
Ph.D. University of Manchester, UK, 1980
Research Interests:
Corrosion and coatings

College Teaching Certificate

Program and Application Information

Program Director: Dr. Donald P. Schwert
Program Location: Center for Science & Mathematics Education, FLC 314E
Email: **Donald.Schwert@ndsu.edu**
Telephone Number: (701)231-7436
Degree(s) Offered: Certificate

Program Description:

Enrollment in the College Teaching Certificate (CTC) provides a structured program in pedagogy for graduate students across campus who plan to teach in a college or university. Students study contemporary education research focused on higher education issues, as well as gain experience in the teaching and learning process through microteaching modules, field experience, peer observations, and a structured practicum.

The program consists of 9 SH.

Students enrolled in the CTC program must be concurrently enrolled in a graduate program leading to a degree. Prior to enrollment in the CTC program, students are advised to consult with the chair of their home department and then with the CTC program director to assure that completion of the Field Experience (795) requirement will be possible.

Admissions Requirements:

To be admitted to the program, the applicant must:

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 on a 4.0 scale.
3. Applications should be submitted directly to the graduate school. Applications should specify the Graduate Certificate Program in College Teaching.

CTC Program Requirements:

All students enroll in two core courses:

- **COMM 702: Introduction to College Teaching** (3 SH; every semester)
  This course is designed to introduce students to pedagogical philosophy and practice in higher education. Ideally, students begin their certificate program with this course.

- **EDUC/XXXX[1] 795: Field Experience** (3 SH; every semester)
  This field experience with weekly seminar is an opportunity for students to teach a course at the college level with structured guidance by a team of seasoned professionals. Arranged in pre-consultation with the chair of the student's home department/program and the CTC director.
- In addition, students select at least 3 SH among these didactic courses:
- **BIOL/EDUC 705: Teaching College Science** (3 SH; every Spring)
- **EDUC 752: Curriculum Design & Delivery** (3 SH; every Fall)
- **EDUC 753: Managing & Monitoring Learning** (3 SH; every Spring)
- **MN 745: Preparing Future Researchers** (1 SH; every Spring)
- **Others** (with prior approval of the CTC program director)

[1]Refers to courses that have been cross-listed to be taken under a prefix in the student's major field.

Communication

Program and Application Information
Department Chair: Dr. Paul E. Nelson
Graduate Coordinator: Dr. Amy O'Connor
Department Location: Ehly Hall
Telephone Number: (701)231-7705
Degree(s) Offered: Ph.D., M.A., M.S.
Application Deadline (Ph.D. only): January 15 for Fall

Test Requirements
GRE (general required; subject recommended)

English Proficiency Requirements
TOEFL ibT 100 for admission, 114 for teaching assistantship
IELTS 7.5

Program Description
The graduate program in communication offers graduate study leading to the M.A., M.S., and Ph.D. degrees. The program prepares students for advanced graduate work, management-level positions, teaching or advancement within their current careers.

The department tailors student research projects and academic programs to individual needs and interests. Students may take interdisciplinary graduate course work to enhance their program of study. In addition, the M.A. and M.S. degrees are available through online delivery. Information also is available on the department's Web site, www.ndsu.edu/communication.

Admissions Requirements

Master of Science or Arts

Programs are open to students holding baccalaureate degrees from accredited universities or colleges. To be admitted with full status to the program, the applicant must

1. Have adequate study in communication, journalism or a related area; and demonstrate potential for advanced study

Faculty

Stephenson J. Beck, Ph.D.
University of Kansas, 2008
Research Interests:
Group and Organizational Communication, Interaction Analysis, Communication Strategy

Ann Burnett, Ph.D.
University of Utah, 1986
Research Interests:
Legal Communication, Small Group Communication, Interpersonal Communication, Gender and Communication

Ross F. Collins, Ph.D.
University of Cambridge, 1992
Research Interests:
Media History, International Media

Elizabeth Crisp Crawford, Ph.D.
University of Tennessee, 2007
Research Interests:
Visual Storytelling, Advertising Message Strategy, Advertising Education

Robert S. Littlefield, Ph.D.
University of Minnesota, 1983
Research Interests:
Intercultural Communication, Risk and Crisis Communication, Forensic History and Pedagogy

Zoltan Majdik, Ph.D.
University of Southern California, 2008
Research Interests:
Science and Risk Communication in Biotechnological Practice, Rhetorical and Argumentation Theory, Ethics and Moral Theory

Mark Meister, Ph.D.
University of Nebraska, 1997
Research Interests:
Rhetorical and Critical Theory, Environmental Communication

and research as evidenced by academic performance and experience.
2. Have earned at the baccalaureate level a cumulative grade point average (GPA) of at least 3.25 or equivalent.
3. Provide a score for the Graduate Record Examination (GRE).

Doctor of Philosophy

Direct-to-doctorate program

Direct-to-doctorate students are selected from among persons with an undergraduate degree, a GPA of 3.50 or higher, and a Graduate Record Examination (GRE) score of 1200 or higher in the combined score for verbal and quantitative areas.

All other doctoral applicants must:

1. Have an undergraduate GPA of 3.25 or higher in communication or a related area. If the undergraduate record is more than 10 years old, the graduate committee may evaluate a candidate's employment in responsible management or professional positions as an alternative to the 3.25 GPA requirement. However, applicants must meet the Graduate School minimum GPA of 3.0 for full standing status.
2. Provide a score for the Graduate Record Examination (GRE).
3. Provide transcripts for undergraduate and master's degree in communication or a related area.
4. Include a writing sample (e.g., thesis, publication or term paper).
5. Include a current curriculum vita.
6. Include three letters of recommendation. (Personal reference reports are available from the Graduate School or Graduate Bulletin.)

Paul E. Nelson, Ph.D.
University of Minnesota, 1968
Research Interests:
Educational Administration, Basic Course Pedagogy, Persuasion

Amy O'Connor, Ph.D.
Purdue University, 2004
Research Interests:
Organizational Communication, Corporate Advocacy, Public Affairs and Issues Management

Charles Okigbo, Ph.D.
Southern Illinois University, 1982
Research Interests:
Social and Behavioral Change Communication, Health Communication

Judy C. Pearson, Ph.D.
Indiana University, 1975
Research Interests:
Instructional Communication, Interpersonal Communication, Family Communication

Carrie Anne Platt, Ph.D.
University of Southern California, 2008
Research Interests:
Rhetoric of Cultural Politics, Gender and Technology, Media in Society

Amber N. W. Raile, Ph.D.
Michigan State University, 2008
Research Interests:
Organizational Communication, Organizational Change, Social Influence

Nan Yu, Ph.D.
Penn State University, 2009
Health Communication, International Communication

Students who fail to meet these requirements for full status, or who have deficiencies in background preparation but demonstrate potential for successful graduate study, may be admitted under a conditional status. In general, evidence must be offered demonstrating that an applicant's potential is not reflected by the academic record. Students who do not show sufficient evidence of communication study at the undergraduate level may be asked to complete certain undergraduate course work in addition to graduate requirements. After meeting the Graduate School standards, the student may request a change to full graduate standing. The student may not earn more than 12 semester graduate credits in conditional status. The request for change of status must be submitted to the Dean of the Graduate School by the major adviser and approved by the department head.

The Department of Communication welcomes international students, but English language facility is a must. International students must have a minimum of 600 on the paper-based TOEFL, 250 on the computer-based TOEFL, 100 on the Internet-based TOEFL or 7 on the International English Language Testing System (IELTS).

Financial Assistance

Students admitted at full or conditional status may apply for teaching assistantships at the master's degree level or at the doctoral level. Teaching assistants teach two speech fundamentals classes or media writing classes each semester. Doctoral-level teaching assistants teach two classes each semester. Depending on experience, a portion of the assistantship may be devoted to assisting with other communication courses. Teaching assistantship deadline is Feb. 15 for the following fall semester.

Graduate assistants receive a stipend and tuition waiver. Applications are available from the department office or online from the department's Web site (www.ndsu.edu/communication). Other assistantships requiring specialized media knowledge may be available through other university offices.

Degree Requirements

Master's program

The Master of Arts or Master of Science program requires completion of a minimum 30 credits of course work with an overall GPA of 3.0 or above. All students must elect to complete a research-based thesis for 6 credits or a paper/experiential project for 3 credits. The degree candidate defends the thesis or paper in an oral examination.
Requirements for the M.A. Degree in Communication (30 credits minimum)

Core Courses (6 credit hours)

Comm 700 Research Methods in Communication
Comm 711 Communication Theory

Research Tools
Two of the following, one of which must be Comm 704, Comm 708 or Comm 767:

Comm 704 Qualitative Research Methods in Communication
Comm 707 Quantitative Research Methods in Communication
Comm 708 Advanced Qualitative Methods in Communication
Comm 710 Advanced Quantitative Methods
Comm 767 Rhetorical Criticism

Elective Specialization
12-15 credits of additional course work, depending on whether the thesis or paper/project option is selected.

Thesis/Paper
6 credits of thesis (798) or 3 credits of paper (797).

Requirements for the M.S. Degree in Communication (30 credits minimum)

Core Courses (6 credit hours)
Comm 700 Research Methods in Communication
Comm 711 Communication Theory

Research Tools
Two of the following, one of which must be Comm 708, Comm 710 or Stat 725:

Comm 704 Qualitative Research Methods in Communication
Comm 707 Quantitative Research Methods in Communication
Comm 708 Advanced Qualitative Methods in Communication
Comm 710 Advanced Quantitative Methods
Comm 767 Rhetorical Criticism
Stat 725 Applied Statistics

Elective Specialization
12-15 credits of additional course work, depending on whether the thesis or paper/project option is selected.

Thesis/Paper
6 credits of thesis (798) or 3 credits of paper (797).

Doctor of Philosophy

The Ph.D. requires 60 semester hours beyond the master's degree. The 60 or more hours must be in a planned course of study approved and overseen by the student's adviser and advisory committee. The student's program will often contain more than the minimum 60 hours. Students with a master's degree in another discipline may be required to complete additional graduate course work in specific areas of communication deemed necessary by the student's adviser and advisory committee. Graduate work taken beyond the master's degree may be judged applicable by the advisory committee, but post-master's graduate credits beyond 9 semester hours will not count toward the 60-hour minimum required for the Ph.D.

To complete the program, students must demonstrate a/an

1. thorough grasp of perspectives on the nature of communication as an applied science and the process of theory construction and testing.
2. broad knowledge of theories and research in various applied communication contexts.
3. in-depth knowledge of the communication context chosen as the student's area of specialization.
4. competence in a cognate field which supports the student's area of specialization.
5. broad knowledge of various communication research methods and statistical procedures, with expertise in either qualitative or quantitative methodologies.
6. Requirements

Minimum of 30 credit hours in didactic courses to include

1. **Core Courses (12 credit hours)**
   Comm 701 Advanced Research Methods I
   Comm 711 Communication Theory
   Comm 705 Advanced Communication Theory
   Comm 703 Advanced Research Methods II
   (Note: Persons with a communication master's degree may be exempt from one, or more, of these core courses.)
2. **Major Concentration:** Minimum of 21 credit hours of courses including a major concentration. (Generally, the core courses will not comprise a portion of the concentration.)
   Minimum of 15 credit hours in the departmental 700-789 courses.
   Minimum of 6 credit hours at the 700-789 level in a cognate area outside the department that represents a coherent unit of study (such as education, sociology, psychology, or business).

30 credit hours in research and research courses to include

1. **Research Courses**
   Minimum of 15 total credit hours of research courses. Of these, a minimum of 12 credit hours of didactic research courses (6 credit hours may be transferred from the master's degree).
   A maximum of 9 credit hours of independent study conducting research.
2. **Dissertation Credit Hours**
   Minimum of 15 credit hours of dissertation research. The department does not limit the number of dissertation credit hours.

Comprehensive Synthesis

When course work is nearly completed, doctoral students will meet with their advisers to determine if they are prepared to write a synthesis of the student's course work, in consultation with the Director of Doctoral studies, presentations and publications, teaching or other applied work, and professional or other service.

When the adviser and Doctoral Director agree, the student will compose a scholarly comprehensive synthesis. After completion, the doctoral committee will evaluate the written work. If the committee deems the work to be generally acceptable, the adviser will schedule an oral examination, during which the student will defend his or her composition. If the work is unacceptable, the student may be offered a second chance to rewrite the composition. A student whose work is generally acceptable may or may not pass the oral portion of the preliminary examination. If the committee is willing, the student will be allowed a second opportunity to defend his or her answers orally. Students can be offered a maximum of two attempts to complete the written or oral portions of the comprehensives. (For a complete description of the comprehensive synthesis, please see the doctoral program description at http://www.ndsu.edu/communication/phd_program/comprehensive_exams/.)

Community Development

Program and Application Information

Program Coordinator: Dr. Gary Goreham
Location: Barry Hall 226
Email: **Gary.Goreham@ndsu.edu**
Telephone Number: (701)231-7637
Degree(s) Offered: M.A., M.S.

English Proficiency Requirements
TOEFL ibT 71
IELTS 6

Program Description

The Department of Sociology, Anthropology, and Emergency Management in cooperation with the Department of Agribusiness and Applied Economics offer a master's degree in Community Development. The degree is a multi-institutional, multi-disciplinary, online program in conjunction with the Great Plains Interactive Distance Education Alliance (IDEA). Other institutions participating in this program include Iowa State University, Kansas State University, the University of Nebraska -Lincoln, and South Dakota State University.

The primary audience for this program is community economic development officials and specialists already employed in the field.

The program requires a total of 36 credit hours, including 16 credits (six courses) of Core, 15 credits in two of the four Track areas, and up to six credits of thesis. The four Track areas include Building Economic Capacity, Natural Resource Management, Working with Native Communities, and Non-profit Leadership.

Program Objectives

The objectives of the Community Development graduate degree program are to:

1. Increase the skills, knowledge, and competencies of community economic development officials who are currently employed and have limited opportunity to participate in an on-campus degree program.
2. Provide graduate training for individuals entering the community economic development career field who require training/degrees for career advancement.
3. Enhance the community economic development skills, knowledge, and competencies of individuals working with Native American communities, natural resource-based communities, non-profit organizations, and/or state and local government.

Program Requirements

A total of 36 credits are required for the master's degree program. Students will write a thesis or complete a creative component (Plan B) to capstone the degree program, which will be worth six credit hours. The student's schedule of courses must be approved by the Faculty Advisor and the Campus Coordinator. Students may select either a Masters of Science (MS) or Masters of Arts (MA) option. The MA option requirement normally includes two (2) years of a foreign language. This requirement can be satisfied with undergraduate courses and/or a proficiency examination.

Students will be required to take all of the six Core courses and an additional 15 credits selected from at least two tracks. The Core courses are:

Community Development Orientation (1credit)
Community Development I: Principles and Strategies of Community Change (3 credits)
Community Development II: Organizing for Community Change (3 credits)
Community Analysis: Introduction to Methods (3 credits)
Community and Regional Economics and Analysis (3 credits)
Community and Natural Resource Management (3 credits)

There are presently four tracks that have been developed from which students may choose. These include:
Building Economic Capacity
Natural Resource Management
Working with Native Communities
Non-profit Leadership

A sample schedule for a student in the Building Economic Capacity track may look as follows:

Year One

Fall Term	**Spring Term**	**Summer Term**
Community Development Orientation (1 cr.)	Community Development II (3 cr.)	Community and Natural Resources Management (3 cr.)
Community Development I (3 cr.)	Community and Regional Economics and Analysis (3 cr.)	
Community Analysis: Introduction to Methods (3 cr.)		

Year Two

Fall Term	**Spring Term**	**Summer Term**
Economic Development and Strategies and Programs (3 cr.)	Cluster and Regional Economic Development Workshop (3 cr.)	Real Estate (3 cr.)
Impact Analysis (3 cr.)	Thesis (2 cr.)	Thesis (3 cr.)
Cost Benefit Analysis (3 cr.)		
Total = 36 Credits		

Admission Requirements

1. Complete the application to the NDSU Graduate School (including references and a statement of purposes).
2. Provide official transcripts from each college or university you have attended or at which you are currently enrolled, including all undergraduate and graduate work.
3. Have achieved a 3.00 GPA in previous academic work.

For additional information: www.gpidea.org/prospective/community/cdProgram.html

Computer Science

Program and Application Information

Department Head: Dr. Brian Slator

Graduate Coordinator: Dr. Kendall Nygard

Department Location: 258 IACC

Email: **Kendall.Nygard@ndsu.edu**

Telephone Number: (701)231-8562

Degree(s) Offered: Ph.D., M.S.

Application Deadline: April 15

Test Requirements

GRE (recommended)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Department of Computer Science and Operations Research offers the M.S. and Ph.D. in Computer Science. Graduate course work in Operations Research is offered and may be used to provide an operations research concentration to either program. For additional information, please contact the department chair (701) 231-6124.

Admissions Requirements

The following minimum qualifications are required of all students seeking an advanced degree:

Master of Science

1. The applicant must have a baccalaureate degree from an educational institution of recognized standing.
2. The applicant must show, by a combination of educational background, academic performance, and work experience,

Faculty

Anne Denton, Ph.D.
University of Mainz, Germany, 1996
Research Interests:
Data Mining, Bioinformatics, Scientific Informatics, Educational Technology, Model Building, Databases

Hyunsook Do, Ph.D.
University of Nebraska, 2007
Research Interests:
Software Engineering, Software Testing, Maintenance, and Empirical Methodologies.

Xiaojiang (James) Du, Ph.D.
University of Maryland, 2003
Research Interests:
Wireless Sensor Networks, Mobile Ad Hoc Networks, Computer Networks, Network Security

Yan Gu, Ph.D.
Georgia Institute of Technology, 2007
Research Interests: Parallel and Distributed Simulations

Dean Knudson , Ph.D.
Northwestern University, 1972
Research Interests:
Software Development and Management

Jun Kong, Ph.D.
University of Texas, Dallas, 2005
Research Interests:
Software Engineering; Human-Computer Interaction; Model Management

the potential to succeed in advanced study and research in computer science. Minimum preparation usually includes the ability to program in one or more modern, commonly used high-level languages; at least one semester of calculus; and experience in using data structures such as linked lists and binary trees. Minimum preparation for unconditional admission to the master's program would normally include courses in computer science principles and theory equivalent to the NDSU courses CSci 160, 161, 222 or 335, 372, and 373.

3. The applicant for the M.S. must have a cumulative grade point average (GPA) in all previous courses of at least 3.0 (out of 4.0) or equivalent to attain full standing.
4. International students are welcome. They must submit a TOEFL score of at least 550 (paper-based), 213 (computer-based) or 79 (internet-based) to be considered for admission. Eligibility for a teaching or tutoring assistantship requires passing the test of spoken English (TSE) and achieving a TOEFL score of at least 600 (paper-based), 250 (computer-based) or 100 (internet-based).

Doctor of Philosophy

1. The applicant must have a bachelor's degree or a master's degree in computer science. In some cases, students with a degree in a closely related area may be considered.
2. Admission to the program is competitive, and requirements for admission to this program are more rigorous than for admission to the M.S. program. In order to be considered seriously, an applicant must normally have the equivalent of at least a 3.25 GPA (on a 4-point scale). The admissions committee will look at the applicant's overall academic record, as well as any relevant employment and professional experience. Of particular importance is evidence of the

Jun Kong , Ph.D.
University of Texas, Dallas, 2005
Research Interests:
Software Engineering; Human-Computer Interaction; Model Management

Kenneth Magel, Ph.D.
Brown University, 1977
Research Interests:
Software Engineering, Human-Computer Interfaces, Computer Networks, Subsymbolic Computation

John Martin, Ph.D.
Rice University, 1971
Research Interests:
Theoretical Computer Science, Theory of Computation

Kendall Nygard, Ph.D.
Virginia Polytechnic Institute and State University, 1978
Research Interests:
Electronic Commerce, Software Agents, Operations Research, Sensor Networks, Artificial Intelligence

William Perrizo, Ph.D.
University of Minnesota, 1972
Research Interests:
Distributed Database Systems, Centralized Database Systems

Brian Slator, Ph.D.
New Mexico State University, 1988
Research Interests:
Artificial Intelligence, Educational Games

applicant's potential for scholarship and independent research at the Ph.D. level.

3. International students are welcome. TOEFL exam requirements are the same as for the MS degree.

Financial Assistance

Teaching assistantships are available to graduate students. Teaching one section of a lower division service course requires 10 hours of work per week and qualifies the student for a waiver of graduate tuition. Other assistantships that provide a stipend and tuition waiver include research assistantships, which involve assisting faculty with their research, and graduate service assistantships, which involve tutoring, grading or computer-related work with faculty members or organizations on campus. Related previous experience increases the likelihood of a teaching or tutoring assistantship being awarded. For all assistantships, a student's chances are greater after he/she has been at NDSU one or two semesters.

The department offers a tuition waiver only to students who are awarded an assistantship. There is a scholarship program, that includes a tuition waiver, administered by the Dean of the Graduate School. Students should contact the Graduate School office for application forms.

An application for assistantship requires completing an online application sent to the department. Applications for fall semester received by April 15 will be given full consideration.

Degree Requirements

Master of Science

Semester core courses (required of all students):

CSci 708 Foundations of Programming

CSci 713 Software Engineering I

Vasant Ubhaya, Ph.D.
University of California-Berkeley, 1971
Research Interests:
Algorithm Analysis, Operations Research

Dianxiang Xu, Ph.D.
Nanjing University, China, 1995
Research interests:
Software Engineering, Software Security, Applied Formal Methods, Testing, Software Agents

Weiyi (Max) Zhang, Ph.D.
Arizona State University, 2007
Research interests:
Computer Networks; Wireless Networks and Network Security

Emeritus

Bruce Erickson, Ph.D.
Yale University, 1973
Research Interests:
Theoretical Computer Science, Graph Theory

Robert Gammill, Ph.D.
Massachusetts Institute of Technology

CSci 724 Survey of Artificial Intelligence
CSci 765 Introduction to Database Systems

Thesis Option:

1. 32 total graduate credits
2. 12 core course credits plus two research seminar credits
3. 8-12 credits of additional graduate coursework
4. 6-10 credits of thesis research
5. Research adviser should be selected by the fourth semester of attendance at NDSU
6. Comprehensive Examination (on the core courses) completed by the end of the fourth semester.
7. Final defense.

Comprehensive Study Option:

1. 32 total graduate credits
2. 12 core course credits plus two credits of research seminar
3. 14-16 credits of additional graduate coursework
4. 2-4 credits of research
5. Research adviser should be selected by the fourth semester of attendance at NDSU
6. Comprehensive Examination (on the core courses) completed by the end of the fourth semester
7. Final defense

A maximum of 9 semester credits may be transferred into the program. Such courses have to be approved on the plan of study. There may be a maximum of 6 credits of independent study.

All course work must be approved by the student's adviser, Supervisory Committee, department chair, and graduate dean through the plan of study.

Doctor of Philosophy

1. 90 credits with up to 30 included from the M.S. degree
2. 30 credits of research credit
3. Research adviser should be selected by the fourth semester at NDSU
4. Qualifying examination (written based on the M.S. core courses)
5. Research proposal presentation and defense

6. Dissertation
7. Final defense

There are some additional requirements on the course work:

1. The 90 credits must include three sequences of two courses each at the graduate level in computer science.
2. Beyond the M.S. degree, a maximum of 9 credits of course work can be transferred. The remainder must be taken at NDSU.
3. The 90 credits (including any credits transferred) must be computing-related with at least 45 credits involving significant graduate level computer science material. Generally, these credits would be offered by a computer science department.
4. The 90 credits may include a maximum of 15 credits of non-didactic courses (independent studies or seminars). Seminars are limited to four of those credits.
5. The student's advisory committee, the department chair, and the graduate dean all must approve the course work on the plan of study

Construction Management

Program and Application Information

Graduate Coordinator: Charles McIntyre

Email: **charles.mcintyre@ndsu.edu**

Department Location: AR/LA 106

Telephone Number: (701) 231-7879

Degree Offered: M.S.

Application Deadlines: Refer to Admissions Requirements

English Proficiency Requirements

TOEFL: 525 (paper-based), 197 (computer-based), or 71 (internet-based)

IELTS: 6

Program Description and Delivery

The Master of Science (M.S.) degree in Construction Management prepares students for managerial opportunities in the construction industry. The program focuses on the core elements of estimating, scheduling, equipment, and project management. In addition to these core elements, students choose from a variety of elective courses to develop an individual plan of study with the assistance of their faculty adviser. This M.S. degree provides students with an opportunity to increase their technical knowledge, to develop an interdisciplinary understanding of the construction industry, and to prepare them for entry level or advanced positions in the construction profession.

The M.S. Construction Management degree has two distinct delivery methods, on-campus and on-line. The on-campus program offers classes that are located on the NDSU main campus. The on-line program is delivered through Distance

Faculty

Graduate Program Director

Charles McIntyre, Ph.D.

The Pennsylvania State University, 1996

Research Interests:

Engineering & Construction Education, Project Scheduling & Control, Land Development, Decision Support Systems

Eric Asa, Ph.D.

University of Alberta, 2002

Research Interests:

Infrastructure and Assets Management, Construction Materials, Engineering Education, Computational Modeling

Darshi De Saram, Ph.D.

The Hong Kong Polytechnic University, 2002

Research Interests:

Construction Coordination, Managing for Quality and Safety, Organizational Dynamics and Culture, Professional Education

Zhili (Jerry) Gao, Ph.D.

Iowa State University, 2004

Research Interests:

Design and Construction Visualization, BIM, Concrete Materials and Construction, Bridge Engineering

Mohamed Saafi, Ph.D.

University of Alabama, 2001

Research Interests:

Concrete, Nano-technology, Composites

and Continuing Education (DCE) at NDSU and can be entirely completed on-line.

On-Campus Program Description

The on-campus Master of Science (M.S.) degree in Construction Management is offered with two options: 1) a thesis option and 2) a comprehensive study (paper) option. The thesis option (31 credits) emphasizes original research, requires a scholarly thesis, and an oral defense. The comprehensive study (paper) option (31 credits) emphasizes applied research applications in the construction industry, requires a comprehensive study research paper, and an oral defense.

On-Line Program Description

The on-line M.S. degree in Construction Management requires the comprehensive study (paper) option (31 credits) that emphasizes applied study and research within the construction industry. The on-line comprehensive study (paper) option requires an oral defense which can be completed on-line. For additional information, refer to the **NDSU Distance and Continuing Education (DCE) website**.

Admissions Requirements

1) To be admitted into the M.S. program in Construction Management applicants must:
   Have earned a baccalaureate degree in construction, engineering, architecture, or other related discipline with a minimum CGPA of 3.0 or equivalent to attain full standing. Submission of an official transcript is required.
2) Submit a two-page resume.
3) Submit three (3) three letters of recommendation. Personal reference report forms are available on the NDSU Graduate School website.
4) Submit applications directly to the NDSU Graduate School via the on-line application process.

Jongchul Song, Ph.D.
The University of Texas at Austin, 2005
Research Interests:
Information and Sensing Technology Applications in Construction and Transportation, Modular Construction, Asphalt Pavement Construction, and Maintenance

J.K. (Janet) Yates, Ph.D.
Texas A&M University, 1986
Research Interests:
Global Engineering and Construction, Sustainable Industrial Construction, Construction Contracts and Law, Productivity Improvement, and Construction Failures

The Graduate Record Examination (GRE) is not required.

All applications are evaluated by the CM&E Department on a continuous basis once reviewed by the Graduate School for completeness and submitted to the CM&E Department for a recommendation.

There are no deadlines for applications from domestic applicants. It is recommended that domestic applicants complete their application at least four (4) weeks prior to the start of classes.

For international students, a minimum score of 525 (paper-based), 197 (computer-based), or 71 (internet-based) must be achieved on the TOEFL, or a score of 5.5 on the IELTS. For international applicants all application materials must be received before May 1 for the fall semester and prior to August 1 for the spring semester.

Financial Assistance

Various types of financial assistance are available to graduate students and are described on the **Graduate School website**.

For exceptional on-campus applicants, the CM&E Department may offer a graduate assistantship which consists of a monetary stipend and a possible tuition waiver, but student activity fees and program fees are not waived. There is no application process for graduate assistantships. Applicants are evaluated based on their credentials and/or experience. Please refer to **graduate assistantships policy** and the policy **"English Language Proficiency for Teaching Assistants"**.

Graduate assistantships are not available to on-line applicants. For additional information related to tuition and fees refer to the following link:
http://www.ndsu.edu/bisonconnection/accounts/tuition/

Degree and Credit Requirements

The M.S. degree in Construction Management is offered in two options: 1.) the thesis option and 2.) the comprehensive study (paper) option. Both options require a total of 31 graduate-level

credits. The primary difference between the thesis option and the comprehensive study (paper) option is that the thesis option requires 25 credits of coursework and 6 credit of research (thesis), while the comprehensive study option requires 28 credits of coursework and 3 credit of research (paper). In addition, the thesis requires the creation and presentation of new knowledge in providing a solution to a problem while the comprehensive study (paper) option requires a thorough understanding of existing knowledge and the ability to apply that existing knowledge to a problem of interest. The thesis option is only available to on-campus graduate students.

A typical plan of study for both options is shown below:
CM&E 790 - Graduate Seminar (1 credit)
CM&E 603 - Scheduling and Project Control (4 credits)
CM&E 611 - Construction Cost Estimating (4 credits)
CM&E 701 - Construction Technology and Equipment (4 credits)
CM&E 612 - Construction Management (3 credits)
CM&E 600 or 700 Level Electives (9 credits for the thesis option and 12 credits comprehensive study (paper) option)
CM&E 797 – Master's Paper (3 credits applied to the comprehensive study (paper) option)
CM&E 797 – Master's Thesis (6 credits applied to the thesis option)

A minimum cumulative grade point average (CGPA) of 3.0 must be achieved in order to complete the M.S. degree.

Counselor Education/Education/ Educational Leadership

Program and Application Information

Department Head: Dr. William Martin

Graduate Coordinator: Dr. Robert Nielsen

Email: **Robert.Nielsen@ndsu.edu**

Department Location: School of Education, Evelyn Morrow Lebedeff Hall

Telephone Number: (701)231-7921

Degree(s) Offered: M.Ed., M.S.

Application Deadline: February 1

Test Requirements

Miller Analogies Test (MAT) or GRE may be required.

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The School of Education offers graduate study leading to the Master of Education (M.Ed.) and Master of Science (M.S.) degrees. Graduate majors in the areas of counseling (school and community), educational leadership (K-12 and higher education), teacher education (curriculum and instruction or discipline-specific programs), agricultural education, and family and consumer sciences are offered. The Master's and Specialist degrees in Educational Leadership (Ed.S.) involves course work through the Tri-College University . A doctoral program in Education (Ph.D. and Ed.D.) with options in Institutional Analysis and Occupational and Adult Education, and a Human Development -Counselor Education track in the Human Development and Education Ph.D. program are also offered.

School of Education Faculty

Mari Borr, Ph.D.
University of North Dakota, 2005
Research interests: Qualitative Research, Family and Consumer Science Education, Adolescent Development, Experiential Learning, and Professional Development Evaluation

Carol E. Buchholz, Ph.D.
Kansas State University, 2005
Research interests: School Counseling; Career Education, Crisis Management Preparation, Trauma

Stacy Duffield, Ph.D.
University of North Dakota, 2003
Research interests: Literacy, Learning Theory, and Instructional Practices

Myron Eighmy, Ph.D.
University of Minnesota, 1995
Research Interests: Higher Education Policy, Training and Human Resources Development, State and Federal Policy for Workforce Education and Training

Kathy B. Enger, Ph.D.
University of North Dakota, 2003
Research Interests: Collaborative leadership in higher education, Women and leadership in th feminized professions, Strategic planning, Citation analysis

The NDSU programs in education are accredited by National Council for Accreditation of Teacher Education and are approved by the ND Education Standards and Practices Board. Changes in national and state legislation, standards, or rules can affect academic program requirements.

Doctoral Program in Education

The following doctoral degrees in Institutional Analysis and Occupational and Adult Education are offered. 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. The Doctor of Philosophy (Ph.D.) degree requires extensive inquiry involving quantitative and/or qualitative research, culminating in a dissertation that will develop and/or test theory.

The Institutional Analysis option is unique and focuses on mid-management needs regarding assessment, evaluation, research, and institutional analysis. This program involves data-drive statistical knowledge, comprehensive research skills, and dispositions needed to work with both academia and other environments, such as business, military, and government.

The Occupational and Adult Education option uniquely addresses emerging needs in all aspects of adult education. This option specifically relates to entrepreneurial-alternative deliveries that enhance emerging professional development and advanced training for business, industry, government, and military enterprises. This program integrates assessment and evaluation techniques, statistical skill, and research knowledge with curriculum and instructional development for workplace needs.

Brenda Hall, Ed.D
Virginia Polytechnic Institute and State University, 1993
Research Interests: Intimate Partner Violence, Community/School partnerships, Collaborative Group Practices

Thomas Hall, Ed.D.
University of South Dakota, 2005
Research Interests: Community Education, Adult Learning

Gerald Ketterling, Ph.D.
University of Iowa, 1992
Research interests: Science Education; Problem-Based Learning Across the Science Curriculum; Student Centered Inquiry in the Science Classroom; Alternative Certification Curriculum

Denise K. Lajimodiere, Ed.D
University of North Dakota, 2006
Research Interests/Area of Expertise: Native American Female Leadership; Horizontal Violence/Relational Aggression and girl bullying among young Native females living on reservations

William O. Martin, Ph.D.
University of Wisconsin, 1993
Research interests: Mathematics Education, Assessment

Larry Napoleon, Ph.D.
The Pennsylvania State University-University Park, 2009
Research Interests: Student Options and Retention, Career and Technical Education, Historically Disenfranchised Learners, African-American History

Counseling Program (Counselor Education)

The principle purpose of the program is to provide professional/academic education for individuals preparing for mid-management administrative positions (i.e., elementary school principal, secondary school principal or higher education administrator), and upper-level administrative positions (i.e., superintendent of schools). The Educational Leadership program prepares students for Master of Education (M.Ed), Master of Science (M.S.) and Education Specialist (Ed.S.) degrees in Educational Administration. Programs meet certification requirements in the various areas appropriate to K-12 administration.

Educational Leadership

The principle purpose of the program is to provide professional/academic education for individuals preparing for mid-management administrative positions (i.e., elementary school principal, secondary school principal, or higher education administrator), staff administrative positions (i.e., school district business managers, technology coordinators, or curriculum coordinators), and upper-level administrative positions (i.e., superintendent of schools). The Educational Leadership program prepares students for Master of Education (M.Ed), Master of Science (M.S.) and Education Specialist (Ed.S.) degrees in Educational Administration. Programs meet certification requirements in the various areas appropriate to K-12 administration.

Teacher Education

The graduate program in Teacher Education is committed to the further development of educational leaders who are dedicated to educational equity for all persons. The Teacher Education graduate program is aligned with the National Board for

Robert C. Nielsen, Ed.D.
University of Northern Colorado, 1973
Research Interests: School Counseling, Stress Management, Cognitive Counseling

Claudette Peterson, Ed.D.
Oklahoma State University, 2006
Research Interests/Areas of Expertise: Adult Education, Nonformal Education, Learning Strategies, Instrumented Learning

David Silkenat, Ph.D.
University of North Carolina at Chapel Hill, 2008
Research Interests: History Education, Social Studies Education, Gifted Education

Justin J. Wageman, Ph.D.
University of North Dakota, 1999
Research Interests: Standards, Curriculum, Instruction, Assessment, Professional Development and Evaluation

Anita Welch, Ph.D.
University of Kansas, 2007
Research Interests: Science Education, Curriculum Design, "At-Risk" Youth, Informal Science Education

Professional Teaching Standards (NBPTS) to reflect the importance of applied research and content development of educators.

Programs offered in Teacher Education focus on the development of educational leaders and are designed for the practitioner. Students will engage in action research as a component of the program. Due to the unique nature of the program, candidates must have access to a teaching setting.

Plans of study for either the M.Ed. or M.S. in Teacher Education may emphasize curriculum and instruction or specific education disciplines including: Agricultural Education, English, Modern Languages, Health, Family and Consumer Sciences, Mathematics, Music, Physical Education, Science, History, Social Studies and Speech. Students are encouraged to work closely with an academic adviser to ensure that personal and professional goals are clear and achievable. Some of the options with unique features are described in more detail below and on the next page.

Curriculum and Instruction

The program focuses on further development of teacher leaders through study of instructional delivery and enhancement. The program curriculum includes areas of human development, learning, foundations of education, school curriculum, roles of schools and society, and further study in areas of interest. Candidates choosing this option for an M.S. degree must also complete a thesis.

Music Education

The Master of Education (M.Ed.) degree with a Music Education option is a dual program offered collaboratively by the School of

Brent Young, Ph.D.
Oklahoma State University, 2006
Research Interests: Building Academic Skills in the Context of Career and Technical Education, Student Learning and Achievement in Agricultural Education, Student teacher-cooperating teacher relationships, Experiential Learning

Nathan Wood, Ph.D.
University of Minnesota, 2006
Research Interests: Relationships Among Affective and Social Factors, Learning, and Achievement

Education and the Department of Music. The program is designed to facilitate the needs of currently working music teachers as well as students who wish to continue their education to the master's level after having completed the baccalaureate degree. It is possible to complete the M.Ed. degree in Music Education by attending three consecutive summer sessions, two years in residence during the academic year, or a combination of both. Most courses in the degree program are offered in the late afternoon or evening.

Applied study may be in the areas of vocal, instrumental, or conducting. Students electing the choral emphasis will take vocal pedagogy and survey of choral literature. Students electing the instrumental emphasis will take instrumental pedagogy (woodwind, brass, or percussion) and survey of band literature. No thesis is required; rather, students will complete 2 three-credit hour practicum experiences: one in education and one in music. The practica will be agreed upon and planned jointly by the student and his/her adviser(s).

Science Education

The M.Ed. (Science Education) degree option provides secondary science teachers with an enriched foundation in pedagogy, the sciences, and scientific research. The degree consists of 16 semester hours of education courses, 15 semester hours of graduate-level science courses, a practicum (classroom teaching) project, and a science research experience. The final requirement of this M.Ed. degree is the oral defense of a portfolio of accomplishments completed during the program.

The science requirements may be fulfilled by completing a variety of graduate science courses, many of which are offered during the summer months. Teachers are encouraged to discuss this degree option with a Science Education adviser from the NDSU Center for Science and Mathematics Education.

Agricultural Education

Agricultural Education offers graduate study leading to the M.Ed. and M.S. degrees. Advanced work may involve specialized training in vocational education, extension education, international extension, and agricultural education.

Degree programs are planned cooperatively to meet the needs of individual students. Candidates are encouraged to include supporting work relevant to subject matter areas of

interest. Some courses focus on problems related to various phases of Agricultural Education, including secondary, post-secondary, adult, and extension programs. Others emphasize issues common to all service areas in agricultural and extension education. Provision may be made for candidates to include internships in agribusiness, natural resources education, or other aspects of agricultural and extension education in their programs. Candidates should work closely with an adviser.

Family and Consumer Sciences Education

Students have the option of pursuing an M.Ed. or M.S. degree in Family and Consumer Sciences Education. Advanced work may be taken in FCSE, vocational education, extension, and curriculum design and development.

This program is designed to provide students with an expanded background in Family and Consumer Sciences Education as well as the broader field of education with a solid foundation in research methodology. Students are encouraged to complete additional course work in areas of interest. Internships can be incorporated into the program of study and provide an opportunity for students to examine current issues. Candidates should work closely with an adviser.

Admissions Requirements

Qualified students may apply for admission to graduate programs in the School of Education leading to Doctor of Education (Ed.D.), Doctor of Philosophy (Ph.D.), Education Specialist, (Ed.S.), Master of Education (M.Ed.), or Master of Science (M.S.) degrees. In addition to requirements described under academic information elsewhere in this bulletin, criteria are stated below that will be considered at the time of application for admission into graduate study. Admission to a doctoral, master's or education specialist program is considered only after all required application materials have been received and reviewed. Where appropriate, all international student requirements must be met. If a program has a cohort group with enrollment limitations, an entrance interview will be required.

For the doctoral programs in Education the required materials are:

1. A statement of career goals consistent with the goals of either the Ed.D. or Ph.D. program.,
2. Official transcripts of baccalaureate and master's (or equivalent) degrees from accredited institutions,

3. Three letters of recommendation attesting to demonstrated academic strength in undergraduate and/or master's (or equivalent) degrees, and
4. A master's degree GPA of 3.0 or equivalent.

For the Human Development -Counselor Education Ph.D. program see Human Development and Education.

Required materials for the Education Specialist (Ed.S.) degree in Educational Leadership are:

1. A completed signed application form;
2. Official transcripts of all previous collegiate work, including one verifying graduation with a master’s degree from an accredited institution;
3. A cumulative GPA of 3.25 or higher in all graduate-level courses;
4. Resume including credentials, licenses and certificates;
5. Two references that evaluate the applicant’s potential for success as a graduate student and as an educational leader; and
6. A leadership essay.

For either the Master of Education (M.Ed.) or the Master of Science (M.S.) programs the required materials are:

1. A completed, signed application form;
2. Official transcripts of all previous collegiate work, including one verifying graduation with a baccalaureate degree from an accredited institution;
3. A cumulative baccalaureate GPA of 3.0 or higher on a 4.0 scale or equivalent.
4. Resume including credentials, licenses and certificates;
5. Two references that evaluate the applicant's potential for success as a graduate student in the chosen master's degree program and as an educational leader; and
6. A leadership essay.

The School of Education reserves the right to obtain additional information about the student's professional competence from qualified professionals.

Admission decisions are based upon the predicted success of the applicant as a student and professional in the chosen field and are made only after considering all available data.

NOTE: Earning an academic/professional degree does not necessarily lead to state credential or licensure. People seeking licensure must provide evidence of the required number of years of teaching or counseling, and, in the case of school administration, administrative experience. Potential and current students should consult with the appropriate academic program coordinator for advice about licensure, certification, or credentialing after communicating with the appropriate state official.

Full Standing Admission

A student must meet all requirements for full admission. The following criteria act as guidelines for full acceptance: A cumulative baccalaureate GPA of 3.0 or better on a 4.0 scale, a GPA of at least 3.25 during the final 30 semester credits of graded undergraduate course work, or a minimum GPA of 3.0 on 10 semester credits of graduate course work.

Conditional Admission

A student who does not meet all requirements for full admission may be admitted with conditions by showing evidence that the applicant's potential is not adequately reflected by her/his record. The following criteria act as guidelines for conditional acceptance: A minimum cumulative GPA of 2.80 or better on a 4.0 scale, and MAT (or GRE) scores that show prospects of satisfactory graduate school performance.

A student admitted to this status will be provided with a statement of the conditions necessary to be satisfied before advancement to full standing. A student must be advanced to full standing before a plan of study can be approved.

After being accepted for graduate study in the School of Education, the student should contact an adviser assigned to her/him for assistance in filing a plan of study for consideration by the School of Education.

All enrollments in Education courses before the student files a graduate plan of study must be approved by the adviser. The School of Education will evaluate graduate courses taken prior to filing the graduate plan of study when the student's plan of study is being considered. Only

those courses approved by the School of Education may be included on the final plan of study leading to the degree.

Financial Assistance

Graduate assistantships are available in the School of Education. Applications are considered on the basis of scholarship, potential to undertake advanced study and research, and financial need. Students must be accepted into the Graduate School before they are eligible for an assistantship.

Degree Requirements

Doctoral degree programs within the School of Education require a minimum of 90 semester hours beyond the bachelor's degree (a minimum of 60 semester hours beyond the master's degree). For the Human Development -Counselor Education doctoral program, see Human Development and Education.

Master's programs within the School of Education require a minimum of 30 semester credits (minimums vary by academic program). The Master of Science (M.S.) degree requires a disquisition. The Master of Education (M.Ed.) degree is a non-disquisition, practitioner-oriented degree. Programs vary on requiring a written comprehensive exam or a portfolio/oral.

Criminal Justice

Program and Application Information

Department Head: Dr. Kevin Thompson

Graduate Coordinator: Dr. Carol Archbold

Email: **Carol.Archbold@ndsu.edu**

Department Location: Criminal Justice & Public Policy Building

Telephone Number: (701)231-8567

Degree(s) Offered: Ph.D., M.S.

Application Deadline: April 1 (Ph.D. applicants)

Test Requirements

GRE (for both M.S. and Ph.D. applicants)

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Criminal Justice offers graduate study leading to both a MS and a Ph.D. degree in Criminal Justice. The MS degree has two tracks; Applied Criminal Justice and Criminology. The program in Criminal Justice is designed to enhance student's skills in understanding, gathering, processing, and analyzing research in the areas of criminology and criminal justice. The topical curriculum is geared to understanding, critiquing, and analyzing the criminal justice system with an orientation toward urban issues as they impact crime and criminal justice. The curriculum consists of foundation courses in theory, policy, and research methods, plus three substantive areas: 1) criminology, 2) policing, and 3) corrections. Students have their choice of specializing in one of the three. Elective course work can include classes such as Violence, Gender and Justice, and crime commodities. Students also will be afforded course work in learning how to teach a college course.

Faculty

Carol Archbold, Ph.D.
University of Nebraska-Omaha, 2002
Research Interests:
Police Studies, Race and the Criminal Justice System, Alternative Dispute Resolution and the Criminal Justice System, Qualitative Research Methods

Sarah E. Browning, Ph.D.
University of Toronto, 2007
Research Interests:
Substance Use and Abuse, Violence, Quantitative Methods, Criminological Theory

Thomas D. McDonald, Ph.D.
Southern Illinois University, 1972
Research Interests:
Criminal Justice, Deviant Behavior, Social Disorganization, Evaluation Research

Amy J. Stichman, Ph.D.
University of Cincinnati, 2003
Research Interests:
Corrections, Institutional Life, Inmate and Correctional Officer Attitude, Treatment Program Evaluation

Kevin M. Thompson, Ph.D.
University of Arizona, 1986
Research Interests:
Delinquency, Quantitative Methods, Alcohol and Drugs, Juvenile Drug Courts

Graduates will find an expanding and terrific academic job market available as well as professional employment in the criminal justice policy and research sector. There are currently less than 40 Criminal Justice Ph.D. programs operating on a national level, so students graduating with a Criminal Justice Ph.D. will be competitive for the 350 positions available annually in academic units.

Ph.D. in Criminal Justice

Admissions Requirements

Students should enter the program with either a baccalaureate degree or with an approved master's degree. Students will be required to have had one course in research methods; and one course in statistics. Plus, students should have adequate background preparation or demonstrated potential in the field of Criminology or Criminal Justice.

Students will be required to take the Graduate Record Examination (GRE) and submit their undergraduate and/or graduate transcripts. For admission to full standing, students are required to attain a combined minimum score on the GRE of 1,000 (verbal and quantitative) and achieve a minimum grade point average of 3.0 over their last 60 credit hours. Students not meeting these standards will be evaluated and possibly admitted on conditional status.

A student entering the program with a master's degree would take a minimum of 60 credit hours. Students entering the program with a master's degree should submit their research thesis to the graduate committee for review. This committee would be charged with determining whether the research project

Courtney A. Waid, Ph.D.
Florida State University, 2008
Research Interests:
Inmate Treatment Programs, Criminal Victimization, Juvenile Justice

Political Science

Nicholas Bauroth, Ph.D.
Loyola University , Chicago , 2003
Research Interests:
State and Local Politics, Politics of Crime

Affiliated faculty

Wendy Troop-Gordon, Ph.D.
University of Illinois at Urbana-Champaign, 2002
Research Interests:
Violence and Aggression, Adolescent Development, Victimization, Quantitative Methods

Joel Hektner, Ph.D.
University of Chicago, 1996
Research Interests:
Aggression, Research Methods, Peer Influence on Delinquency

is sufficient in scope and depth to warrant further supervised research.

Degree Requirements

The curricular structure of the program is listed below for students entering the program without a master's degree:

Credits

1. Theory/Policy courses --- 9
2. Research skills --- 12
3. Substantive Area --- 18
4. Electives --- 18
5. Individual Study/Dissertation --- 36
6. Total --- 90
7.

Theory/Policy Courses (9 credits)

1. Advanced Criminology - CJ 703
2. Criminal Justice Policy - CJ 709
3. Introduction to College Teaching - Hum 702

Research Skills (15 credits)

1. Advanced Criminal Justice Methods - CJ 734
2. Applied Statistics - Stat 725
3. Applied Regression and Analysis of Variance - State 726 (Note: Stat 725 is a prerequisite for this course)
4. Program Evaluation - CJ 702

Substantive Areas - Students must complete four courses in substantive area of choice (12 credits) plus complete one course (6 credits) in each of their non-substantive areas (Total 18 cr.).

Substantive Area A - Criminology

1. Delinquency - CJ 606
2. Violence - CJ 750
3. Criminogenic Commodities - CJ 752

4. Individual Theories of Crime - CJ 721
5. Structural Theories of Crime - CJ 722

Substantive Area B - Corrections

1. Corrections - CJ 661
2. Crime Prevention - CJ 765
3. Community Corrections - CJ 762
4. Juvenile Corrections - CJ 707
5. Correctional Rehabilitation - CJ 763

Substantive Area C - Policing

1. Criminalization - CJ 660
2. Administrative Policing - CJ 755
3. Community Policing - CJ 757
4. Police and Race Issues - CJ 760
5. Police Effectiveness - CJ 761

Electives (15 cr.)

1. Deviant Behavior - CJ 607
2. Gender and Justice - CJ 768
3. Qualitative Methods - SOC 700
4. Adolescent Development - CDFS 650
5. Experimental Methods - PSY 640
6. Experimental Social Psychology - PSY 670
7. Applied Survey Sampling - STAT 660
8. Meta-Analysis Methods - STAT 665

Dissertation (1-15 Credits)

MS Degree in Criminal Justice

Admission Requirements

Students will need to enter the program with a baccalaureate degree. Students will be required to have had one course in research methods, one course in statistics, and should document

adequate background preparation or demonstrated potential in the field of Criminology or Criminal Justice. For admission to full-standing, students are required to achieve a minimum grade point average of 3.0 over their last 60 credit hours.

Degree Requirements

Students will need to declare their choice of a Track by the end of their first semester in the program. Both Tracks require the completion of the following 5 Foundation Courses (15 Credits total)

Advanced Criminology
Criminal Justice Policy
Program Evaluation
Applied Statistics
Advanced Criminal Justice Methods

In addition to the Foundation Courses, students enrolled in the **Applied Track** must complete 1 course from each of the following 3 areas (9 credits total).

I. Corrections

1. Corrections
2. Community Corrections
3. Crime Prevention
4. Correctional Rehabilitation
5. Juvenile Corrections

II. Policing

1. Criminalization
2. Administrative Policing
3. Community Policing
4. Police Effectiveness
5. Police and Race Issues

III. Management-Related

1. Organizational Psychology
2. Legal/Social Environment of Business

3. Organizational Communication I
4. Human Resource Management

In addition to the Foundation Courses, students enrolled in the **Criminology Track** must complete 1 course from the Theory area (3 credits total) and 2 courses from the Elective Area (6 credits total).

I. Theory

1. Individual Theories of Crime
2. Structural Theories of Crime

II. Electives

1. Crime and Delinquency
2. Violence
3. Criminogenic Commodities
4. Deviant Behavior
5. Advanced Psychopathology

Developmental Science

Program and Application Information

Department Head: Dr. James Deal

Graduate Coordinator: Dr. Joel Hektner

Department Location: Evelyn Morrow Lebedeff Hall

Email: **Joel.Hektner@ndsu.edu**

Telephone Number: (701)231-8268

Degree(s) Offered: Ph.D.

Application Deadline: February 1 Applications received after the deadline will be considered on a space-available basis.

Test Requirements

GRE verbal and quatitative scores of at least 600 each

English Proficiency Requirements

TOEFL ibT 100 (subscores of at least 24 for speaking and 21 for writing)

IELTS 7

Program Description

Developmental Science is an emerging approach to the study of human development that combines elements of more traditional approaches from the fields of Developmental Psychology and Human Development. Developmental Science entails the study of human development across the lifespan, integrating the biological, cognitive, and socioemotional underpinnings of development, and incorporating the familial, social, institutional and cultural contexts in which development occurs.

Program Objectives

The purpose of the program will be to train doctoral students in Developmental Science. The program requires coursework and activities that will produce professionals with strong skills in research, teaching, and service who will be competitive on the

Core Faculty

James E. Deal, Ph.D.
University of Georgia, 1987
Research Interests:
Personality Development in Children; Research Methods

Margaret Fitzgerald, Ph.D.
Iowa State University, 1997
Research Interests:
Birth-timing & Economic Outcomes; The Interface Between Family Business & The Family

Heather Fuller-Iglesias, Ph.D.
University of Michigan, 2009
Research Interests:
Social Support and Family Dynamics Across the Lifespan; Psychosocial Aging; Cultural Contexts

Joel Hektner, Ph.D.
University of Chicago, 1996
Research Interests:
Alcohol/Drug Abuse Prevention; Delinquency; Peer Affiliation Patterns/ Influences on Behavior

Brandy A. Randall, Ph.D.
University of Nebraska-Lincoln, 2002
Research Interests:
Prosocial & Moral Development; Relationships; Positive/Problem Behaviors

Elizabeth Blodgett Salafia, Ph.D.
University of Notre Dame, 2008
Research Interests:
Family and Peer Influences on Adolescents' Disordered Eating Attitudes and Behaviors

job market. These professionals will have a strong, interdisciplinary understanding of developmental science that will enable them to assume positions of leadership in research, teaching, and community and government agencies.

Specific program objectives are as follows:

1. Students will acquire marked ability, knowledge, and research skills in developmental science.
2. Students will conduct original research in developmental science.
3. Students will acquire the ability to be effective teachers.
4. Students will be prepared to be professionals in developmental science.

Program Delivery

The program will be delivered through traditional means, and students will be expected to be in residence at NDSU throughout the duration of the program. Although course instructors may incorporate online or hybrid delivery designs into their courses, the primary mode of instruction will be in small face-to-face classes and in one-on-one mentorship. Upon completion of coursework and in exceptional circumstances, students whose faculty advisors and committee members agree to work with them at a distance may be able to move elsewhere if necessary while completing the dissertation. In that case, the student and relevant faculty would need to mutually agree on a communication plan.

Program Requirements

Curriculum for students entering with a Bachelor's degree (90 credits total)

All courses 3 credits unless otherwise noted.

- Students may opt to complete the program with or without earning the Master's degree.

Cynthia Torges, Ph.D.
University of Michigan, 2006
Research Interests: Personality development and well-being in middle and late adulthood

Rebecca Woods, Ph.D.
Texas A&M University, 2006
Research Interests:
Perception and cognition in infancy; object processing; multimodal processing; early gender differences

Affiliated Faculty with in HDFS

Kristen Benson, Ph.D.
Virginia Polytechnical Institute and State University, 2008
Research Interests:
Gender Identity and Family/Partner Relationships, Diversity Issues in Family Therapy, Collaborative Approaches to Family Therapy Education and Training, and Qualitative Methodology

Sean Brotherson, Ph.D.
Oregon State University, 2000
Research Interests:
Parenting; Family Life Education

Christie McGeorge, Ph.D.
University of Minnesota, 2005
Research Interests:
Family Caregiving; Family Wellness; Premarital Counseling

Debra Pankow, Ph.D.
South Dakota State University, 2002
Research Interests:
Financial Decision-Making; Women's Economic Issues; Youth Financial Literacy

- Students will be evaluated after the second year. Any who is deemed unfit to continue to the Ph.D. would be allowed to complete the Masters.

Didactic Courses (34 credits total)

HDFS 701 Graduate Orientation (1 credit)
HDFS 702 College Teaching in Developmental Science
HDFS 703 Research Methods
HDFS 705 Quantitative Methods in Developmental Science
PSYC 762 Advanced Research Methods and Analysis (or HDFS 756*)
HDFS 758 Longitudinal Research Methods and Analysis
HDFS 782 Advanced Human Development: Birth through Childhood
HDFS 784 Advanced Human Development: Adolescence through Early Adulthood
HDFS 786 Advanced Human Development: Middle through Late Adulthood

Two courses from this list:

HDFS 724 Topics in Psychosocial Development
HDFS 725 Topics in Cognitive Development
PSYC 686 Neuropsychology
HDFS 726 Topics in Biological Approaches to Development*
One other elective course at 700-level or above (to be approved by committee)

Non-didactic Courses (20 credits total)

HDFS 790 Developmental Science Colloquium, to be taken 8 semesters (1 credit each)
HDFS 796 Readings and Research in Developmental Science (12 credits total)
The first 4 semesters are 2 credits each. The next 4 semesters are 1 credit each.

Thomas Carlson, Ph.D.
Iowa State University, 2000
Research Interests:
Family Therapy Training & Supervision; Fathering

Affiliated Faculty outside of HDFS

Ardith Brunt, Ph.D., Associate Professor (Health, Nutrition and Exercise Science
Ann Burnett, Ph.D., Associate Professor (Women's Studies)
Donna Grandbois, Ph.D., Assistant Professor (Nursing)
Daniel Klenow, Ph.D., Professor (Sociology)
Linda Langley, Ph.D., Associate Professor (Psychology)
Judy Pearson, Ph.D., Professor (Communications)
Susan Ray-Degges, Ph.D., Associate Professor (Apparel, Design and Hospitality Management)
Larry Reynolds, Ph.D., Professor (Animal Sciences)
Greg Sanders, Ph.D., Professor and Associate Dean, Human Development & Education
Kevin Thompson, Ph.D., Professor (Criminal Justice and Political Science)
Wendy Troop-Gordon, Ph.D., Assistant Professor (Psychology)
Kim Vonnahme, Ph.D., Assistant Professor (Animal Sciences)
Rachelle Vettern, Ph.D., Assistant Professor (Center for 4-H Youth Development)

Research Credits (36 credits total)

HDFS 793 Individual Study (research) (15 credits)

One of the following:

HDFS 798 Master's Thesis (6 credits)

HDFS 793 Individual Study (research) (6 credits), culminating in a submitted article

HDFS 799 Dissertation (15 credits)

Curriculum for students entering with a Master's degree (60 credits total)

All courses 3 credits unless otherwise noted.

Didactic Courses (22 credits total)

HDFS 701 Graduate Orientation (1 credit)

HDFS 702 College Teaching in Developmental Science

PSYC 762 Advanced Research Methods and Analysis (or HDFS 756*)

HDFS 758 Longitudinal Research Methods and Analysis

Four more didactic 700-level courses; one could be outside of HDFS (to be approved by committee)

Non-didactic Courses (11 credits total)

HDFS 790 Developmental Science Colloquium, to be taken 5 semesters (1 credit each)

HDFS 796 Readings and Research in Developmental Science (6 credits total) First semester is 2 credits. Four more semesters are 1 credit each.

Research Credits (27 credits total)

HDFS 793 Individual Study (research) (12 credits)

HDFS 799 Dissertation (15 credits)

Other requirements

1. Teach one undergraduate course, with supervision (as part of assistantship or for course credit in HDFS 794). Must have first taken HDFS 702.
2. Submit at least four proposal/abstracts for presentations or posters at national conferences, including as a co-presenter (2 submissions if enter with MS)
3. Present (in person) at least twice at national conferences (once if enter with MS), unless a waiver is granted by the student's committee.

4. Submit at least two peer-reviewed articles for publication (including as co-author), not including the article done in lieu of Master's Thesis, if chosen Note: Although these presentation and publication requirements do not carry course credit per se, they are projects that would be worked on as part of CDFS 793, CDFS 796, and/or CDFS 799.
5. Comprehensive/preliminary examination: format to be determined by student's committee

   Options

   - Traditional essay examination over several days
   - Write a Psychological Bulletin-type review article
   - Write a grant proposal to NIH or NSF
   - A portfolio including publications, presentations, teaching materials, etc.
6. Dissertation: format to be determined by student's committee.

Electrical and Computer Engineering

Program and Application Information

Interim Department Chair: Dr. Jacob Glower

Graduate Coordinator: Dr. Rajesh Kavasseri

Email: **Rajesh.Kavasseri@ndsu.edu**

Department Location: 101 Electrical Engineering Building

Telephone Number: (701)231-7019

Degree(s) Offered: Ph.D., M.S.

Application Deadline: March 1 (Department only admits for fall semester)

Test Requirements

GRE

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

To qualify for teaching assistantship

TOEFL ibT 100

IELTS 7

Program Description

The Department of Electrical and Computer Engineering offers graduate programs in selected specialty areas leading to the M.S. and Ph.D. in Electrical and Computer Engineering. Current departmental research expertise falls into one of the following areas: Signal Processing Group, Biomedical Engineering, Power/Power Electronics, Integrated Circuit, Electromagnetics, and Computer Engineering. The ECE Department is also a key contributor to NDSU's Research and Technology Park.

Graduate Faculty

Jacob Glower, Ph.D.
The Ohio State University, 1988
Research Interests:
Control Systems, Digital Systems

Cristinel Ababei, Ph.D.
University of Minnesota, 2004
Research Interests:
CAD for VLSI and FPGA Circuits

Benjamin Braaten, Ph.D.
North Dakota State University, 2009
Research Interests:
Electromagnetics

Roger Green, Ph.D.
University of Wyoming, 1998
Research Interests:
Signal Processing, Array Processing, Time-frequency Analysis

Rajendra Katti, Ph.D.
Washington State University, 1991
Research Interests:
Computer Architecture, Parallel Processing

Rajesh G. Kavasseri, Ph.D.
Washington State University, 2002
Research Interests:
Power Systems, Nonlinear Dynamics, Renewable Energy resources

Admissions Requirements

Admissions to the ECE program is on a competitive basis based upon the student's GRE scores, grade point average, and area of interest. Students who have graduated from an accredited electrical and computer engineering program in the United States with a B or better are encouraged to apply. Students with less than a B average may, under certain circumstances, be admitted on a conditional basis. Graduates from programs other than electrical and computer engineering--such as mathematics, physics, and other engineering areas--may be admitted if their average is B or better. However, they must satisfy or prove proficiency in the electrical and computer engineering undergraduate curriculum in effect at the time of matriculation. Normally, this means completing some undergraduate courses before pursuing graduate study. Some students may be able to take graduate and undergraduate courses at the same time. Students in this category should contact the department's graduate coordinator for specific details concerning their individual cases.

Academic Good Standing

All graduate students must maintain a 3.00 GPA or better and make significant progress towards their degree to remain in good standing. Failing to do either may hinder the student's financial assistance and/or ability to register for courses in the ECE graduate program.

Financial Assistance

The department has a limited number of both teaching and research assistantships available. These assistantships provide a monthly salary during the academic year, a waiver of graduate tuition during the academic year and summer, but do not cover the minimal activity fee. In addition, there are opportunities, both

Samee U. Khan, Ph.D.
University of Texas, Arlington 2007
Research Interests:
Autonomous Distributed Computing and Communication Systems

Hongxiang Li, Ph.D.
University of Washington, 2008
Research Interests:
Communications and Networking

Ivan T. Lima Jr., Ph.D.
University of Maryland, Baltimore County, 2003
Research Interests:
Photonics

V.V.B. Rao, Ph.D.
I.I.T., Madras, 1970
Research Interests:
Circuits, Digital Systems

David A. Rogers, Ph.D.
University of Washington, 1971
Research Interests:
Microwave Engineering, Electromagnetics, Fiber Optics

Mark Schroeder, Ph.D.
University of Texas, Austin, 1999
Research Interests:
Biomedical Engineering

Sudarshan Srinivasan, Ph.D.
Georgia Institute of Technology, 2007
Research Interests:
Computer Engineering

Chao You, Ph.D.
Rensselaer Polytechnic Institute, 2005
Research Interests:
VLSI

in the department and on the campus, to perform part-time work as graders, teachers, tutors, and consultants. These assistantships are awarded on a competitive basis -- typically at the time of admission for fall semester.

Subbaraya Yuvarajan, Ph.D.
I.I.T., Madras, 1981
Research Interests:
Power Electronics

Degree Requirements

The Master of Science degree requires a minimum of 30 semester credits beyond the B.S. degree. For the paper or thesis options, 6 hours of the 30 must be assigned to the thesis while a maximum of 3 credits are assigned to the paper. All students must pass a final oral examination covering both course work, and the thesis or paper.

The Doctor of Philosophy degree requires a minimum of 90 credits beyond the baccalaureate with an overall GPA of 3.0 or higher. Of these 90 credits, 30-40 credits may be assigned to the student's dissertation. The remainder must comprise of at least 36 credits in course work as chosen by the student and his/her supervisory committee. These must include two required courses: (ECE 702: Advanced Research Topics, 3 credits; ECE 703: Advanced Teaching and Classroom Topics, 3 credits).

Research Facilities and Equipment

The department is housed in a modern, well-equipped building. Graduate students have access to laboratories, instrument rooms, and computer services ranging from the university computer system to departmental computers. Research facilities include cardiovascular engineering lab, computer architecture lab, digital systems lab, EMI shield room, power and power electronics lab, signal processing and systems lab, and printed circuit lab.

Ph.D. in Engineering Requirements

In addition to the Ph.D. in Electrical and Computer Engineering, NDSU offers a Ph.D. in Engineering. This Ph.D. program is characterized as an interdisciplinary approach to engineering. A doctoral program for all engineering disciplines provides electrical and computer engineering students with general engineering knowledge and with in-depth understanding of one major specialty area, electrical engineering. The Ph.D. degree requires a minimum of 90 semester credits beyond the B.S. degree. Of these, 24 to 54 credits are to be in an area of concentration, 12 to 30 credits are from cognate and minor areas, and 30 to 40 credits comprise the doctoral dissertation. Students are required to pass a written qualifying examination on course work and a preliminary oral examination to qualify for Ph.D. candidacy. A final oral examination, primarily concerned with research work, is taken after the candidate has completed all course work and the dissertation.

Emergency Management

Program and Application Information

Department Chair: Dr. Daniel Klenow

Department Location: 107 Reinke Visual Arts Gallery

E-mail Address: daniel.klenow@ndsu.edu

Telephone Number: (701) 231-8657

Degree(s) Offered: Ph.D., M.S.

Application Deadline: February 15 for upcoming academic year

Test Requirements

GRE (required without an M.S. degree)

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Emergency Management program is multidisciplinary and is geared both to the academic disaster research curricula and the applied aspects of emergency management. The program is built on a core of social science courses to help students approach the study of disasters and emergency management from a social science perspective. Additionally, the program draws from other disciplines that enhance the development of processes and techniques to prevent disasters and to manage emergencies. The master's and doctoral degree programs in emergency management are organized around the three following areas: core courses, disaster phase courses, and disaster area studies. Core courses include methods, statistics, and theory. Disaster phase courses cover preparedness, mitigation, response, and recovery. Disaster area studies include the following subtopics: social and behavioral sciences, disaster types, the emergency manager, and the public and private sector responses to

Faculty

Carol Cwiak, J.D., Ph.D.
Western State University, 1995
North Dakota State University, 2009
Research Interests: Preparedness and Mitigation, Business Continuity, Law and Emergency Management

Gary A. Goreham, Ph.D.
South Dakota State University, 1985
Research Interests:
Rural Sociology, Community Assessment and Development , Research Methods, Environment/Natural Resources

Daniel J. Klenow, Ph.D.
University of Notre Dame, 1977
Research Interests:
Special Populations, International Disasters, Emergency Management Theory and Methodology

Richard W. Rathge, Ph.D.
Michigan State University, 1981
Research Interests:
Demography, Applied Sociology, Rural Sociology, Research Methods

Joy Sather-Wagstaff, Ph.D.
University of Illinois-Urbana-Champaign, 2007
Research Interests:
Disaster and Culture, Recovery and Commemorative

emergencies.

Admissions Requirements

Students can be admitted to our graduate program with either a baccalaureate degree (for admission to the master's program) or with an approved master's degree (for admission to the doctoral program). For admission in full standing to the master's program, students will be required to have a GPA of 3.2 or higher in their undergraduate *major and a 3.0 overall.* *The GRE is required for all applicants .* Applicants must submit their undergraduate and/or graduate transcripts. Students should have adequate background preparation or demonstrated potential in the field of emergency management.
For admission to the doctoral program in full standing, students must satisfy the admission requirements for the master's degree and have a masters degree in emergency management or a related field. Students entering the program with a master's degree will be required to complete a minimum of 60 credits.
The application process for Master's or Doctoral level studies is as follows:

1. Complete the application form on the Graduate School webpage and submit the required materials. The deadline for submitting application materials is February 15th for the upcoming academic year.
2. Request letters of reference in support of your application. Letters from faculty who have had you in undergraduate or graduate classes are preferred.
3. All master's and doctoral applicants must submit GRE scores. Specific GRE discipline tests are not required. GRE scores are required for admission to the Emergency Management program because they provide another perspective on a student's academic abilities. At this time, no specific score totals are used as a cutoff. Applications are evaluated holistically using all indicators of student aptitude for successful graduate study in this program.

Dong Keun (D.K.) Yoon, Ph.D.
Cornell University, 2007
Research Interests:
Planning, Emergency Management, Geographic Information Systems (GIS)

George A. Youngs, Ph.D.
University of Iowa, 1981
Research Interests:
Social Psychology, Research Methods, Sociology of Disasters, Emergency Management

4. Submit electronic copies of two academic papers that you have written to: Daniel J. Klenow, Ph.D., Professor and Chair, Department of Emergency Management (daniel.klenow@ndsu.edu). The papers do not have to focus on emergency management or disasters, but must be research papers written in English. Writing samples are used to gain information on the student's writing style and ability to write research-based papers. Papers submitted in support of an application would ideally be eight or more pages in length. In addition, to meet the objective of the admission criteria the paper must be a research paper that employs formal citiations. Papers will most typically be library-based research papers but papers based on original data gathering are also encouraged. The latter might be more likely to come from an applicant with a master's degree.
5. Master's and doctoral applicants meeting the aforementioned criteria for admission will participate in a conference call interview with two or more of the program faculty. Applicant interviews are designed to provide two-way communication between the faculty and prospective applicant. The faculty will ask questions but we also want the applicant to pose questions about the program and our educational objectives. The interview should assist the student and faculty to test the goodness of fit between the program and the applicant. Interviews will assess the applicant's ability to engage in evidence-based reasoning.

We are most likely to accept doctoral applicants who demonstrate knowledge of the concepts discussed in the books on our Master's Reading List in their interview.

The emergency management program at NDSU believes that the best doctoral degree program in emergency management will be made up of a diverse student body. We welcome applicants to our doctoral degree program with Master's degrees from a variety of disciplines; students from all countries; students with different professional backgrounds; and, students with varying goals and interests. We want to ensure however that students entering our program are knowledgeable about emergency management and some of the literature that provides the foundation for our discipline. Therefore, when applicants are interviewed during the application process, we expect that the best candidates will demonstrate their familiarity with the major concepts presented in the books on the reading list.

By asking our potential doctoral students to enter our program with foundational knowledge of the emergency management literature we hope to accomplish several goals. First, in reading the books on the reading list, prospective students will be able to confirm their desire to pursue a doctoral education in the discipline of emergency management. Second, we assume that students who undertake this reading in preparation for their application interview will be bright and motivated students who are passionate about the study of emergency management--exactly the type of students we want to be a part of our doctoral student cohort. Third, and finally, a basic understanding of the emergency management literature will help students coming into our program from a variety of backgrounds succeed once they begin their studies at NDSU.

All students are automatically considered for graduate assistantships so no separate application process is required for such consideration.

Financial Assistance

Both teaching and research assistantships are available contingent on departmental and faculty research funds. All applicants are considered for funding unless they request otherwise. Awards are based on past academic and professional performance. The review process is highly competitive.

Degree Requirements for M.S. Degree

Successful completion of a master's degree in emergency management will involve completion of all of the required course work plus a research-based master's thesis. The total required credits is 36.

The requirements for the master's degree in emergency management are as follows:

All students must

1. **Core:** Complete all courses (12 credits)
   SOC 723: Social Theory
   SOC 700: Qualitative Methods *or* SOC 701: Quantitative Methods
   EMGT 720: Emergency Management Theory
   EMGT 653: Emergency Management Law and Regulation

2. **Disaster Phases:** Complete at least one course from each of the following four Disaster Stages (12 credits). Courses should be taken in the order listed. Courses taken at the undergraduate level (400) cannot be retaken at the graduate level (600).
    1. **Preparedness**

        EMGT 611: Community Disaster Preparedness

        EMGT 712: Hazards Risk Assessment Theory and Practice
    2. **Mitigation**

        EMGT 613: Building Disaster Resilient Communities

        EMGT 721: Hazard Mitigation Theory and Practice
    3. **Response**

        EMGT 631: Disaster Response Operations and Leadership

        EMGT 732: Disaster Response Theory and Practice
    4. **Recovery**

        EMGT 683: Holistic Disaster Recovery

        EMGT 782: Damage Recovery Theory and Practice
3. **Disaster Area Studies - Social and Behavioral Sciences:** Select one course from each area (6 credits). Courses taken at the undergraduate level (400) cannot be retaken at the graduate level (600).
    1. **Social Structure, Social Institutions, and Social Processes**

        EMGT 681: Disaster Analysis

        SOC 605: Community Development

        SOC 626: Sociology of Medicine

        SOC 641: Sociology of Death

        SOC 631: Environmental Sociology
    2. **Social and Cultural Context of Disasters**

        SOC 610: Social Inequality

        SOC 643: International Disasters

        SOC 645: Special Populations & Disasters

        ANTH 658: Indians of the Great Plains

        ANTH 661: Germans from Russia

        ANTH 662: Cultural Ecology
4. **Disaster Area Studies - The Public and Private Sector:** Select one course (3 credits)

    EMGT 661: Business Continuity & Crisis Management

    EMGT 663: Voluntary Agency Disaster Services

COMM 683: Organizational Communication I

BUSN 630: Legal and Social Environment of Business

5. **Practicum:** (6 credits)

   EMGT 795: Emergency Management Practicum

6. **Thesis** (6 credits)

TOTAL = 45 credits

Degree Requirements for Doctor of Philosophy Degree

The Ph.D. is awarded in recognition of significant depth of understanding and scholarly achievement in emergency management. The recipient must complete all of the required course work (see Ph.D. requirements below), pass written comprehensive exams, complete a significant research project for the dissertation, and successfully defend this research in an oral examination. The student's progress will be reviewed by a supervisory committee that is responsible for reviewing the student's plan of study, written comprehensive examinations, dissertation proposal, and dissertation defense. The composition of the supervisory committee will meet the requirements established by The Graduate School. The program will require a minimum of 90 credits or 60 credits beyond the master's degree. The master's degree must be completed before pursuing the doctoral degree.

The structure of the doctoral program follows the same logic as that used for the master's degree. The courses are organized around the four disaster stages and the various disaster studies subfields. As part of disaster area studies, students will be required to complete two cognates, one in sociology and one in a second field approved by the student's supervisory committee. These cognates require a minimum of 12 credits each. The dissertation will be worth 15 credits.

All students must

1. **Core:** Complete all courses (18 credits)

   SOC 723: Social Theory

   SOC 700: Qualitative Methods

   SOC 701: Quantitative Methods

   EMGT 720: Emergency Management Theory

   EMGT 730: Advanced Research Methods

   EMGT 653: Emergency Management Law and Regulations

2. **Disaster Phases:** Complete at least two courses from two of the following four Disaster Stages and one course from each of the remaining two Disaster Stages (18 credits). Courses should be taken in the order listed. Courses taken at the undergraduate level (400) cannot be retaken at the graduate level (600).
    1. **Preparedness**

        EMGT 611: Community Disaster Preparedness

        EMGT 712: Hazards Risk Assessment Theory and Practice

        GEOG 656: Geographic Information Systems
    2. **Mitigation**

        EMGT 613: Building Disaster Resilient Communities

        EMGT 721: Hazard Mitigation Theory and Practice

        POLS 653: Environmental Policy and Politics
    3. **Response**

        EMGT 631: Disaster Response Operations and Leadership

        EMGT 732: Disaster Response Theory and Practice

        COMM 785: Advanced Crisis Communication
    4. **Recovery**

        EMGT 683: Holistic Disaster Recovery

        EMGT 782: Damage Recovery Theory and Practice

        ECS 760: Environmental Impact Assessment
3. **Disaster Area Studies - Social and Behavioral Sciences:** Select three courses from each area (18 credits). Courses taken at the undergraduate level (400) cannot be retaken at the graduate level (600).
    1. **Social Structure, Social Institutions, and Social Processes**

        EMGT 681: Disaster Analysis

        SOC 605: Community Development

        SOC 626: Sociology of Medicine

        SOC 641: Sociology of Death

        SOC 631: Environmental Sociology
    2. **Social and Cultural Context of Disasters**

        SOC 610: Social Inequality

        SOC 643: International Disasters

        SOC 645: Special Populations & Disasters

        ANTH 658: Indians of the Great Plains

ANTH 661: Germans from Russia

ANTH 662: Cultural Ecology

4. **Disaster Area Studies - The Public and Private Sector:** Select one course (3 credits)

   EMGT 661: Business Continuity & Crisis Management

   EMGT 663: Voluntary Agency Disaster Services

   COMM 683: Organizational Communication I

   BUSN 630: Legal and Social Environment of Business

5. **Practicum:** (9 credits)

   EMGT 795: Emergency Management Practicum

6. **Electives:** (9 credits)

   Courses may include didactic courses, seminars, independent study and/or field research.

7. **Thesis** (6 credits)
8. **Dissertation** (15 credits)

TOTAL = 96 credits

Engineering Ph.D.

Program and Application Information

Dean: Dr. Gary Smith

Department Location: Engineering Administration Building

Telephone Number: (701) 231-7028

Degree(s) Offered: Ph.D.

Application Deadline: March 15, but applications are considered year-round

Test Requirements

GRE (required for International applicants; recommended for domestic applicants)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Doctor of Philosophy in Engineering program is designed to provide the engineering student with a unique opportunity to contribute to the advancement of the engineering profession.

The program addresses the engineering profession's need for mature minds that can translate basic knowledge into practical solutions to the engineering problems associated with our rapidly changing environment. This is accomplished through a unique integration of engineering science within a basic area of concentration.

The Ph.D. program is characterized by an interdisciplinary approach to engineering. A single doctoral program for agricultural and biosystems engineering, civil engineering, electrical and computer engineering, industrial and manufacturing engineering, and mechanical engineering

Faculty

Iskander Akhatov, Ph.D.
Lomonosov University of Moscow, USSR, 1983
Research Interests:
Dynamics of bubbles, bubble clouds and bubbly liquids

Donald A. Andersen, Eng.D.
Texas A & M University, 1982
Research Interests:
Transportation

John R. Cook, Ph.D.
Purdue University, 1991
Research Interests:
Human Factors, Design of Man-Machine Systems, Management of Technology

Kambiz Farahmand, Ph.D.
University of Texas at Arlington, 1992
Research Interests:
Adverse environment protecting garment, thermal physiology, cooling systems, hypothermia, and respiratory heat and mass transfer

David C. Farden, Ph.D.
Colorado State University, 1975
Research Interests:
Signal Processing

Dinesh Katti, Ph.D.
University of Arizona, 1991
Research Interests:
Geotechnical

provides students with both general knowledge and in-depth understanding of one major area of concentration. Students are able to develop individualized programs of study that emphasize different areas of interest.

Each individualized program consists of three functional areas. The first, the cognate and minor area, includes course work considered to be of special importance to the student's future progression in any of the other areas. Second is the concentration area, including courses contributing to a specialization area. The student's dissertation makes up the third segment of the Ph.D. program.

Admissions Requirements

The Ph.D. program in Engineering is open to qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree and preferably a master's degree from an educational institution of recognized standing.
2. Have adequate preparation in engineering, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. Have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent at both the baccalaureate level and the graduate level.

Financial Assistance

Applicants must first be admitted to the Graduate School to become eligible for consideration for an assistantship. Both research and teaching assistantships are available to qualified students. Applicants are considered on the basis of scholarship

Kalpana Katti, Ph.D.
University of Washington, Seattle, 1996
Research Interests:
Biomedical engineering, polymer materials

Eakalak Khan, Ph.D.
University of California at Los Angeles, 1997
Research Interests:
Biodegradable Solid Wastes, Industrial Wastes

Charles McIntyre, Ph.D.
Pennsylvania State University, 1996
Research Interests:
Construction, CAD

Sudhir I. Mehta, Ph.D.
I.I.T., Bombay, 1982
Research Interests:
Mechanical, Instrumentation, Controls, Data Acquisition, Robotics

G. Padmanabhan, Ph.D.
Purdue University, 1980
Research Interests:
Civil Engineering, Water Resources

David A. Rogers, Ph.D.
University of Washington, 1971
Research Interests:
Microwave Engineering, Electromagnetics, Fiber Optics

Gary Smith, Ph.D.
Purdue University, 1986
Research Interests:
Quality Control, Decision Analysis and Modeling Techniques, Digital Imaging in Construction

and potential to undertake advanced study and research.

To be considered for an assistantship, a completed Graduate School application, official transcripts, and three letters of reference must be submitted to the Graduate School no later than March 15. International students must also submit a TOEFL score as well as GRE general test scores. The GRE scores are preferred but not required for domestic students.

Degree Requirements

The Doctor of Philosophy in Engineering program requires the completion of 90 credit hours of graduate study beyond the baccalaureate degree with an overall GPA of 3.0 or higher. The total credit hours are made up of 12 to 30 credit hours in the cognate and minor area, 24 to 54 credit hours in the area of concentration, and 30 to 40 credit hours of a research-based dissertation.

A preliminary comprehensive written examination and oral examination are required of the student after completion of the greater portion of the course work phase of the Ph.D. program. The comprehensive written portion is based on course work questions submitted by appropriate faculty. During the oral examination, the student presents a research proposal for dissertation research. After passing this exam, the student is formally admitted as a candidate for the Ph.D. degree.

The final examination, primarily concerned with research work, is taken after the candidate has completed all course work and the dissertation. The dissertation must show originality and demonstrate the student's capacity for independent research. It must embody results of research constituting a definitive contribution to knowledge.

Dean D. Steele, Ph.D.
University of Minnesota, 1991
Research Interests:
Irrigation, Environmental Engineering

Amiy Varma, Ph.D.
Purdue University, 1993
Research Interests:
Transportation Systems, Traffic Engineering Airports, Infrastructure Management

David L. Wells, Ph.D.
University of Missouri-Rolla, 1996
Research Interests:
Materials and Process Engineering, Manufacturing Operations

Dennis D. Wiesenborn, Ph.D.
Rice University, 1989
Research Interests:
Food and Value Added Process Engineering

Frank Yazdani, Ph.D.
University of New Mexico, 1987
Research Interests:
Civil Engineering, Structures

Subbarayo Yuvarajan, Ph.D.
I.I.T., Madras, 1981
Research Interests:
Power Electronics

For additional graduate faculty, see Agricultural and Biosystems Engineering, Civil Engineering, Electrical and Computer Engineering, Industrial and Manufacturing Engineering, and Mechanical Engineering.

Research Facilities

The PhD program in Engineering utilizes facilities and laboratories in agricultural and biosystems engineering, civil engineering, electrical and computer engineering, industrial and manufacturing engineering, and mechanical engineering. Laboratory facilities include a bio-medical engineering laboratory, an internal combustion laboratory, a hydraulics laboratory, an automatic manufacturing laboratory, the Center for Nanoscale Science and Engineering, and others.

English

Program and Application Information

Department Head: Dr. Dale Sullivan

Department Location: 219 Morrill Hall

Graduate Coordinator: Dr. Gary Totten

Email: gary.totten@ndsu.edu

Telephone Number: (701) 231-7143

Degree(s) Offered: M.A., Ph.D.

Application Deadline: To be considered for admission and a teaching assistantship, completed applications must be received at the Graduate School by February 1 for fall semester and November 1 for spring semester. Students seeking a teaching assistantship should apply for fall admission.

Test Requirements

GRE General Test

English Proficiency Requirements

TOEFL ibT 100

IELTS 7

Master of Arts

The Department of English, through its master's program, offers students the opportunity for intellectual growth and personal development; careers in diverse fields such as education, government, technical communication, law, public relations, theology, business; and studies leading to advanced degrees in such fields as English, law, creative writing, religious studies, and education.

Students may choose from two options within the masters in English: literature or composition. These options require Engl 760, Graduate Scholarship, normally taken during the student's first or second semester in residence. In providing an opportunity for wide-ranging career choices through the two options, the department emphasizes critical thinking as an essential

Graduate Faculty

Elizabeth Birmingham, Ph.D.
Iowa State University, 2000
Field: Rhetoric and Professional Communication, Gender Studies, Architectural History, Theory, and Criticism

Kevin Brooks, Ph.D.
Iowa State University, 1997
Field: Rhetoric and Professional Communication, Computers and Composition, Writing Program Administration

Muriel Brown, Ph.D.
University of Nebraska, 1971
Field: Medieval Literature, Modern Drama, Women's Studies

Linda L. Helstern, Ph.D.
Southern Illinois University-Carbondale, 2001
Field: Native American Literature, Modernism, Contemporary Poetry, Literature and the Environment

R.S. Krishnan, Ph.D.
University of Nebraska, 1981
Field: Restoration and 18th-Century British Literature, Postmodern Theories, British Novel, Postcolonial Literature

Andrew Flood Mara, Ph.D.
University of New Mexico, 2003
Field: Technical and Professional Communication, New Media, Rhetoric and Composition

approach to the writing of papers, the making of oral reports, and the study of language and literature.

Admissions Requirements

The Department of English graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. hold a baccalaureate degree from an educational institution of recognized standing;
2. have completed a major in English at the undergraduate level;
3. have a cumulative grade point average (GPA) of 3.0.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but demonstrate potential for graduate study, may be given conditional admission. Applications should be submitted directly to the Graduate School before February 1 of the upcoming academic year . Applications received after February 1 will be considered for the following academic year.

Financial Assistance

Teaching assistantships are available and are based on the applicant's scholastic record and letters of recommendation. However, the student must first make application to the Graduate School and be accepted for admission before she/he is eligible for an assistantship in the Department of English. Letters of application for teaching assistantships should be submitted at the same time as the application to the program is submitted to the graduate school and should specify experience and qualifications.

Miriam O'Kane Mara, Ph.D.
University of New Mexico, 2003
Field: Postcolonial Literature, Irish Modern and Contemporary Literature, British Victorian through Contemporary Literature

Bruce Maylath, Ph.D.
University of Minnesota, 1994
Field: International Technical Communication, Rhetoric and Composition, Linguistics

Robert O'Connor, Ph.D.
Bowling Green State University, 1979
Field: Romantic Literature, Science Fiction and Fantasy

Kelly Sassi, Ph.D.
University of Michigan, Ann Arbor, 2008
Field: English Education, Composition and Rhetoric, Native American Literatures, Culturally Responsive Pedagogy

Dale Sullivan, Ph.D.
Rensselaer Polytechnic Institute, 1988
Field: Rhetoric Theory and History, Rhetoric of Science, Rhetoric of Religion, Technical Communication

Amy Rupiper Taggart, Ph.D.
Texas Christian University, 2002
Field: Writing and Rhetoric, Pedagogy, Literacy Studies

Verena Theile, Ph.D.
Washington State University, Pullman, 2006
Field: 16th-/17th-Century Literature, Early Modern Drama, European Literature, Cultural Theory

Graduate students are awarded teaching assistantships for the academic year only. As of the 2009-2010 academic year, the annual stipend is $8,100. University graduate tuition charges (not fees) are waived for all TAs. Teaching Fellowships are available to selected TAs after completing course work. Moreover, the Department of English annually awards the Rooney Scholarship (2010: $1,220) and the Madeline S. Gittings Scholarship (2010: $1,000) to deserving graduate students.

Gary Totten, Ph.D.
Ball State University, 1998
Field: Late 19th-/Early 20th-Century American Literature, Travel Literature, Multi-Ethnic American Literature

Degree Requirements

The Master of Arts program offers the option of completing 27 credit hours of letter-graded course work with an overall GPA of 3.0 or better, and a 3-credit master's paper. A thesis-oriented plan of study is also available with variable credit hours of letter-graded course work. Completion of intermediate competency in one foreign language is required.

Within the first semester of graduate work, each student is assigned an academic adviser who helps in overseeing the student's course work and paper committee. Students who plan to pursue a Ph.D. after completing their M.A. degrees are encouraged to work closely with their respective advisers in choosing the courses which best prepare them for doctoral work. A graduate student in English should enroll in no more than 3 credits of Engl 793, Individual Study/Tutorial, during his/her master's career. Exceptions are provided for through a graduate form signed by the chair of the department and the adviser.

Literature Option

Students must

1. Complete Engl 760 Graduate Scholarship and Engl 762 Critical Theory.*
2. Complete 6 credits in British and 6 credits in American literature. At least three credits must be in pre-1900 American or pre-1660 British and at least three credits

must be in post-1900 American or post-1660 British. Three credits in multicultural or post colonial literature is recommended.

3. Complete one course (3 credits) in Composition** or Linguistics.
4. Complete two elective courses (6 credits), literature recommended.
5. Complete Engl 797 or 798 (Master's Paper or Master's Thesis).

Composition Option

Students must

1. Complete Engl 760 Graduate Scholarship.*
2. Complete two required courses: Engl 755 Composition Theory,* Engl 756 Composition Research.
3. Complete three electives in Composition.**
4. Complete one course each in Literature and Linguistics.
5. Complete one elective.
6. Complete Engl 797 or 798 (Master's Paper or Master's Thesis).

*Graduate students in any of the options are strongly advised to take Graduate Scholarship (Engl 760) and, as appropriate, Critical Theory (Engl 762) in their first year in the program. Students in the Composition Track planning to complete their course work in two years must take Composition Theory and Composition Research when they are offered, as those two core courses alternate.

**Engl 764 Classroom Strategies for TAs may be used to satisfy one Composition requirement.

English Practical Writing

Program and Application Information

Department Head: Dr. Dale Sullivan

Department Location: 219 Morrill Hall

Graduate Coordinator: Dr. Gary Totten

Email: gary.totten@ndsu.edu

Telephone Number: (701) 231-7143

Degree(s) Offered: Ph.D.

Application Deadline: Ph.D. applications are accepted for fall semester only. To be considered for admission and a teaching assistantship, completed applications must be received at the Graduate School by February 1. .

Test Requirements

GRE General Test

English Proficiency Requirements

TOEFL ibT 100

IELTS 7

Doctor of Philosophy

The English Ph.D. degree program is open to all qualified graduates of universities and colleges of recognized standing. The Ph.D. in English provides students with employable skills in the area of professional and technical communication. This innovative and regionally unique program invites students to work at the intersection of rhetorical, textual, and cultural studies. The number of positions available in technical communication significantly surpasses the number of new Ph.D.s produced each year by a sizable margin. Graduates from NDSU's program may pursue careers as:

- professors in universities or colleges;

Graduate Faculty

Elizabeth Birmingham, Ph.D.
Iowa State University, 2000
Field: Rhetoric and Professional Communication, Gender Studies, Architectural History, Theory, and Criticism

Kevin Brooks, Ph.D.
Iowa State University, 1997
Field: Rhetoric and Professional Communication, Computers and Composition, Writing Program Administration

Muriel Brown, Ph.D.
University of Nebraska, 1971
Field: Medieval Literature, Modern Drama, Women's Studies

Linda L. Helstern, Ph.D.
Southern Illinois University-Carbondale, 2001
Field: Native American Literature, Modernism, Contemporary Poetry, Literature and the Environment

R.S. Krishnan, Ph.D.
University of Nebraska, 1981
Field: Restoration and 18th-Century British Literature, Postmodern Theories, British Novel, Postcolonial Literature

Andrew Flood Mara, Ph.D.
University of New Mexico, 2003
Field: Technical and Professional Communication, New Media, Rhetoric and Composition

- training and development specialists, user-experience experts, and human-computer interaction specialists in industry;
- technical, scientific, or professional writers and editors in research and development organizations, high-tech companies, non-profit organizations, or government agencies.

Hands-on experience is essential to our program. The English Ph.D. requires six credits of experiential learning. Students can work with professors or mentors in disciplinary writing. Others opt to intern for non-profits or local industries.

NDSU offers opportunities for students in the Ph.D. program to teach discipline-specific writing, such as writing in the sciences, writing for engineers and writing in business and finance. Ph.D. students are eligible for Presidential Doctoral Graduate Fellowships.

To be admitted with full status to the program, the applicant must fulfill all of the requirements set out below.

Admissions Requirements

1. In most cases, applicants are expected to have completed a Master of Arts or Science, but exceptional candidates may be admitted directly out of the Bachelor's degree
2. Have completed a BA, BS, MA, or MS from an accredited educational institution.
3. Have a minimum cumulative grade point average (GPA) of 3.5.

Conditional admission may be granted to students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but demonstrate potential for graduate study. Such students may be required to take additional courses to address deficiencies in prerequisite course work.

Miriam O'Kane Mara, Ph.D.
University of New Mexico, 2003
Field: Postcolonial Literature, Irish Modern and Contemporary Literature, British Victorian through Contemporary Literature

Bruce Maylath, Ph.D.
University of Minnesota, 1994
Field: International Technical Communication, Rhetoric and Composition, Linguistics

Robert O'Connor, Ph.D.
Bowling Green State University, 1979
Field: Romantic Literature, Science Fiction and Fantasy

Kelly Sassi, Ph.D.
University of Michigan, Ann Arbor, 2008
Field: English Education, Composition and Rhetoric, Native American Literatures, Culturally Responsive Pedagogy

Dale Sullivan, Ph.D.
Rensselaer Polytechnic Institute, 1988
Field: Rhetoric Theory and History, Rhetoric of Science, Rhetoric of Religion, Technical Communication

Amy Rupiper Taggart, Ph.D.
Texas Christian University, 2002
Field: Writing and Rhetoric, Pedagogy, Literacy Studies

Verena Theile, Ph.D.
Washington State University, Pullman, 2006
Field: 16th-/17th-Century Literature, Early Modern Drama, European Literature, Cultural Theory

To be considered, completed applications should be received by February 1 directly to the Graduate School.

Official transcripts (transcripts having an appropriate seal or stamp) of all previous undergraduate and graduate records must be received by the Graduate School before the application is complete. When a transcript is submitted in advance of completion of undergraduate or graduate studies, an updated transcript showing all course credits and grades must be provided prior to the initial registration at North Dakota State University.
At least three letters of recommendation and a writing sample are required before action is taken on any application. Personal reference report forms are available from the Graduate School.

Applications must include:

- at least **3 letters of recommendation,** ideally addressing your abilities as a student and your potential for graduate work
- an academic **writing sample**, not to exceed 20 pages, that reflects the student's academic or professional interests and that demonstrates the student's critical and analytical abilities
- A **statement of purpose** that includes the following:
    - coursework you plan to complete in the program
    - faculty members with whom you wish to study
    - scholarship you plan to pursue
    - a sense of what you hope to do once you have completed a Ph.D. degree in English
    - how your education and/or life experience have prepared you for graduate work
- **official transcripts** from all previous undergraduate and graduate records

Verena Theile, Ph.D.
Washington State University, Pullman, 2006
Field: 16th-/17th-Century Literature, Early Modern Drama, European Literature, Cultural Theory

Gary Totten, Ph.D.
Ball State University, 1998
Field: Late 19th-/Early 20th-Century American Literature, Travel Literature, Multi-Ethnic American Literature

- when applicable, a **letter** stating your interest in and qualifications for a teaching assistantship.

Preferred additional materials:

- Practical and / or Professional writing sample not to exceed 10 pages

The TOEFL examination is required of all international applicants. A minimum score of 100 (internet test) 600 (paper test) or 243 (computer test) or a minimum of 7 on the IELTS is required of international students seeking admission with full standing.

Financial Assistance

Teaching assistantships are available and are based on the applicant's scholastic record and letters of recommendation. However, the student must first make application to the Graduate School and be accepted for admission before she/he is eligible for an assistantship in the Department of English. Letters of application for teaching assistantships should be submitted at the same time as the application to the program is submitted to the graduate school and should specify experience and qualifications.

Graduate students are awarded teaching assistantships for the academic year only. As of the 2009-2010 academic year, the annual stipend is $14,000. University graduate tuition charges (not fees) are waived for all TAs. Teaching Fellowships are available to selected TAs after completing course work. Moreover, the Department of English annually awards the Rooney Scholarship (2010: $1,220) and the Madeline S. Gittings Scholarship (2010: $1,000) to deserving graduate students.

Degree Requirements

The Ph.D. program requires 90 credits beyond the baccalaureate degree and a minimum of 60 graduate credits at NDSU. Students must take a minimum of 30 credits at the 700 level. Students admitted to the Ph.D. are required to demonstrate foreign language competency by the time they begin to write the dissertation. Students may meet this requirement in one of the following ways:

1. Demonstrate advanced reading competency in one foreign language equivalent to successful completion of a second-semester, third-year (300-level, 6th semester) college language course.

2. Demonstrate intermediate reading competency in two foreign languages equivalent to successful completion of two second-semester, second-year (200-level, 4th semester) college language courses.
3. Demonstrate intermediate reading competency in one foreign language equivalent to successful completion of a second-semester, second-year (200-level, 4th semester) college language course and, in consultation with the student's advisor and the graduate director, demonstrate competency in one special research skill (written rationale will be required at time of request).

See Graduate Handbook for additional information.

Within the first semester of graduate work, each student is assigned an academic adviser who helps in overseeing the student's plan of study. A graduate student in English should enroll in no more than 3 credits of Engl 793, Individual Study/Tutorial, during his/her graduate career. Exceptions are provided for through a graduate form signed by the chair of the department and the adviser.

Plan of Study

Students must

1. Complete 6 credits of Core courses, consisting of Engl 760 Graduate Scholarship, Engl 755 Composition Theory, and Engl 764 Classroom Strategies for TAs.*
2. Complete 6 credits in Research Methods courses, selected from Engl 762 Critical Theory, Engl 756 Composition Research, Communication 708 Advanced Qualitative Methods in Communication, Communication 767 Rhetorical Criticism, History 701 Methods of Historical Research, or Sociology 700 Qualitative Methods.
3. Complete 33 credits in Didactic Courses. 18 credits must be in Rhetoric and Writing courses (two courses must be from English and two from Communication) and 15 credits of Elective courses (any graduate-level class not listed elsewhere on the student's plan of study, approved by student's adviser).
4. Complete 24 credits in English studies courses (literature and linguistics). Students may transfer in graduate credits in this area or take English 600 and 700 level literature and linguistics classes not listed as part of the English Ph.D.

5. Complete 6 credits of Experiential Learning, including teaching mentorships, field experiences, and internships, inside or outside the academy in research, administrative, editing, consulting, or writing roles.
6. Complete Doctoral Comprehensive Exams when 72 credits are complete. The dissertation proposal is submitted after the successful completion of the comprehensive exams.
7. Complete Engl 799 (Doctoral Dissertation).

*Graduate students are strongly advised to take Core courses in their first year in the program or as soon as these courses are offered.

Entomology

Program and Application Information

Director: Dr. Donald Kirby, School of Natural Resource Sciences
Program Leader: Dr. Marion Harris
Department Location: Hultz Hall
Telephone Number: (701) 231-7582
Degree(s) Offered: Ph.D., M.S.
Application Deadline: International applications are due May 1 for fall semester and August 1 for spring semester. Domestic applicants should apply at least one month prior to the start of classes.

Requirements

TOEFL ibT 79
IELTS 6

Program Description

The Department of Entomology in the School of Natural Resource Sciences offers graduate study leading to the M.S. and Ph.D. degrees. Advanced work involves specialized training in the following areas: behavior, biochemistry, biodiversity, biological control, chemical ecology, ecology, host plant resistance, insect pathology, pest management, molecular genetics, physiology, and systematics. The Department also participates in interdisciplinary programs in Environmental and Conservation Sciences and Natural Resources Management.

The close working relationship between the Department and the USDA Red River Valley Agricultural Research Center, located on campus, provides students many opportunities for research and consultation. Students may conduct their research program under the direction of USDA scientists holding adjunct appointments in the Entomology.

Faculty

Mark A. Boetel, Ph.D.
South Dakota State University, 1996
Research Interests:
Integrated Pest Management of Sugarbeet and Corn Insects, Microbial Control

Laurence D. Charlet, Ph.D. (adjunct)
University of California-Riverside, 1975
Research Interests:
Sunflower Integrated Pest Management, Biological Control

Stephen P. Foster, Ph.D.
University of Waikato, 1983
Research Interests:
Insect Chemical Ecology, Pheromone Biochemistry, Reproductive Behavior

Jason P. Harmon, Ph.D.
University of Minnesota, 2003
Research Interests:
Environmental Change and Ecological Interactions, Biological Control, Insect Ecology

Marion O. Harris, Ph.D.
Michigan State University, 1986
Research Interests:
Insect Behavior, Insect-Plant Interactions, Resistance of Plants to Insects

Stefan T. Jaronski, Ph.D. (adjunct)
Cornell University, 1978
Research Interests:
Insect Pathology

Student research and academic programs are tailored to individual needs and interests. Interdisciplinary approaches to entomological programs are fostered. Prospective students are encouraged to check the Entomology web site (**http://www.ndsu.edu/entomology/prospective_students/**) for the latest descriptions of the graduate program.

Admissions Requirements

The Department of Entomology graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in entomology, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level or last graduate degree completed, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent.

Applications should be submitted directly to the Graduate School.

Conditional Admission

A student not meeting all admission requirements or having deficiencies in prerequisite course work who shows potential for graduate study may be admitted conditionally. A student admitted conditionally will be provided a statement of the conditions to be satisfied before advancement to full standing. The student may not earn more than 12 semester credit hours and must acheive a minimum grade of 3.0 per course as a conditional student. The request for change to full standing must be submitted to the Dean

Paul Johnson, Ph.D. (adjunct)
University of Wisconsin, 1992
Research Interests:
Insect systematics of click beetles

Dr. Don Kirby, Director
School of Natural Resource Sciences
North Dakota State University,
Fargo, ND 58105
701.231.7582
donald.kirby@ndsu.edu

William Kemp, Ph.D. (adjunct)
University of Idaho, 1984
Research Interests:
Rangeland/Wildlife Ecology, Bee Ecology

Janet J. Knodel, Ph.D.
North Dakota State University , 2005
Research Interests:
Integrated Pest Management

Roger Leopold, Ph.D. (adjunct)
Montana State University, 1967
Research Interests:
Insect Cryobiology

Ian V. MacRae, Ph.D. (adjunct)
Colorado State University, 1996
Research Interests:
Computer Applications in Entomology, Landscape Ecology, Insect Behavior

Paul J. Ode, Ph.D. (adjunct)
University of Wisconsin-Madison, 1994
Research Interests:
Insect Evolutionary and Behavior Ecology, Tritrophic Interactions

Denise L. Olson, Ph.D. (adjunct)
Kansas State University, 1994
Research Interests:
Biological Control, Integrated Pest Management

of the Graduate School by the major adviser and approved by the Department's program leader.

Financial Assistance

All specified application materials must be submitted to the Graduate School, and the student must be admitted in full or conditional standing to be considered for financial assistance. Graduate research assistantships are awarded on the basis of scholarship, potential for advanced study and research, and availability. Graduate research assistantships provide a monthly stipend and a waiver of graduate tuition.

Degree Requirements

The program requires a minimum of 24 months of full-time study, during which an overall GPA of 3.0 or better must be maintained. For M.S. candidates, a minimum of 30 semester credits beyond the B.S. and an oral defense of a research-based thesis and academic subject matter is required. The Ph.D. requires a minimum of 90 semester credits beyond the B.S., (or 60 beyond the MS degree), preliminary written and oral examinations directed toward academic subject matter, and a final oral defense of a research-based dissertation.

Deirdre Prischmann-Voldseth, Ph.D.
Washington State University, 2005
Research interests: Agricultural integrated pest management and arthropod ecology

David A. Rider, Ph.D.
Louisiana State University, 1988
Research Interests:
Systematics of the Pentatomoidea, Molecular Genetics, Ecology of the northern tallgrass prairie arthropods

Joseph Rinehart, Ph.D. (adjunct)
Ohio State University, 1999
Research Interests:
Over-wintering physiology of insects

Richard Roehrdanz, Ph.D. (adjunct)
University of Wisconsin, 1974
Research Interests:
Insect Genetics

James Strange, Ph.D.
Washington State University, 2005
Research Interests:
Bumble bee biology, culture and ecology

Kelley Tilmon, Ph.D. (adjunct)
Cornell University, 2001
Research Interests:
Biological control and ecology

George Yocum, Ph.D. (adjunct)
Ohio State University, 1992
Research Interests:
Insect Diapause Regulation

Environmental Engineering

Program and Application Information

Department Chair: Dr. Eakalak Khan

Program Location: 201 Civil and Industrial Engineering Building

Telephone Number: (701) 231-7244

Degree(s) Offered: M.S.

Application Deadline: January 5th for fall semester; May 20th for spring semester

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Civil Engineering offers a graduate program leading to a Master of Science degree in environmental engineering. The M.S. degree in environmental engineering is offered through a program designed to advance the technical knowledge, competence, and interdisciplinary understanding of the students and to prepare them for entering or advancing within the environmental engineering profession.

The graduate curriculum in environmental engineering offers courses designed to prepare the student with engineering fundamentals as applied to the environment. To complement the major area of study, additional courses are often selected from other disciplines. Students without a B.S. degree in civil engineering will take remedial undergraduate courses to gain an appropriate background in civil engineering.

Faculty

Achintya N. Bezbaruah, Ph.D.
University of Nebraska-Lincoln (UNL), 2002
Research Interests:
Environmental sensors, Recalcitrant and micro pollutants, Contaminant fate and transport, Small community water and wastewater treatment, Environmental management

Xuefeng (Michael) Chu, Ph. D.
University of California, Davis, 2002
Research Interests: Watershed Hydrologic and Environmental Modeling, Overland Flow and Infiltration, Integrated Modeling of Flow and Contaminant Transport

Eakalak Khan, Ph.D.
University of California, Los Angeles, 1997
Research Interests:
Water and Wastewater Quality, Water and Wastewater Treatment, and Storm Water and Non-point Source Pollution

Wei Lin, Ph.D.
SUNY at Buffalo, 1992
Research Interests:
Water and Wastewater Treatment, Hazardous Waste Management

G. Padmanabhan, Ph.D.
Purdue University, 1980
Research Interests:
Stochastic Hydrology, Water Resource Systems, and Hydrologic Modeling

Robert Zimmerman, Ph.D. (adjunct)
North Dakota State University, 1991
Research Interests: Water and Wastewater Treatment, Solid Waste

Admissions Requirements

To be admitted to the graduate Master of Science program in environmental engineering, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in engineering or a basic science area, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) of at least 3.0 or equivalent.

Financial Assistance

Research and/or teaching assistantships may be available. Applicants are considered on the basis of scholarship, potential to undertake advanced study and research, and financial need. To be considered for an assistantship, a completed Graduate School application, official transcripts, and three letters of reference (and TOEFL results for international applicants) must be submitted to The Graduate School. Additional eligibility requirements for teaching assistantships can be found on the Graduate School website.

Degree Requirements

The Master of Science degree thesis a scholarly document prepared by the student which is based on research performed. The research topic is chosen by the student in consultation with his or her adviser. The student and adviser together prepare a plan of study to meet the needs of the individual student. The program contains a minimum of 30 credits of graduate-level material, of which the thesis can count 6 to 10 credits. An overall GPA of 3.0 or better must be maintained. An oral defense of the research-based thesis and comprehensive academic subject matter is required.

A student entering the environmental engineering Master of Science degree program without an undergraduate engineering degree will be required to satisfy the undergraduate requirements for mathematics, basic science, and engineering sciences in addition to the Master of Science requirements.

Food Safety

Program and Application Information

Associate Director: Dr. Clifford Hall

Program Location: Great Plains Institute of Food Safety, 113 Harris Hall

Email: Clifford.Hall@ndsu.edu

Telephone Number: (701) 231-6359

Degree(s) Offered: Ph.D., M.S., Certificate

Application Deadline: March 15th for fall semester; October 15th for spring semester

Testing Requirements

GRE

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Administration

Deland Myers, Ph.D.
Director

Clifford Hall, Ph.D.
Associate Director and Academic Program Coordinator

The Food Safety graduate programs are interdisciplinary and many NDSU graduate faculty participate in advising graduate students in these programs. For more information about faculty involved with these programs and their activities within the Great Plains Institute of Food Safety see www.ndsu.edu/foodsafety or http://www.ag.ndsu.edu/foodsystems/.

Program Description

Background. The lack of individuals with food safety expertise is becoming increasingly evident in government, business, and academia. This food safety expertise gap is widespread and exists in many professions. For these reasons the graduate degrees in Food Safety and the Graduate Certificate in Food Protection were initiated in 2001.

Degrees Offered and the Graduate Certificate The GPIFS offers several programs at the graduate level. Research project based degrees include the Doctor of Philosophy (Ph.D.) and the thesis based Master of Science (M.S.). The thesis based M.S. degree is preparatory for students who may wish to advance to Ph.D. programs. Individuals earning a Ph.D. degree will be

educated as independent researchers, expanding their potential to become principal investigators of food safety research in various arenas, including business, academia, and government. The M.S. degree is offered as a **thesis based option** or a non-thesis option (see **Comprehensive Study Option**) and will prepare students for supervisory roles in the food industry, in regulatory agencies, or in public health. The Graduate Certificate in Food Protection is aimed at professionals looking to augment their skills, as well as graduate students in other programs wishing to add a credential to their degree programs.

Administration The interdisciplinary Food Safety graduate programs are administered through the GPIFS in the School of Food Systems. The GPIFS is primarily composed of faculty participants from the Colleges of Agriculture, Food Systems, and Natural Resources; Arts, Humanities, and Social Sciences; Engineering and Architecture; Human Development and Education; and Science and Mathematics. The GPIFS graduate students and supervisory committees report to the School of Food Systems Director for program level policies and to the College of Graduate and Interdisciplinary Studies as the academic college.

Admissions Requirements

Admission, Advisor Assignment and Assistantships Admission requirements for the Food Safety programs are based on the minimum NDSU requirements for degree programs and graduate certificates, with additional requirements for the research based degree programs (Thesis based M.S. and Ph.D.) including:

Thesis based M.S.

- A relevant baccalaureate degree from an accredited institution of recognized standing. Appropriate degrees might be in food science, food safety, meat science, cereal science, microbiology, veterinary science, economics, engineering, dietetics, nutrition, agricultural policies or communication.
- The Graduate Record Examination General Test scores are required for evaluation purposes. Scores that are lower than the 50th percentile will generally weaken an applicant's chance of being accepted. In all cases, other forms of evidence for academic success will be considered and may supersede the GRE score for evaluative outcomes.

Dissertation Based Ph.D.

- A relevant baccalaureate degree from an accredited institution of recognized standing. Appropriate degrees might be in food science, food safety, meat science, cereal science, microbiology, veterinary science, economics, engineering, dietetics, nutrition, agricultural policies or communication. Applicants with a completed M.S. degree (in any related field of study) are generally regarded as more prepared for the Ph.D. program than applicants with only a Bachelors degree.
- For students that have not already completed an M.S. degree at an institution in the United States, the Graduate Record Examination General Test scores are required for evaluation purposes. GRE scores that are lower than the 50th percentile will generally weaken an applicant's chance of being accepted. In all cases, other forms of evidence for academic success will be considered and may supersede the GRE score for evaluative outcomes.

Non-thesis option and Certificate

- The non-thesis M.S. option and the Graduate Certificate in Food Protection do not require the GRE.

Applications for summer or fall admittance should be received by March 15. Applications for spring admittance should be received by October 15. The Graduate School does not forward applications for review to the program until the application package is complete. Failure to meet these program deadlines may result in rejection or postponement of admission. Common errors resulting in late applications include missing letters of recommendation and late payment of application fees.

Applications completed by the deadlines are forwarded to the GPIFS Executive Committee for review shortly after the deadline. The committee reviews all applications for acceptability. Applications for research based programs (thesis-M.S. and Ph.D.) are then distributed to faculty to determine tentative advisor placements. Acceptance of the applicant will be judged by a committee of faculty using a combination of factors including those presented above and on applicant's recommendations and statement of purpose. No one faculty member can judge an applicant's qualifications and thus we discourage random request to faculty about their qualifications for entrance into the program. Only prospective students that have submitted an application will be evaluated. Applications for research based programs of acceptable quality

may still be rejected if there is not an assistantship available to support the student with, and are therefore the most competitive programs for admission.

Assistantships are reserved for students in the research based programs. Amounts and types of assistantships vary. Research assistantships generally are available through grants obtained by research faculty members and are subject to requirements of the funding source and the NDSU Graduate School assistantship policies. Teaching assistantships are occasionally available to qualified students. See the NDSU Graduate Bulletin for more financial information. Applications of acceptable quality for the non-research based programs (non-thesis M.S. and Graduate Certificate) will generally be accepted into those programs, unless enrollment caps are being enforced. All applicants will be notified about final decisions as soon as possible, however, applicants should understand that processing may take several weeks after the deadlines.

Doctor of Philosophy (Ph.D.)

Requirements The Ph.D. is awarded in recognition of satisfactory completion of advanced studies, written and oral preliminary examinations, performance of novel research in the area of food safety, and development and defense of an acceptable dissertation detailing the student's research. For each doctoral student admitted to the program, an advisory committee will be established. This committee will consist of the major adviser who will chair the committee, and two other selected graduate faculty. Additionally, the Graduate School will appoint an outside member of the committee. The student and major adviser will prepare the plan of study, which is subject to the approval of the committee, the GPIFS director, and the Graduate School dean. The plan of study, which must be filed in the Graduate School, will include not less than 90 semester credits. Fifteen of these credits must be at the 700-789 level. An overall grade point average of 3.0 must be maintained on the required course work.

The plan of study for the Ph.D. will be multidisciplinary. All plans will include sufficient course work to demonstrate a minimum proficiency in food safety. The plan of study should be signed off by the Graduate School by the end of the first semester of enrollment in the program.

Master's of Science (M.S.) Requirements

Students may choose a non-thesis M.S. degree or opt for the research-oriented, thesis-requiring program. The non-thesis option is available for students seeking a broad range of knowledge and skills suitable to the workplace. This degree can be obtained by taking a combination of online and on-campus courses or completely online. This degree will not prepare students for careers in research. Students will be required to compose a novel, comprehensive paper, which is a synthesis of the literature regarding some aspect of food safety. The coordinator of the program, under the direction of the Director of the Great Plains Institutue of Food Safety and the Advisory Board, will review the student's choice of courses and progress as outlined in the program requirements. Based on the performance of the student in the required and optional courses and the required paper, the coordinator will approve whether the student has met all the requirements to receive the M.S. degree with final approval by the Graduate School.

The thesis-requiring degree is a research degree and, as such, can prepare the student for future study at the doctoral level. The student will perform a novel research project designed to contribute to the body of knowledge in some area pertinent to food safety, prepare a thesis on this research, and defend it in a final oral examination administered by the advisory committee. The advisory committee will be composed of the major adviser who will chair the examining committee, two additional graduate faculty, and a Graduate School appointee. The student and major adviser, in consultation with the committee, will design the student's plan of study. The plan of study should be signed off by the Graduate School by the end of the first semester of enrollment in the program.

1. Non-Thesis Option:

   Of the 30 graduate credits required, a minimum of 21 must be in courses approved for graduate credit (601-689 or 700-789). The paper credits must not be fewer than two hours nor more than four. The paper's topic and scope will be determined by the student in consultation with the program coordinator and the Food Safety Master's Paper Course (Safe 797) instructors who will serve as the student's advisory committee.

2. Thesis Option:

   Of the 30 graduate credits required, a minimum of 16 credits must be approved for graduate credit (see above), and thesis credits must not be fewer than 6 nor more than

10 credits. In this case, the student, under the guidance of a major adviser and with the approval of the graduate committee, will perform a novel research project designed to contribute to the body of knowledge in some area pertinent to food safety, prepare a thesis on this research, and defend it in a final oral examination administered by the examining committee.

Graduate Certificate in Food Protection Requirements

To be admitted to this program, students must demonstrate that they have a baccalaureate degree in an area pertinent to food safety from an accredited educational institution of recognized standing. To obtain a Graduate Certificate in Food Protection, students must successfully complete the 9 semester credits of core curriculum (SAFE 601-609). The student must receive a grade of B or better in each course to obtain the certificate.

Genomics and Bioinformatics

Program and Application Information

Program Director: Dr. Phillip McClean

Program Location: Department of Plant Sciences, Loftsgard Hall

Email: **Phillip.McClean@ndsu.edu**

Telephone Number: (701) 231-8443

Degree(s) Offered: Ph.D. M.S.

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

Genomics and Bioinformatics is an interdisciplinary graduate program that involves faculty from nine departments. Advanced research and study will focus on either functional or computation genomics. The program is designed to provide both M.S. and Ph.D. students the necessary skills and intellectual background to work cooperatively with others in a research area that takes a systems-wide approach to the study of the organization and expression of the many genes and their products expressed in an organism. Exposure to modern techniques and instrumentation will prepare the student for success in both industrial and academic careers.

Admissions Requirements

It is the intent of the program to admit students in either of two tracks. The Functional Genomics Track will be for students interested in the generation and application of genomic information. The Computational Bioinformatics Track is intended for students interested in using computer science and statistical approaches to analyze large amounts of genomic data.

Faculty

Eugene Berry, Ph.D.
Northeastern University, 1983
Department:
Veterinary and Microbiological Sciences
Research Interest:
Animal Virology

Xiwen Cai, Ph.D.
Washington State University, 1998
Department:
Plant Sciences
Research Interest:
Cytogenetics

Michael J. Christoffers, Ph.D.
University of Missouri-Columbia, 1998
Department:
Plant Sciences
Research Interest:
Weed Molecular Genetics

Edward L. Deckard, Ph.D.
University of Illinois, Champaign-Urbana, 1970
Department:
Plant Sciences
Research Interest:
Crop Physiology

Anne Denton, Ph.D.
University of Mainz, Germany, 1996
Department:
Computer Science
Research Interest:
Data Mining, Bioinformatics

The Genomics graduate program is open to qualified graduates of universities of recognized standing. The Graduate School minimum for the TOEFL examination applies. In addition, the following are the requirements to be admitted with full standing.

Functional Genomics Track: a B.S. degree with courses in genetics, physiology, biochemistry; an upper-division statistics class; an introductory biology class emphasizing molecular biology; and minimum undergraduate GPA is 3.0.

Computational Bioinformatics Track: a B.S. degree with courses in calculus, comparative computer languages, data structures, an upper-division statistics class, an introductory biology class emphasizing molecular biology, and minimum undergraduate GPA is 3.0

Students can be accepted conditionally into either track without meeting the course or GPA requirements, but will be required to meet those requirements while in residency.

Degree Requirements

Adviser and Graduate Committee:

During the first year, the student will select an adviser, form a graduate committee, and submit the Plan of Study to the Graduate School. The committee must include the student's major adviser, at least one other faculty member of the genomics program, and the Graduate School appointee. For Ph.D. students only, one member of the committee must be from outside the student's home college.

Core Courses

- PLSC 611 Genomics 3 cr
- CSCI/MATH/STAT 732 Bioinformatics 3 cr

Justin D. Faris, Ph.D.
Kansas State University, 1999
Department:
Plant Sciences
Research Interest:
Wheat Molecular Genetics

Marvin W. Fawley, Ph.D.
Miami University, 1985
Department:
Biological Sciences
Research Interest:
Evolutionary Biology

David P. Horvath, Ph.D.
Michigan State University, 1993
Department:
Plant Sciences
Research Interest:
Perennial Weed Physiology

Shahryar F. Kianian, Ph.D.
University of California-Davis, 1990
Department:
Plant Sciences
Research Interest:
Wheat Molecular Genetics

Phillip E. McClean, Ph.D.
Colorado State University, 1982
Department:
Plant Sciences
Research Interest:
Plant Molecular Genetics

Steven W. Meinhardt, Ph.D.
University of Illinois, Champaign-Urbana, 1984
Department:
Biochemistry and Molecular Biology
Research Interest:
Protein Structure/Function

- PLSC 721/BIOC 721 Genomic Techniques 2 cr
- 796 Current Topics in Genomics 2 [2 x 1 cr. (MS)] or 3 [3 x 1 cr. (Ph.D.)] cr
- 790 Graduate Seminar 1 (M.S.) or 2 (Ph.D.) cr

Ph.D. Program

Functional Genomics Option

- Ph. D. Core Courses 13 cr
- Support Courses (required unless on incoming transcript)

  BIOL 659 Evolution 3 cr

  PLSC 631 Intermediate Genetics 3 cr

  STAT 726 Applied Regression and Analysis of Variance 3 cr
- Electives minimum of 15 credits from the Physiology, Gene Expression, Genetics and Computational Elective areas; one course from each of the Physiology, Gene Expression, Genetics elective areas is required
- Research to 90 credits total

  (NOTE: a minimum of 15 didactic credits must be 700-level courses)

Bioinformatics Option

- Ph. D. Core Courses 13 cr
- Support Courses (required unless on incoming transcript)

  CSCI 668 Database System Design 3 cr

  PLSC 631 Intermediate Genetics 3 cr

  STAT 661 Applied Regression Models 3 cr

  CSCI 796 Computational Methods in Bioinformatics 3 cr

Kendall Nygard, Ph.D.
Virginia Polytechnic Institute and State University, 1978
Department:
Computer Science
Research Interest:
Bioinformatics

William Perrizo, Ph.D.
University of Minnesota, 1972
Department:
Computer Science and Operation Research
Research Interest:
Distributed Database Systems, Centralized Database Systems

Birgit Pruess, Ph.D.
Ruhr- Universitat Bochum, Germany , 1991
Department:
Veterinary and Microbiological Sciences
Research Interest:
Microbial Physiology and Gene Regulation

Jack B. Rasmussen Ph.D.
Michigan State University, 1987
Department:
Plant Pathology
Research Interest:
Molecular Plant/Microbe Interactions

Mark Sheridan, Ph.D.
University of California-Berkeley, 1985
Department:
Biological Sciences
Research Interest:
Control of Growth, Development and Metabolism

Vasant A. Ubhaya, Ph.D.
University of California-Berkeley, 1971
Department:
Computer Science and Operations Research
Research Interest:
Algorithm Analysis, Operations Research

- Electives - minimum of 15 credits; a minimum of three courses must be from the Computational area and a minimum of one course must be from either the Physiology, Gene Expression or Genetics Elective areas
- Research to 90 credits total

  (NOTE: a minimum of 15 didactic credits must be 700-level courses)

Elective Areas

Physiology

ARSC 728 Advanced Reproductive Biology 3 cr

BIOC 718 Metabolic Regulation 3 cr

BOT 780 Plant Metabolism and Stress Physiology 3 cr

BOT 784 Photobiology 3 cr

MICR 670 Basic Immunology 3 cr

MICR 680 Bacterial Physiology 3 cr

MICR 781 Advanced Bacterial Physiology 3 cr

PPTH 751 Physiology of Plant Disease 3 cr

ZOO 660 Animal Physiology 4 cr

ZOO 664 Endocrinology 3 cr

ZOO 682 Developmental Biology 3 cr

ZOO 764 Neuroendocrine and Endocrine Systems 3 cr

ZOO 766 Neurophysiology 3 cr

Gene Expression

BIOC 719 Molecular Biology of Gene Expression and Regulation 3 cr

BOT/ZOOL 720 Advanced Cell Biology 3cr

MICR 775 Molecular Virology 3 cr

PLSC 731 Plant Molecular Genetics 3 cr

Genetics

BIOL 659 Evolution 3 cr (required for Functional Genomics Ph.D. Option)

BIOL 796 Molecular Evolution and Phylogenetics 3 cr

MICR 682 Bacterial Genetics and Phage 2 cr

MICR 783 Adv. Bacterial Genetics and Phage 2 cr

PLSC 631 Intermediate Genetics 3 cr (required for Functional Genomics Option)

PLSC 741 Cytogenetics 4 cr
PLSC 751 Advanced Genetics 3 cr
PLSC 780 Population Genetics 2 cr
PLSC 781 Quantitative Genetics 2 cr
PPTH 759 Host-Parasite Genetics 3 cr

Computational

CSCI 724 Survey of Artificial Intelligence 3 cr
CSCI 759 Computational Methods in Bioinformatics 3 cr
CSCI 760 Dynamic Programming 3 cr
CSCI 765 Introduction to Database Systems 3 cr
CSCI 783 Data Mining 3 cr
CSCI 796 Knowledge Discovery in Biological Data 3 cr
CSCI 796 Signal Processing and Analysis in Bioinformatics 3 cr
MATH 635 Mathematical Models of Biological Processes 3 cr
MATH 647 Molecular Topology 3 cr
STAT 650 Stochastic Processes 3 cr
STAT 651 Bayesian Statistical Decision Theory 3 cr
STAT 661 Applied Regression Models 3 cr (required for Bioinformatics Ph.D. option)
STAT 731 Biostatistics 3 cr
STAT 764 Multivariate Methods 3 cr
STAT 796 Computational Statistics 3 cr (required for Bioinformatics Ph.D. option)

M.S. Program -- Thesis Option

Functional Genomics Option

- M.S. Core Courses 11 cr
- Electives- minimum of 9 credits from the Physiology, Gene Expression, and Genetics areas; a minimum of one course must be selected from each of two of these areas
- Research to 30 cr total

Bioinformatics Option

- M.S. Core Courses 11 cr

- Electives - minimum of 9 credits; a minimum of one course must be from the the Physiology, Gene Expression or Genetics Elective areas; the remainder of the courses must be from the Computational area
- Research to 30 cr total

M.S. Program -- Comprehensive Study Option

Functional Genomics Option

- M.S. Core Courses 11 cr
- Electives- minimum of 15 credits from the Physiology, Gene Expression, and Genetics areas; a minimum of one course must be selected from each of two of these areas
- Masters Paper to minimum of 30 credit total

Bioinformatics Option

- **M.S. Core Courses** 11 cr
- **Electives** - minimum of 15 credits; a minimum of two courses must be from the the Physiology, Gene Expression or Genetics Elective areas; the remainder of the courses must be from the Computational area
- **Masters Paper** to minimum of 30 credit total

Examinations

1. **Qualifying Exam (Ph.D. only):**
   This exam consists of written and oral portions. The student will complete a written exam that emphasizes the application of materials presented in the core courses. The members of the genomics graduate program will submit these questions. The oral exam will be administered by the student's graduate committee and will focus on material beyond the core courses that are specific to the research of the student. Upon completion of the qualifying exam, the student will be accepted as a Ph.D. candidate.
2. **Final Exam (M.S. and Ph.D.):**
   The final exam will be an oral defense of the student's research results. The student's graduate committee will administer the exam.
3. **Comprehensive Study Option Paper (M.S. only):**
   M.S. students pursuing the Comprehensive Study Option will be required to complete an in-

depth paper of a specific topic relevant to Genomics. The paper will be reviewed and accepted by the student's graduate committee.

Research

The student is required to perform original research in an area of genomics. This will be under the direction of the student's major adviser. To promote cross-disciplinary research, the student is encouraged to collaborate with a student in the other track. This does not apply to M.S. students pursuing the Comprehensive Study Option.

History

Program and Application Information

Department Head: Dr. John K. Cox

Graduate Coordinator: Dr. Mark Harvey

Email: **ndsu.history@ndsu.edu**

Program Location: Putnam 02

Telephone Number: (701) 231-8654

Degree(s) Offered: Ph.D., M.A., M.S.

Application Deadline: April 1, for assistantship consideration

Test Requirements

GRE

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The graduate program in history at North Dakota State University has offered a master's degree program since the Graduate School was founded in 1954. In 2002, a joint program for a Ph.D. in History was instituted between NDSU and the University of North Dakota. A complete program description follows the M.S./M.A. requirements. The graduate faculty also provides instruction to non-history majors in other departments as well as the region's secondary education instructors who require continuing education credits for certification.

The department offers both the Master of Arts and Master of Science degrees in the areas of United States history, modern European history, or world history. Candidates with two years of foreign language study at the baccalaureate level or who have passed a standard foreign language examination meet the requirements for the Master of Arts. Students taking either

Faculty

Tracy Barret, Ph.D.
Cornell University, 2007
Field:
East and Southeast Asia, Overseas Chinese

John K. Cox, Ph.D.
Indiana University, 1995
Field:
Eastern Europe, Russia, Germany, Ottoman Empire

David B. Danbom, Ph.D.
Stanford University, 1974
Field:
Agriculture and Rural Life, Recent U.S., Progressive Period

Mark Harvey, Ph.D.
University of Wyoming, 1986
Field:
American West, Environmental History, Public History

John A. Helgeland, Ph.D.
University of Chicago, 1973
Field:
History of Christianity, History of Culture, Roman Empire, Philosophy of History

degree may choose either the thesis or comprehensive study option.

The history graduate program provides a rigorous and highly personalized graduate experience. This experience produces confident people with a sense of achievement. They are ready to contribute as scholars and teachers.

Admissions Requirements (Master's Degree)

The Department of History graduate program is open to qualified graduates of universities and colleges of recognized standing.

To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Submit a statement of intent clearly outlining the applicant's research interests, career goals, and purpose for seeking a master's in history.
3. Have earned an undergraduate grade point average of at least 3.0 or equivalent. The department will closely examine grades in history, and other humanities and social science courses.
4. Provide three letters of recommendation that attest to the applicant's critical thinking skills, writing abilities, and motivation. These letters must be received before action will be taken on an application.
5. Provide a statement of intent that clearly outlines the applicant's interest and purpose for seeking a master's degree in history. The department uses this statement to assess the applicant's ability to organize thoughts, to formulate a plan of academic study, and to complete the graduate program. This statement also enables the department to determine whether North Dakota State University's graduate history program suits the applicant's needs and objectives.
6. Submit a substantial paper submitted for an upper-division history class or for a class in the humanities and social sciences.

Thomas D. Isern, Ph.D.
Oklahoma State University, 1977
Field:
History and Folklore of the North American Plains, History of Agriculture

Gerritdina Justitz, Ph.D.
University of California--San Diego, 1996
Field:
Early Modern Europe, Social and Cultural History of the Reformation

Jim Norris, Ph.D.
Tulane University, 1992
Field:
Latin America, Mexico, Spanish Frontier in North America

Larry R. Peterson, Ph.D.
University of Minnesota, 1978
Field:
U.S. Intellectual, Women and Families

David Silkenat, Ph.D.
University of North Carolina, 2008
Field:
Civil War, Colonial America, Social History

The paper should provide evidence of an applicant's ability to synthesize information, to organize his/her thoughts logically, and to communicate clearly and effectively.

7. Take the general Graduate Record Examinations (GRE) and submit these scores before admission to the program. Students admitted to the program generally score an average of 500 on the verbal and quantitative sections of the GRE's. Students scores on the new analytic writing section should be comparable, i.e. 3.5-4.0. The department requires students whose native language is not English to have a minimum TOEFL score of 600 (paper test) or 247 (computer test).

Financial Assistance

The graduate department has graduate assistantships for qualified students. Assistantships are 10-20 hours/week with graduate tuition waiver. Students wishing to apply for a teaching assistantship should express this in writing to the chair of the department. The deadline for assistantship applications is April 1.

The department awards and renews assistantships based on maintenance of good standing in the program and full-time registration during the appointment, demonstration of historical knowledge and good communication skills, progress towards completion of a degree, interest and potential in teaching as a career, financial need, and minority status in cases of equally qualified candidates.

The department awards assistantships for a one-year (10 month) contract period. It renews these assistantships for one additional year pending the availability of funds, progress toward the completion of a degree, and satisfactory job performance.

Degree Requirements

Thesis Option:

A student selecting the thesis option must complete at least 30 semester credits of graduate work with a minimum of 21 credits in history. Most graduate students in history choose this option. The thesis should reflect original thought and research using primary materials. The department recommends that students intending to continue to a Ph.D. program select this option. Students selecting this track must meet the following requirements:

3 credits, Hist 701 (Methods of Historical Research) taken first semester

6 credits from the following (one to be declared the student's major area and the other the minor area):
Hist 730 Readings in North American History
Hist 760 Readings in European History
Hist 780 Readings in World History
1 credit, Hist 705 (Directed Research) taken during second year
9-12 credits, history course work at 600 level or above
6-9 credits, course work in approved outside field, at 600 level or above
1 written comprehensive exam in student's major area
6-10 credits, Hist 798 (Master's Thesis)
1 final oral defense

Non-Thesis Option:

Comprehensive Study Option

A student choosing the comprehensive study option must complete at least 30 semester credits of graduate work with at least 21 credits in history. The student must present three comprehensive study papers. Students write one comprehensive study paper for their major and each of their minor areas of program study. These papers involve substantial research and synthesis in secondary materials. The department does not expect these papers to be original contributions to the world of scholarship, but rather syntheses that demonstrate mastery of particular topics. Students selecting this track must meet the following requirements:

Lesson Plan Option

This option is designed for graduate students who are teachers at the K-12 level, or who plan to be. The number of credit hours and the course requirements are identical to those of the Comprehensive Plan Option. In the Lesson Plan Option, the student prepares three lesson plans in a parallel fashion to the comprehensive study papers (See Comprehensive Study Option above). In addition to the lesson plan, the student needs to reflect on these teaching units and provide an intellectual and pedagogical context for them. This reflection should demonstrate scholarly thinking and effort.

3 credits, Hist 701 (Methods of Historical Research) taken first semester
9 credits, all of the following (one to be declared the student's major area, the others are minor areas):

Hist 730 Readings in North American History
Hist 760 Readings in European History
Hist 780 Readings in World History
6-9 credits, history course work at 600 level or above
6-9 credits, course work in approved outside field, at 600 level or above
1 written comprehensive exam in student's major area
2-4 credits, Hist 797 (Master's Paper)
3 comprehensive study papers
1 final oral defense

Suggested Curricula

Year 1-Fall

701 Methods of Historical Research
730 Readings in North American History
600 or 700 level history elective

Year 1-Spring

760 Readings in European History or 780 Readings in World History
600 or 700 level history electives
600 or 700 level approved outside field elective

Year 2-Fall

600 or 700 level history elective
600 or 700 level history elective
600 or 700 level approved outside field elective
705 Directed Research (thesis option)

Year 2-Spring

760 Readings in European History
or 780 Readings in World History
(both required in comprehensive study option)
797 Master's Paper
or 798 Master's Thesis

Ph.D. in History

The Ph.D. program is jointly conducted by the History Departments of North Dakota State University (Fargo) and the University of North Dakota (Grand Forks). Students should contact the Graduate School on the campus of their choice for application materials.

For more information on this program, please contact at **NDSU**:
Dr. Mark Harvey, Professor and Graduate Coordinator
(701) 231-8828
mark.harvey@ndsu.edu
at **UND**:
Dr. Ty Reese, Associate Professor and Graduate Director
(701) 777-2593
ty_reese@und.edu

Admissions Requirements

1. Preference for admission into the Ph.D. program with full graduate standing will be given to applicants who have a GPA of at least 3.5 in history courses in an earned bachelor's or master's degree.
2. Applicants shall submit a statement of intent clearly outlining their research interests, potential major adviser, career goals, and purpose for seeking a Ph.D. in History.
3. Applicants will submit a substantial paper submitted for a class in History to provide evidence of ability to research thoroughly, to interpret and analyze primary and secondary sources, to synthesize information, to organize thoughts logically, and to communicate clearly and effectively.
4. The GRE examination is required, and preference for admission into the Ph.D. program with full graduate standing will be given to applicants who score a combined total of 1,000 points on the verbal and analytical sections of the GRE aptitude test.
5. The program requires a student for whom English is not a native language to have a minimum TOEFL score of 600.

Degree Requirements

1. Students must satisfactorily complete 90 credits beyond the bachelor's degree. Students entering with an M.A. degree must complete at least 60 additional semester graduate credits. Core course requirements must be met, which include Methods of Historical

Research, Historiography, Seminar in the Teaching of History, at least 2 research seminars, and at least 2 readings courses. Students must complete 36 credits with at least 27 credits in History. Students will earn at least 12 credits in one major field. Students must have at least nine hours each in two minor fields; one minor field must be in History.

2. Students must have a proficiency in two languages other than their native language, or one foreign language and one special research skill such as statistics or computer science.
3. The program will require at least one academic year in residence at either campus. Students will register at one of the universities that will be the student's academic "home". The student's adviser must be employed at the home university. At least one member of the student's committee must be employed at the other (not home) university. Students will have to take courses at both universities.
4. Students will write three comprehensive examinations in their major and minor fields. The exams will be read and graded by the supervisory committee. Students will complete an oral examination based on the written exams. The oral examination is to be conducted by the supervisory committee.
5. Students will write a dissertation (up to 24 credits) on an approved topic in consultation with the faculty adviser and the supervisory committee of five faculty. The dissertation must be based on extensive research in primary and secondary sources, must argue an original thesis, and must be defended before the supervisory committee.
6. The committee will be composed of the faculty adviser who represents the student's field of study and will direct the research and writing of the dissertation. A second member of the committee (second reader) also represents the student's major field of study. A third member of the committee will represent the student's first minor field of study. The fourth member of the committee represents either the student's major field or second minor field. At least one of the four History faculty must be from the cooperating (non-home) university. The Graduate School will appoint the fifth member of the committee.

Major Fields

Students will be required to write three comprehensive exams in their major and minor (or outside) fields. The exams will be read and graded by the student's supervisory committee. Students will complete an oral examination based on the written exams. The oral examination is to be conducted by the supervisory committee.

Major Fields:

Great Plains History

Rural History
North American History
Western European History

Minor Fields:
Public History
World History

Residency Requirements

Students enrolled in the Ph.D. program are required to complete at least one academic year (18 credits minimum) in residence at one campus.

Resident students may qualify for teaching assistantships. Students who have completed an M.A. degree may be assigned full responsibility for undergraduate courses or may be assigned to assist a faculty member in teaching courses.

Students will be required to take some courses from faculty at both campuses but will register at only one university. Some courses will be offered by interactive video network; some will be offered through Internet online systems; some courses will require students to travel to the other campus. Students not residing on one of the cooperating campuses will have to have access to a satisfactory research library for various courses and for dissertation research.

Health, Nutrition and Exercise Science

Program and Application Information

Interim Department Chairs: Dr. Holly Bastow-Shoop, Dr. James Deal

Program Location: Benston Bunker Fieldhouse

Telephone Number: (701) 231-7474

Degree(s) Offered: M.S., MATrg

Application Deadline: February 1 for Fall admission only

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Health, Nutrition and Exercise Sciences (HNES) offers graduate study leading to the Master of Science (M.S.) degree in HNES with options in Exercise/Nutrition Science, Sport Pedagogy and Leadership and Dietetics (on line). The HNES department also offers a Master of Science (M. S.) in Advanced Athletic Training and a Master of Athletic Training (MATrg) degree.

Exercise/Nutrition Science Option

The Exercise/Nutrition Science option prepares the graduate for advanced positions with an emphasis in the areas of physical activity, exercise science, nutrition, and health promotion. The department is devoted to researching and understanding the long-term effects of physical activity and nutrition, and translating this research into effective exercise science and wellness programs for children, adolescents, and men and women of all ages. This option is appropriate for athletic trainers, nutrition, and exercise science graduates.

Faculty

Jay Albrecht, Ph.D.
North Dakota State University, 2009
Research Interests:
Youth Sports Injury and Basic First Aid Applications; Concussion Management in Youth Sport

Thomas C. Barnhart, Ph.D.
University of New Mexico, 1978
Research Interests:
Recreation Management, Playground Safety

Ardith Brunt, Ph.D.
Iowa State University, 1999
Research Interests:
Nutrition, Gerontology

Bryan Christensen, Ph.D.
University of Kansas, 2000
Research Interests:
Biomechanics, Sports Psychology, Strength and Conditioning

Joe Deutsch, Ph.D.
North Dakota State University, 2007
Research Interests:
Physical Education Teacher Education; Coaching

Pamela Hansen, Ed.D.
University of South Dakota, 2000
Research Interests:
Athletic Training Education, Female ACL injuries, Learning Styles

Sport Pedagogy and Leadership Option

The Sport Pedagogy/Leadership option prepares the graduate for advanced positions with an emphasis in the areas of physical education teaching/administration and recreation leadership/administration. The department is devoted to researching and understanding the long-term effects of physical activity and nutrition, and translating this research into effective exercise science and wellness programs for children, adolescents, and men and women of all ages. This option is appropriate for physical education teachers, physical education non-teaching majors and recreation and sports management graduates.

Dietetics Option (On-line)

Dietetics is one of the most dynamic and versatile of the health-related professions, and this program prepares registered dietitians to practice at an advanced level or pursue doctoral study. The GPIDEA (**www.gpidea.org/index.html**) Dietetics option provides opportunities for registered dietitians and registration-eligible dietetic program graduates to integrate and apply principles from the biomedical sciences, human behavior, and management to design and lead effective food and nutrition programs in a variety of settings. This option is fully online.

In a multi-institution degree program: 1) You apply and are admitted to one university; 2) Enroll in all your courses at that university; and 3) Graduate or receive a certificate from that university.

A Dietetics graduate candidate must complete a minimum of 36 credit hours to earn a Masters of Science degree in Health, Nutrition and Exercise Sciences. Students may select either the thesis (Plan A) or comprehensive study (Plan B) option. Students selecting the Plan A option will complete a six-credit research

Kristen Hetland, Ph.D.
North Dakota State University, 2009
Research Interests:
Physical Education Teacher Education

Gary Liguori, Ph.D.
North Dakota State University, 2005
Research Interests:
College Student Wellness, CVD

Kevin Miller, Ph.D.
Brigham Young University, 2009
Research Interests: Exercise Associated Muscle Cramps: Treatments and Pathogenesis, Heat Illness Prevention, Rehydration Strategies for Athletes, Gastric Emptying, Electrolyte and Hydration Balance

Yeong Rhee, Ph.D.
Oklahoma State University, 1999
Research Interests:
Trace Elements, Chronic Disease , Immune Function, Functional Foods

Bradford N. Strand, Ph.D.
University of New Mexico, 1988
Research Interests:
Physical Education Curriculum and Instruction, Fitness Education, Sport Sociology

Sherri Nordstrom Stastny, **Ph.D.**
North Dakota State University, 2007
Research Interests:
Nutrition, Gerontology

Donna J. Terbizan, Ph.D.
The Ohio State University, 1982
Research Interests:
Exercise Physiology, Fitness, Wellness, Exercise Science, Chronic Disease Change

thesis while students selecting the Plan B option will complete a three-credit master's paper. It is recommended that students interested in conducting research or desiring to continue into a Ph.D. program select the thesis option. Students may complete three credits of HNES 795 FE/Dietetics or HNES 793 IS/Dietetics in the dietetics option.

Master of Science in Advanced Athletic Training (MS):

The MS in Advanced Athletic Training (40 credits) is a post-professional/post certification. The student will be exposed to didactic content in the advanced skills and knowledge of diagnostic evaluation, modalities, technology, and leadership. The program involves extensive research and application of the latest theories and techniques in athletic training and related fields. Clinical practice will enable students to be proactive in the application of new knowledge and skills. This degree is for the student who has graduated with an entry-level athletic training degree from a CAATE accredited program and has earned the “ATC” credential or is eligible to sit for the BOC, Inc. exam. See the **MS website** for all necessary information regarding application process and additional forms.

Master of Athletic in Training Athletic Training (MATrg)

This degree is for the student who is interested in becoming a certified athletic trainer. The MATrg is accredited by the Commission on Accreditation of Athletic Training Education (CAATE). It will prepare a student to take the Board of Certification, Inc. (BOC) exam and earn the 'ATC' credential. Didactic courses and clinical experience courses focus on prevention, assessment, treatment and rehabilitation of injuries resulting from physical activity. Students who are interested in this two year (36 credits) program must have a conferred baccalaureate degree from an accredited institution

Admission Requirements for MATrg:

1. A Bachelors degree in a related field from an accredited institution
2. Undergraduate overall GPA of 3.0 on a 4.0 scale
3. Acceptance into the NDSU Graduate School (see below)

Academic Requirements for MATrg:

1. Documentation of 50 hours of observation completed under the direct supervision of an BOC ATC ® in an athletic training room setting

2. Minimum of “C” or higher in the following college courses:
    a. Human Anatomy and Lab
    b. Human Physiology and Lab
    c. Exercise Physiology and Lab
    d. Kinesiology/Biomechanics and Lab
    e. Nutrition
    f. Psychology
    g. Personal/Community Health
    h. Pharmacology
    i. Medical Terminology
3. Current Professional Rescuer First Aid/CPR/AED card

    After completing this program (36 credits), the student will be eligible to take for the Board of Certification, Inc. (BOC) exam. Upon meeting these requirements, they must subsequently pass a test administered by the BOC, Inc. Only after passing the computer based exam will an individual be awarded the credentials “ATC” (NATA, 2009).Certification by the BOC, Inc. is the entry-level credential and is required by most employers. See the **MATrg website** for all necessary information regarding application process and additional forms.

Admissions Requirements

Qualified students may apply for admission in graduate programs in the HNES department leading to the Master of Science (M.S.) degree in Health, Nutrition and Exercise Science or Master of Science (M.S.) degree in Advanced Athletic Training or the Master of Athletic Training (MATrg) degree.

In addition to requirements described under academic information elsewhere in this bulletin, the following criteria will be considered at the time of application for admission into graduate study. Admission to a master's degree program is considered ONLY after all required application materials have been received and reviewed. In order to be considered a student must have a Bachelor of Science degree in an HNES related field from an accredited institution, and an overall undergraduate GPA of 3.0 on a 4.0 scale, and have submitted all required materials as listed.

The required materials are

1. Completed, signed application form;

2. Official transcripts of all previous collegiate work, including one verifying graduation with a baccalaureate degree from an accredited institution;
3. Three references that evaluate the applicant's potential for success as a graduate student in the chosen master's degree program; and
4. An exhibit of the applicant's written competency through an essay discussing professional philosophy and professional goals.

The Department of Health, Nutrition and Exercise Sciences reserves the right to obtain additional information about the student's professional competence from qualified professionals. Admission decisions are based upon the predicted success of the applicant as a student and professional in the chosen field and are made only after considering all available data.

Financial Assistance

Both research and teaching assistantships may be available. Applications are considered on the basis of scholarship, potential to undertake advanced study and research, and financial need. To be considered for an assistantship, a completed Graduate School Application, official transcripts, and three letters of reference must be received by the Graduate School not later than Feb 1. The department admits students for fall semester only. Students are also required to submit a letter of interest and complete a department application for teaching assistantships after they have been accepted into the department as a graduate student. Letters of interest should be submitted to the department Graduate Coordinator. Graduate assistants teach approximately six credits each semester, receive a financial stipend for their work, and a full tuition waiver for fall, spring, and summer semesters. Assistantships are available contingent upon current funding.

Degree Requirements

The Master of Science in HNES requires a minimum of 30 semester credits in Thesis, Comprehensive Study or Field Experience options (see program for requirements). The Master of Science in Advanced Athletic Training requires 40 semester credits (thesis option only) and the Masters of Athletic Training requires 36 semester credits (intern option only).

Horticulture/Plant Sciences

Program and Application Information

Interim Chair: Dr. Dwain Meyer

Program Location: 166 Loftsgard Hall

Telephone Number: (701) 231-7971

Degree(s) Offered: Ph.D., M.S.

Application Deadline:

Test Requirements

GRE

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Plant Sciences offers graduate studies leading to the M.S. degrees in Plant Sciences, Cereal Science, and Horticulture, and to a Ph.D. degree in Plant Sciences and Cereal Science. Specialized academic and research training in Plant Sciences is available in plant breeding and genetics, weed science, biotechnology, field and forage crop production and management, and sports and urban turfgrass management. Areas of specialization in Horticulture and Forestry include breeding and genetics, biotechnology, physiology, propagation, and production and management of horticultural crops such as woody plants, potatoes, vegetables, and herbaceous ornamentals. Areas of specialization in cereal science may involve research in the areas of carbohydrates, enzymes, legumes, and other northern-grown crops; barley malting and brewing; wheat milling, baking, and pasta processing. Each study area is designed to provide students with a comprehension of the discipline and of relevant regional and global-community social issues.

Faculty

James V. Anderson, Ph.D.
Virginia Polytech Institute, 1990
Research Interests:
Plant Biochemistry

James Beaver, Ph.D.
University of Illinois, 1980
Research Interests:
Dry Bean Genetics

Bryan Brunner, Ph.D.
Michigan State University, 1992
Research Interests:
Breeding Tropical/subtropical Crops

Marisol Berti, Ph.D.
North Dakota State University, 2007
Research Interests:
Forage and Biomass Crop Production

Xiwen Cai, Ph.D.
Washington State University, 1998
Research Interests:
Wheat Genetics

Larry G. Campbell, Ph.D.
Kansas State University, 1974
Research Interests:
Sugar beet Genetics

Marcelo J. Carena, Ph.D.
Iowa State University, 1999
Research Interests:
Corn Breeding

The Department of Plant Sciences is located in Loftsgard Hall, completed in 1991, with modern and well-equipped research laboratories, offices for faculty and graduate students, and classrooms. Loftsgard Hall, which is part of the Plant Science Complex, provides a state-of-the-art facility for interdisciplinary research in plant sciences, ranging from basic studies and biotechnology to the more traditional applied areas. Facilities for cereal science research are located in Harris Hall. These facilities include analytical laboratories for grain quality research, baking, milling, malting and brewing, and pasta and noodle processing. State-of-the-art greenhouses and extensive growth chamber facilities are also available, as are 100 acres of field research land adjacent to the Plant Science Complex. An additional 500 acres of research land are located near the North Dakota State University campus. A horticultural farm only 25 miles west of campus has an extensive arboretum. Excellent supporting disciplines located nearby, or in the Plant Science Complex, include Soil Science, Botany, Cereal and Food Sciences, Biochemistry and Molecular Biology, Entomology, and Plant Pathology. The Plant Sciences Department encourages interdisciplinary research, and students frequently tailor their research program to meet their interests by working with faculty in one or more of the supporting disciplines.

Graduate student numbers per faculty member are limited, so the student gets adequate personal attention and works closely with their adviser in research. Final selection of the adviser will be made on the basis of the student's interest, availability of space in the researcher's laboratory, and a common desire of the student and professor to work together. Not quite half of the graduate students are Ph.D. candidates.

Patrick M. Carr, Ph.D.
Montana State University, 1989
Research Interests:
Sustainable Agriculture

Shiaoman Shaw Chao, Ph.D.
North Carolina State University, 1984
Research Interests:
Small Grains Genomics

Wun Shaw Chao, Ph.D.
University of California-Davis, 1996
Research Interests:
Perennial Weeds

Michael J. Christoffers, Ph.D.
University of Missouri-Columbia, 1998
Research Interests:
Weed Science/Genetics

David Wenhao Dai, Ph.D.
North Dakota State University, 2001
Research Interests:
Woody Plant Physiology, Biotechnology

Lynn S. Dahleen, Ph.D.
University of Minnesota, 1989
Research Interests:
Barley Genetics, Biotechnology

Nicholas L. David, Ph.D.
Oregon State University, 2007
Research Interests:
Extension and Research Activities with Potatoes in both Minnesota and North Dakota

Edward L. Deckard, Ph.D.
University of Illinois, 1970
Research Interests:
Crop Physiology

Admissions Requirements

The Department of Plant Sciences graduate programs are open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in plant sciences and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 (B or better) or equivalent. Students with a previous graduate degree with a GPA of 3.0 or equivalent may be admitted in full standing.

Students who do not meet all requirements for admission, but show potential for successful graduate study, may be admitted under a conditional status. Evidence must be provided, showing that the applicant's potential is not adequately reflected by his/her record.

Financial Assistance

Research assistantships (half-time) are provided on a competitive basis, usually based on scholarship and potential to undertake advanced study and research. As of the 2009-2010 academic year, the annual stipend generally is $16,100 for an M.S. candidate and $17,300 for a Ph.D. candidate, but this may vary based on the research project. Graduate tuition is waived for all students with research assistantships. A limited number of graduate fellowships are available. The information provided for the application to The Graduate School is also used to assign

Douglas C. Doehlert, Ph.D.
University of Wisconsin, 1982
Research Interests:
Oat Variety Development and Quality Production

Elias M. Elias, Ph.D.
North Dakota State University, 1987
Research Interests:
Durum Wheat Breeding, Genetics

John Erpelding, Ph.D.
Montana State University, 1996
Research Interests:
Geneticist Sorghum Germplasm

Justin D. Faris, Ph.D.
Kansas State University, 1999
Research Interests:
Wheat Molecular Genetics

Michael E. Foley, Ph.D.
University of Illinois, 1982
Research Interests:
Weed Biology

Karen L. Fugate, Ph.D.
Ohio State University, 1995
Research Interests:
Sugar beet Physiology

Greta Gramig, Ph.D.
University of Wisconsin-Madison
Research Interests:
Weed Biology and Ecology

Kenneth F. Grafton, Ph.D.
University of Missouri, 1980
Research Interests:
Dry Bean Breeding, Genetics

available assistantships to applicants. The Plant Sciences Department also has numerous annual scholarships of $500 to $1000 each for outstanding Plant Sciences graduate students.

Degree Requirements

The M.S. program (Thesis Option) requires completion of at least 30 credits; this includes 10 credits of thesis research. The Ph.D. program requires completion of at least 90 credits; this includes 30 credits for an earned M.S. degree (Thesis Option) and 20 additional research credits. For each M.S. or Ph.D. candidate, a plan of study will be developed in the first year that meets the disciplinary requirements as well as the individual needs of the student. The faculty adviser and other members of the student's supervisory/advisory and examining committee assist in developing of the plan of study as well as the student's research plan. An M.S. Program (Comprehensive Study Option) is also offered in Plant Sciences. This option requires completion of at least 30 credits, including 3 credits of a Master's Paper.

Candidates for the M.S. degree normally satisfy all requirements within a two-year period, and Ph.D. candidates normally require three additional years. For M.S. candidates, an oral examination of academics related to the discipline and the research-based thesis is required. The Ph.D. candidates are required to pass a preliminary written and oral examination of academics related to the discipline and a final oral defense of a research-based dissertation. A B.S. to Ph.D. program is permitted for students who meet higher admission requirements.

Yong Qiang Gu, Ph.D.
University of California, 1994
Research Interests:
Genetics

Elcio P. Guimaraes, Ph.D.
Iowa State University, 1985
Research Interests:
Cereal Plant Breeding

James J. Hammond, Ph.D.
University of Nebraska, 1969
Research Interests:
Flax Breeding, Biometrics, Computer Programming

Harlene Hatterman-Valenti, Ph.D.
Iowa State University, 1993
Research Interests:
High-Value Crop Production

Theodore C. Helms, Ph.D.
Iowa State University, 1986
Research Interests:
Soybean Breeding, Genetics

Dale E. Herman, Ph.D.
Purdue University, 1966
Research Interests:
Woody Plants, Propagation, Ornamentals

Richard D. Horsley, Ph.D.
North Dakota State University, 1988
Research Interests:
Barley Breeding, Genetics

David P. Horvath, Ph.D.
Michigan State University, 1993
Research Interests:
Perennial Weed Physiology

Khwaja Hossain, Ph.D.
University of Wales, 1995
Research Interests:
Molecular Genetics and Genomics

Kirk A. Howatt, Ph.D.
Colorado State University, 1999
Research Interests:
Weed Science-Annual Weeds

Brent S. Hulke, Ph.D.
University of Minnesota, 2007
Research Interests:
Flax and Sunflower Genetics

Chao C. Jan, Ph.D.
University of California, Davis, 1974
Research Interests:
Sunflower Cytogenetics

Prem P. Jauhar, Ph.D.
Indian Agricultural Research Institute, New Delhi, 1963
Research Interests:
Wheat Cytogenetics

Brian Jenks, Ph.D.
University of Nebraska, Lincoln, 1996
Research Interests:
Integrated Weed Management

Burton L. Johnson, Ph.D.
North Dakota State University, 1993
Research Interests:
Crop Production

Thomas J. Kalb, Ph.D.
Virginia Polytechnic Institute & State University, 1988
Research Interests:
Extension Horticulture

Herman J. Kandel, Ph.D.
North Dakota State University, 1995
Research Interests:
Crop Production

Penny Kianian, Ph.D.
University of Minnesota, 2007
Research Interests:
Genetics

Shahryar F. Kianian, Ph.D.
University of California-Davis, 1990
Research Interests:
Wheat Germplasm Enhancement

Chiwon W. Lee, Ph.D.
Purdue University, 1977
Research Interests:
Vegetables, Floriculture, Biotechnology

Deying M. Li, Ph.D.
Iowa State University, 2001
Research Interests:
Sports Turf Management

Yin Li, Ph.D.
Southern Yangtze University, 2006
Research Interests:
Barley & Malt Quality

Edward C. Lulai, Ph.D.
North Dakota State University, 1978
Research Interests:
Potato Physiology

Rodney G. Lym, Ph.D.
University of Wyoming, 1979
Research Interests:
Weed Science-Perennial Weeds

Raul E. Macchiavelli, Ph.D.
Pennsylvania State University, 1992
Research Interests:
Statistics/Biometry

Phillip E. McClean, Ph.D.
Colorado State University, 1982
Research Interests:
Dry Bean Genetics, Biotechnology

Michael S. McMullen, Ph.D.
University of Minnesota, 1976
Research Interests:
Oat Breeding, Genetics

Kevin McPhee, Ph.D.
University of Idaho, 1995

Mohamed Mergoum, Ph.D.
Colorado State University, 1991
Research Interests:
Hard Red Spring Wheat Breeding

Dwain W. Meyer, Ph.D.
Iowa State University, 1970
Research Interests:
Forage Management, Cropping Systems

Juan Osorno, Ph.D.
North Dakota State University, 2006
Research Interests:
Dry Edible Bean Breeding

Carlos Ortiz, Ph.D.
University of Arkansas, 1993
Research Interests:
Genetics- Starchy Crops and Turf

Timothy Porch, Ph.D.
Cornell University, 2001
Research Interests:
Dry Bean Breeding and Genetics

Lili Qi, Ph.D.
Nanjing Agricultural University, 1997
Research Interests:
Wheat Genetics

Joel K. Ransom, Ph.D.
University of Minnesota, 1982
Research Interests:
Small Grains

Paul B. Schwarz, Ph.D.
North Dakota State University, 1987
Research Interests:
Malting Barley Quality

Gerald J. Seiler, Ph.D.
North Dakota State University, 1980
Research Interests:
Sunflower and Sugar beet Germplasm

Asunta L. Thompson, Ph.D.
University of Idaho, 1998
Research Interests:
Potato Breeding

Senay Simsek, Ph.D.
Purdue University, 2006
Research Interests:
Hard Spring Wheat Quality

Jeffrey C. Suttle, Ph.D.
Michigan State University, 1979
Research Interests:
Potato Physiology

Linda Wessel-Beaver, Ph.D.
University of Illinois, 1981
Research Interests:
Tropical Pumpkin and Squash Breeding

M. Dale Williams, Ph.D.
The University of Arizona, 1978
Research Interests:
Seed stocks, Crop Production

Steven S. Xu, Ph.D.
North Dakota State University, 1994
Research Interests:
HRSW Development

Qi Zhang, Ph.D.
Kansas State University, 2007
Research Interests:
Turfgrass Stress Physiology

Richard K. Zollinger, Ph.D.
Michigan State University, 1989
Research Interests:
Weed Science-Applied Weed Control

Alan J. Zuk, Ph.D.
Kansas State University, 2005
Research Interests:
Sports and Urban Turfgrass Management

Human Development

Program and Application Information

Program Coordinator: Dr. Greg Sanders

Program Location: College of Human Development and Education

Email: **Greg.Sanders@ndsu.edu**

Telephone Number: (701) 231-8211

Degree(s) Offered: Ph.D.

Application Deadline: February 1

Test Requirements

GRE (must have been taken in the last five years)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6.0

Faculty members participating in the doctoral program are from the following units:

Apparel, Design, and Hospitality Management; Human Development and Family Science; Education; Health, Nutrition, and Exercise Sciences.

Program Description

The College of Human Development and Education offers a doctoral degree program in Human Development. The purpose of the program is to train doctoral students in three areas of human development: Applied Gerontology, Wellness, and Counselor Education.

The program is intended to produce professionals with strong skills in research, teaching, and service. These professionals will have a strong interdisciplinary understanding of human development and the needs of a changing society.

With the Applied Gerontology track, graduates can work directly with older persons in such areas as health promotion programs, intergenerational activities for older persons, senior centers, or retirement communities. Gerontologists can also work in education and research, including conducting research on the aging process and social and developmental aspects of

aging; teaching students, professionals, and older adults and their families about aging; aging policy development; and program planning and administration.

The purpose of the Wellness track is to prepare researchers/scholars, leaders, and teachers in the health and wellness promotion area. The continued growth of exercise and wellness in a variety of settings, including corporate, educational, governmental, medical, and private programs, has created a demand for scholars in this area.

Ph.D. graduates in the Counselor Education Track will have many career areas open to them. The major areas of emphasis are higher education faculty positions, supervision, research, multicultural practice and related areas.

Admissions Requirements

1. Students could enter with an approved master's degree or with a bachelor's degree. The candidate's master's degree should include a research thesis. A student without a completed thesis could be accepted if the faculty determined that he/she had appropriate research skills or could recommend an appropriate research experience. In addition, a student may be required to complete prerequisite courses. Candidates must have adequate preparation in an appropriate field of study for the chosen track and show potential to undertake advanced study and research as evidenced by academic performance and experience.
2. At the baccalaureate level, students must have earned a cumulative grade point average of at least 3.0 or equivalent. Students with a previous graduate degree with a GPA of 3.0 or equivalent may be admitted in full standing.
3. The Graduate Record Exam: No minimum is requested but must have been taken in last five years.

Financial Assistance

The student must be accepted in full or conditional status before he/she is eligible for a teaching or research assistantship in the College of Human Development and Education. To be considered for an assistantship, the student must submit a letter to the college indicating interest and special skills/experiences that would qualify him/her for an assistantship.

Degree Requirements

Human Development Core (34 credit minimum)

Courses	Credits
HDE 720 Interdisciplinary Approaches to Human Development	3
HDE 790 Doctoral Seminar Orientation	1
Research Courses	
Three additional credits in research methods (beyond the equivalent of HDFS 702/EDUC 703)	3
Three additional credits in statistics (beyond the equivalent of STAT 725) are required as approved by the students' committee.	3
794 Teaching Internship	3
799 Doctoral Dissertation	10

(794 and 799 credits are available from each department)

The following courses are required prerequisites to the Doctoral program in Human Development. Students who have not had these courses or equivalents as part of a masters program are required to complete them as part of this core.
Students who have completed any of the courses below will take an additional equivalent number of elective credits to complete the total number of program credits required.

Research Methods and Statistics

HDFS 703 Research Methods in Child Development and Family Science	3
EDUC 703 Research, Measurement and Program Evaluation	3
OR EQUIVALENT AND	
STAT 725 Applied Statistics	3
OR EQUIVALENT	

Track I: Applied Gerontology

Gerontology Foundation Courses (15 cr.)

HDFS 760 Aging Policy	3
HDFS 786 Advanced Human Development: Mid/Late Adulthood	3
ADHM 665 Aging and the Environment	3
HDFS 722 Applied Research in Gerontology	3

Elective Courses (15 credits minimum)

Students must take a minimum of 9 credits of didactic courses. It is also recommended that students take some credits of HDFS or HNES 794 Practicum. Students should confer with their advisor regarding elective course selection.

Didactic Courses with a Gerontology focus include the following:

HDFS 660 Adult Development and Aging	3
HDFS 682 Family Dynamics of Aging	3

SOC 641 Sociology of Death	3
SOC 640 Sociology of Aging	3
HDFS 681 Gender and Aging	3
HNES 652 Nutrition, Health and Aging	3

The following can be scheduled in any semester in consultation with your graduate advisor.

794 Teaching Internship – 3-6 credits

794 Practicum 3 credits minimum

799 Doctoral Dissertation 10-15 credits

NOTE: Doctoral students must have a minimum of 15 didactic credits at the 700 level.

Total Credits required = 64 minimum following the master's degree; 94 minimum following the bachelor's degree.

Track II: Wellness

Wellness Foundation Courses (12 credits)

HNES 793 IS/Research in Wellness (may take 1 credit at a time)	3
HNES 726 Nutrition in Wellness	3
HNES 727 Physical Activity in Wellness	3
HDFS 782 or HDFS 784	3

(One course will meet the HDE Core requirement and the other course will meet the Wellness Track Foundation Course Requirement)

Wellness Elective Courses (18 credits minimum)

Elective courses as determined by the student's committee. Twelve of the 18 credits must be didactic courses.

NOTE: Doctoral students must have a minimum of 15 didactic credits at the 700 level.

Total credits required = 64 minimum following the master's degree and 94 credits minimum following the bachelor's degree.

Track III: Counselor Education

Candidates for the Counselor Education track are required to have earned an approved Masters degree which would include the following prerequisite courses, or courses with documented content expected in these prerequisite areas.

Candidates entering with a Bachelors degree or with Masters degrees not including these prerequisite areas would need to take courses in the deficient areas (in addition to the required credits necessary for the Doctoral degree).

Counselor Education Foundation Courses (34 credits)

CNED 763 Advanced Testing and Appraisal	3
CNED 767 Advanced Group Counseling	3
CNED 779 Quantitative and Survey Research	3
CNED 769 Theory and Practice for Counselor Educ	3
CNED 794C Practicum	3
CNED 780 Ethical and Legal Issues in Counselor Education	3
CNED 787 Professional Issues: Professional Development, Consultation, and Publishing	3

CNED 771C Education and Supervision in a Multicultural Society	3
CNED 772 Advanced Counseling Theories	3
CNED 770 Counselor Supervision	3
CNED 776 Qualitative Research & Program Eval	3
CNED 790 Doctoral Seminar	**4**
CNED 794C Internship	**3-5**
CNED 799 Dissertation	**10-15**

Total credits required: 71 minimum following the master's degree; 101 minimum following the bachelor's degree.

Industrial and Manufacturing Engineering

Program and Application Information

Graduate Program Coordinator: Dr. Om Prakash Yadav

Department Head: Dr. Kambiz Farahmand

Program Location: 202 Civil and Industrial Engineering Building

Telephone Number: (701) 231-7285

Degree(s) Offered: Ph.D., M.S.

Application Deadline: May 1, but applications will be considered year-round

Test Requirements

GRE

M.S.general test score of 1150 (Verbal + Quantitative) and Analytical Writing score of 4.0 or better

Ph.D. 1200 or better (Verbal + Quantitative) and Analytical Writing score of 4.5 or better

English Proficiency Requirements

TOEFL ibT 81

- ibT Speaking 23
- ibT Writing 21

IELTS 7.0

- IELTS Writing 5.5
- IELTS Speaking 5.5

Program Description

The Department of Industrial and Manufacturing Engineering offers graduate studies at both the Master of Science and Doctor of Philosophy levels. A Master of Science degree may be earned in either Industrial Engineering and Management (IE&M) or Manufacturing Engineering (MfgE). The Master of Science degree can be completed through a thesis option or project

Graduate Faculty

Canan Bilen-Green, Ph.D.
Statistics, University of Wyoming, 1998
Research Interests:
Quality and Reliability Engineering, Productivity Analysis, Design and Auditing of Quality and Productivity Monitoring Systems, Statistical Modeling and Applications in Industry, Statistical quality control applied to manufacturing, Material strength characterization, Inventory management, and Healthcare

John R. Cook, Ph.D.
Human Factors Engineering, Purdue University, 1991
Research Interests:
Human Factors Engineering, Ergonomics, Person-System Optimization, Healthcare Management Engineering, Cognitive and physical ergonomics job design, Human-centered product design and job satisfaction research methods, Analysis of human factors issues associated with space-based manufacturing, Framework for automation of surveillance of complex systems

option. The project option is available only to candidates who have been professionally employed in industrial engineering, manufacturing engineering or a related field and are working in their field at the time of application for admission to graduate study. The IE&M master's programs is designed to equip students with the ability to analyze, design, and manage industrial and business systems as well as to enable students to develop scholarly abilities to further pursue a Ph.D. degree in industrial and manufacturing engineering. Students have an opportunity to conduct research in the development of theoretical concepts and industrial systems. For more information about our department and programs please visit our department site at **http://www.ndsu.edu/ndsu/ime/** .

Admissions Requirements

Graduate study in the Industrial and Manufacturing Engineering Department is open to all qualified baccalaureate graduates from universities and colleges of recognized standing.

To be admitted for M.S. or Ph.D. studies with full standing, the applicant must:

1. Have earned a baccalaureate degree from an educational institution of recognized standing;
2. Have obtained adequate preparation in industrial engineering, manufacturing engineering, or a closely related field;
3. Have demonstrated a potential to undertake advanced study and research, through such evidence as prior academic performance and/or professional experience and/or recognized academic examination;

Kambiz Farahmand, Ph.D., P.E.
Industrial Engineering, University of Texas, 1992
Research Interests:
Ergonomics Design, Healthcare, Facilities and Production Layout - Planning & Management, Human Exposure and Physiology Simulation, ISO 9001 Quality Management System, Productivity Analysis & Waste Management, Respiratory& Life Support System, Lean Manufacturing, Safety and Human Factors Engineering, Manufacturing Systems, Simulation & Modeling, Operations & Materials Management and Strategic Planning, NanoTechnology, Computer Network Management

Reza A. Maleki, Ph.D., P.E., C.Mfg.E.
Engineering, North Dakota State University , 1989
Research Interests:
Plant-wide Assessment, Manufacturing and Productivity Improvements, Rapid Product Development and Realization, Production Systems Design, Supply- Chain management, Product analysis for manufacturability

Valery R. Marinov, Ph.D.
Manufacturing Engineering, Technical University of Sofia, 1992
Research Interests:
Advanced packaging for flexible microelectronics, laser processing in microelectronics, nanocomposite materials applications.

4. Have earned, at the baccalaureate level, a cumulative grade point average [GPA] in all courses of at least 3.0 or equivalent. Students who have earned a graduate degree with a GPA of 3.0 or equivalent may be admitted in full standing.
5. The Graduate Record Examination (GRE) general test score of 1150 (Verbal + Quantitative) and Analytical Writing score of 4.0 or better for masters degrees and 1200 or better (Verbal + Quantitative) and Analytical Writing score of 4.5 or better for doctoral degree is required of all students admitted.

Degree Requirements

The Master of Science degree in Industrial Engineering and Management or Manufacturing Engineering requires 30 credits of graduate-level study. For the thesis option, of the required minimum 30 credits, at least 21 credits must be didactic courses numbered 601-689, 691, 700-789, and 791 while the research credits (798) must be at least 6, but not more than 10, credits. For the comprehensive study option, of the required minimum 30 credits, at least 27 credits must be didactic courses numbered 601-689, 691, 700-789, and 791 while the research credits (797) must be at least 3, but not more than 4, credits.

The Doctor of Philosophy degree requires 60 credits beyond the M.S. requirement. Didactic coursework must account for at least 27 credits, and of these, 15 credits must be earned in 700-level courses. It is customary for the remainder of the didactic credit requirement to be dedicated directly to the dissertation, either through course preparation, focused research or writing.

Jing Shi, Ph.D.,
Industrial Engineering, Purdue University , 2004
Research Interests:
Renewable energy development, Wind energy system, Healthcare operation improvement, Healthcare informatics, Wireless sensor network, RFID applications, Micro/nano manufacturing, Multiscale modeling of manufacturing processes, Composite materials, Microelectronics

David L. Wells, Ph.D., C.Mfg.E.
Engineering Management, University of Missouri-Rolla, 1996
Research Interests:
Assembly of Micro and Nano Components, Printed Electronics, Process Engineering for Electronics Manufacturing, Advanced Manufacturing Processes, Product Realization, Application of RFID Technology, Quantitative Manufacturing Management, Advanced Manufacturing in Economic Development

Om Prakash Yadav, Ph.D.
Industrial Engineering, Wayne State University, 2002
Research Interests:
Quality and Reliability Engineering; Robust Product/Process Design, Concurrent Engineering, TQM, Lean Manufacturing, Six Sigma Methodologies, Production & Operations Management, Optimization Techniques, Supply-Chain Management, Fuzzy Logic And Neural Networks, Quantitative Analysis of Operations Management

For either the M.S. or Ph.D., all courses taken outside of the IME Department must be approved in advance by the student's academic adviser. The total course of study must be approved by the student's academic adviser, thesis committee, graduate program coordinator and department chair. Students completing graduate degrees within the IME Department responsibility are expected to exhibit demonstrable expertise in the core competencies of either industrial engineering or manufacturing engineering. Students whose undergraduate major is in another field may be required to include some or all of the core competencies in their graduate coursework. For further information in this regard, please consult the IME Department.

All graduate students are required to register for Research Seminar [IME 790] for each semester in residence. This is a one-credit experience for the academic year, but does not count towards the total degree credit requirement. Each new student must complete a preliminary thesis or project proposal within six months of beginning graduate studies, and it is recommended that this be completed during the first semester in residence. The proposal, if approved by the IME Graduate Studies Committee, will provide the direction for the remainder of the student's degree work. At the same time, the student will choose a thesis or project adviser from the IME Department faculty. By the end of the first year in residency, the student must have selected a supervisory committee. This committee will be chaired by the faculty advisor and will provide direction, advice and examination of the student's work and achievement. For additional information, graduate program coordinator.

Financial Assistance

Jun Zhang, Ph.D.
Industrial Engineering, Purdue University, 2006
Research Interests:
Lean manufacturing and logistics, Production planning and inventory control, Scheduling, Simulation optimization, Models and methodologies of stochastic optimization, Healthcare engineering, Facility design, Supply chain management, Artificial intelligence, Machine learning and data mining, Computer integrated manufacturing

Various types of financial assistance are available to graduate students, such as (but not limited to) student loans, scholarships, graduate assistantships, graduate tuition waivers, and part-time employment opportunities both on and off campus.

A number of well-qualified graduate students, upon recommendation from the department concerned, are employed either as teaching or research assistants by most academic departments of the university. There are a limited number of teaching assistantships in Industrial and Manufacturing Engineering available, which are normally assigned as support for classes with large enrollments and/or heavy laboratory content. Research assistantships are more common than teaching assistantships, and are offered when student capabilities and background experience match the needs of the project. While teaching assistantships are funded through the University, research assistantships are generally funded through externally-funded grants and contracts. In both cases, assistantships are considered as employment, and the graduate student should view these appointments as a job. The student's thesis or dissertation may or may not be in the area of their job duties for the assistantship.

Full assistantships are for half-time employment (20 hours per week). Tuition for all graduate credits, resident or nonresident, are waived for individuals officially appointed as research or teaching assistants. Student activity fees are not waived. Many assistantships are structured for less than that amount of work commitment. When a student is offered an appointment as a Graduate Research Assistant, the faculty and the department will carry the expectation that the student has made a full commitment to fulfill both the degree requirements and the job responsibilities.

International Agribusiness

Program and Application Information

Graduate Coordinator: Dr. Tom Wahl

Department Location: 500 Barry Hall

E-mail Address: ndsu.agribusiness@ndsu.edu

Telephone Number: (701) 231-7441

Degree(s) Offered: M.S.

Application Deadline: March 1

Test Requirements

GRE (all applicants not receiving their baccalaureate degrees from U.S. or Canadian universities and all applicants who wish to be considered for a graduate assistantship.)

English Proficiency Requirements

TOEFL iBT 79

IELTS 6

Program Description

Billions of dollars worth of food and farm products are traded each year on international markets. Food companies scour the globe for customers and suppliers. Policy makers actively promote expanded markets for their country's food producers. Global food and agricultural policies command intense debate in world trade forums. International agribusiness is an exciting and rewarding career!

Entering the world of international agribusiness requires not only a solid educational foundation, but one must also be comfortable with a variety of cultures, have international experience, and demonstrate a desire to learn foreign languages.

The International Agribusiness M.S. program offered by the Department of Agribusiness and Applied Economics at North Dakota State University provides both the academic training and the international experience required to excel in an international

Faculty

Cole R. Gustafson, Ph.D.
University of Illinois, 1986
Research Interests:
Renewable Energy and Agricultural Finance

Joleen Hadrich, Ph.D.
Michigan State University, 2009
Research Interests:
Production Ecnomics, Farm Business Management, Agricultural Risk Management, Econometrics

Robert Hearne, Ph.D.
University of Minnesota, 1995
Research Interests:
Natural Resource and Environmental Economics

Robert S. Herren, Ph.D.
Duke University, 1975
Research Interests:
Economic History, Labor, Money and Banking

Jeremy Jackson, Ph.D.
Washington University, 2008
Research Interests:
Microeconomics, Political Economy, Public Finance

Won W. Koo, Ph.D.
Iowa State University, 1974
Research Interests:
International Trade, Grain Marketing

agribusiness career. The program of study includes coursework in applied economics, quantitative methods, and international agribusiness strategy, management, finance, and marketing. The student will participate in an international experience. Three options are available for satisfying the international requirements for the program:

1. The student may participate in an international internship. Both paid and unpaid opportunities exist with international agribusiness companies, with government agencies, or with nonprofit organizations. The semester-long or summer internship can be arranged by the student or in cooperation with NDSU's Office of International Programs. Internship programs will be defined by the student and his or her major adviser, and approved by the Graduate Program Committee (GPC) and the student's supervisory committee.
2. Students may participate in graduate courses in business or agribusiness at an international university during a semester-long or summer study abroad program. Study abroad programs will be defined by the student and his or her major advisor, and approved by the GPC and the student's supervisory committee.
3. Students may select at least six additional credits of coursework offered at NDSU related to international business or agribusiness. Courses must be approved the student's supervisory committee as part of the student's program of study prior to enrollment in the courses.

Students complete the program by writing and defending their comprehensive study papers under the supervision of their graduate committee.

Ryan Larsen, Ph.D.
Texas A&M University, 2009
Research Interests:
Agricultural Finance, Risk Management

F. Larry Leistritz, Ph.D.
University of Nebraska, 1970
Research Interests:
Economic Development, Resource Economics

Siew Hoon Lim, Ph.D.
University of Georgia, 2005
Research Interests:
Production Economics, Transportation, Industrial Organization

Gregory McKee, Ph.D.
University of California, Davis, 2006
Research Interests:
Industrial Organization, Agribusiness, Cooperatives

Dragan Miljkovic, Ph.D.
University of Illinois, 1996
Research Interests:
Agricultural Prices, International Trade, Agricultural and Food Marketing and Policy

Frayne Olson, Ph.D.
University of Missouri, 2007
Research Interests:
Crop Marketing Strategies, Crop Supply Chain Management, Agricultural Contracting, Agricultural Risk Management

Timothy Petry, Ph.D.
M.S. Agricultural Economics, NDSU, 1973
Research interests.
Livestock marketing

Admissions Requirements

The Department of Agribusiness and Applied Economics graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, an applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. At the baccalaureate level, have earned a cumulative grade point average (GPA) of at least 3.0 or equivalent.
3. Have completed courses in intermediate microeconomics, calculus, and statistics.
4. Show potential to undertake advanced study and research as evidenced by academic performance and experience.
5. The department also requires Graduate Record Exam (GRE) and TOEFL scores from students who have not received their baccalaureate degree from U.S. or Canadian universities. Furthermore, the GRE is required of all applicants who wish to be considered for a graduate assistantship.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show potential for successful graduate study, may be admitted under a conditional status. Evidence must be provided showing that the applicant's potential is not adequately reflected by his/her record. After meeting the specified standards of performance set by the department, the student, in consultation with the major adviser, may request a change to full graduate standing.

It is desirable that students begin their program in the fall semester, although students may also begin their programs of study in January. Application for fall admission to graduate school should be as far in advance as possible, preferably by

Richard Rathge, Ph.D.
Michigan State University, 1981
Research Interests:
Demographic Analysis, Labor Force Analysis, Rural Community Research, and Population Impact Assessment

David Roberts, Ph.D.
Oklahoma State University, 2009
Research Interests:
Natural Resource and Environmental Economics, Econometrics, Production Agriculture

David M. Saxowsky, J.D.
The Ohio State University, 1979
Research Interests:
Agricultural Law

Saleem Shaik, Ph.D.
University of Nebraska, 1998
Research Interests:
Agriculture Policy and Risk Management, Agriculture Production Economics

Cheryl J. Wachenheim, Ph.D.
Michigan State University, 1994
Research Interests:
Agribusiness

Tom Wahl, Ph.D.
Iowa State University, 1989
Research Interests:
International Marketing and Trade, Agricultural Trade Policy, Marketing and Price Analysis

William W. Wilson, Ph.D.
University of Manitoba, 1980
Research Interests:
Commodity Marketing, Agribusiness, Industrial Organization

March 1 for international applicants to ensure visa documents will be completed for a fall matriculation.

Program of Study

Students pursuing a Master of Science in International Agribusiness must complete all core courses. Students select elective courses (with approval of their adviser and supervisory committee) to fulfill the remaining Graduate School credit requirements. The core requirements assure breadth and competence in key areas of knowledge and professional activity. Students participate in an international internship, a study abroad program, or select six additional credits of coursework at NDSU related to international agribusiness. The following courses, or their equivalent, constitute the core of the Master of Science program:

Core Courses:

AGEC 701 (1 credit) Research Philosophy
AGEC 741 (3 credits) Advanced Microeconomics
AGEC 744 (3 credits) Agribusiness I: Agricultural Product Marketing and Agribusiness Strategy
AGEC 746 (3 credits) Agribusiness II: Agrifinance and Commodity Trading
AGEC 797 (2 to 4 credits) Comprehensive Study or AGEC 798 Thesis (6 to 10 credits) for students who are on a departmental research assistantship.

Minimum of 6 credits from
ECON 610 Introduction to Econometrics
ECON 710 Advanced Econometrics
AGEC 739 Analytical Methods for Applied Economists
AGEC 711 Advanced Topics in Econometrics
Or other approved quantitative coursework.

A minimum of 12 credit hours of graduate level course work must be taken in the Department of Agribusiness and Applied Economics at NDSU.

Approved electives

A minimum of 30 credits is necessary to complete the M.S. in International Agribusiness. Credits beyond those required courses listed above may be met through a combination of internship credits, courses taken during an international study program, or NDSU international courses approved by the student's supervisory committee.

Managerial Logistics

Program and Application Information

Program Director: Dr. Denver Tolliver

Assistant to the Director of Educational Programs: Jody Bohn

Program Location: Upper Great Plains Transportation Institute

Email: **Jody.Bohn@ndsu.edu**

Telephone Number: (701)231-7938

Degree(s) Offered: M.M.L.

Application Deadline: May 1

Test Requirements

GMAT

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

Changing global environments pose great challenges for civilian and military logisticians alike. Response operations require huge amounts of material and personnel delivered in precise quantities and with precise timing. A key to meeting these challenges is a joint interdisciplinary approach to logistics.

The Master of Managerial Logistics program targets career military officers, Department of Defense civilians and other industry professionals.

The unique interdisciplinary nature of the program emphasizes:

- Supply chain management in the military and private sector
- Extending advanced supply chain planning across the enterprise
- Global supply chain management and the design of international logistics systems
- Change management in a turbulent global environment

Faculty

Magdy Abdelrahman, Ph.D.
University of Illinois-Urbana, 1996
Research Interests:
Characterization of Modified Asphalt Binders and Mixes; Pavement Maintenance and Rehabilitation Techniques; Performance-Related Specifications for Pavement Materials; Quality Control and Quality Assurance in Pavement Construction
Department: Civil Engineering

Donald A. Andersen, EngD
Texas A&M University, 1982
Research Interests:
Transportation, Pavements, Traffic Engineering
Department: Civil Engineering

Canan Bilen-Green, Ph.D.
University of Wyoming, 1998
Research Interests:
Quality and Reliability Engineering, Design and Auditing of Quality and Productivity Monitoring Systems, Statistical Modeling and Applications, Applied Operations Research
Department: Industrial and Manufacturing Engineering

John Bitzan, Ph.D.
University of Wisconsin-Milwaukee, 1997
Research Interests:
Transportation Economics
Department: Management, Marketing and Finance

- Enterprise resource planning within a global context

Admission Requirements

The Managerial Logistics master's program is open to qualified graduates of universities and colleges of recognized standing. To be admitted with full standing, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized learning.
2. Have shown the potential to undertake advanced study and research as evidenced by prior academic performance.
3. Have earned a cumulative grade point average of at least 3.0 or equivalent in all courses completed at the baccalaureate level. Students entering from a master's degree program must have earned a cumulative grade point average of at least 3.0 or equivalent in their graduate program.
4. Have a stated interest in transportation and the capability to conduct transportation research.
5. Students who are not born in the United States or Canada must submit a TOEFL examination score.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show satisfactory potential for graduate study, may be admitted conditionally. The conditional status may be changed to full graduate standing after the first or second semester of study, based on the student's academic performance.

Degree Requirements

The 12-month master's degree program in managerial logistics at North Dakota State University meets the National Logistics Curriculum which tailors to the Department of Defense's strategic goals of joint officer and civilian development and career

Jarret Brachman, Ph.D.
University of Delaware, 2006
Research Interests:
Al-Qaida Strategy, Counterterrorism, Transportation Security

Richard Gutkowski, Ph.D.
University of Wisconsin, Madison, 1974
Research Interests:
Structural wood systems, Bridge theory, Computational mechanics, Field testing of highway and railroad bridges, Experimental timber bridge systems, Composite wood-concrete systems, Bridge guard rail modeling and testing, Performance testing of roadway safety barriers, Composite repair of wood members
Department: Colorado State University, Department of Civil Engineering

Robert Hearne, Ph.D.
University of Minnesota, 1995
Research Interests:
Natural Resource and Environmental Economics
Department: Agribusiness and Applied Economics

Siew Hoon Lim, Ph.D.
University of Georgia, 2005
Research Interests:
Production Economics, Transportation, Industrial OrganizationDepartment: Agribusiness and Applied Economics

Jill Hough, Ph.D.
University of California-Davis, 2007
Research Interests:
Public Transportation, Travel Behavior, Built Environment, Accessibility and Mobility of Seniors
Department: Upper Great Plains Transportation Institute

education. The interdisciplinary nature of the program offers unique training opportunities not found elsewhere.

Degree requirements are in agreement with NDSU Graduate School requirements. Master of Managerial Logistics is a 12-month, 36 credit, advanced civil schooling resident program which meets all 12 points of the National Logistics Curriculum outlined by the U.S. Army Logistics Management College. An overall GPA of 3.0 or higher must be maintained.

Financial Assistance

The number of assistantships varies from year to year, depending on grants and the number of students in residence. Applicants are considered on the basis of scholarship, academic performance, and financial need. The application to The Graduate School, including the three letters of reference and official transcripts, is required to be considered for an assistantship. International students must also submit a TOEFL score. Graduate tuition is waived for students with assistantships.

Coursework

Enterprise Resource Planning
Transportation and Logistics
Crisis Analysis and Homeland Security
International Logistics Management
Advanced Supply Chain Planning
Technology Advances and Logistics
Organizational Change Management
Adaptive Planning in Logistics Systems
Contracting
Logistics Research Methods
Military Case Studies in Logistics

Joseph M. Jones, Ph.D.
University of Missouri, 1994
Field:
Marketing
Department: Management, Marketing, and Finance

Khaled Ksaibati, Ph.D.
Purdue University, 1990
Research Interests:
Pavement maintenance and rehabilitation, Utilization of recycled materials in highway construction,
Asset management systems, Safety of rural roads
Department: Civil Engineering

Brian Kalk, Ph.D.
North Dakota State University, 2007
Research Interests:
Energy Distribution, Urban Planning, Logistics Systems, Environmental Communications
Department: Criminal Justice and Political Science

Won Koo, Ph.D.
Iowa State University, 1974
Research Interests:
International Trade
Department: Agribusiness and Applied Economics

David K. Lambert, Ph.D.
Oregon State University, 1985
Research Interests:
Production Economics, Natural Resources
Department: Agribusiness and Applied Economics

Courses

The MML is an interdisciplinary program. All candidates are expected to take the same courses in proper sequence. The expected sequence of courses is shown in Table 1. Course descriptions are available below.

Table 1. Expected Sequence of Courses in MML Degree Program

No.	Course Title	Semester
TL711	Logistics Systems	Fall
TL715	Enterprise Resource Planning	Spring
TL719	Crisis Analysis and Homeland Security	Fall
TL721	International Logistics Management	Fall
TL723	Advanced Supply Chain Planning	Spring
TL725	Technology Advances and Logistics	Spring
TL727	Organizational Change Management	Fall
TL729	Adaptive Planning in Logistics Systems	Spring
TL735	Acquisition Contracts: Law/Management	Spring
TL731	Logistics Research Methods	Summer
TL733	Military Case Studies in Logistics	Summer
TL790	Transportation Graduate Seminar	Fall

Brenda Lantz, Ph.D.
Pennsylvania State University, 2006
Research Interests:
Commercial vehicle safety systems and analysis, supply chain, intelligent transportation systems for commercial vehicle operations, and statistical modeling and diagnostics.
Department: Upper Great Plains Transportation Institute

Reza A. Maleki, Ph.D., PE, CMfgE
North Dakota State University, 1989
Research Interests:
Plant-wide Assessment, Manufacturing and Productivity Improvements, Rapid Product Development, Production Systems Design
Department: Industrial and Manufacturing Engineering

Peter Martin, Ph.D.
University of Nottingham, England, 1992
Research Interests:
Intelligent Transportation Systems, Traffic Signals
Department: University of Utah, Civil and Environmental Engineering

Subhro Mitra, Ph.D., P.E.
North Dakota State University, 2007
Research Interests:
Freight Travel Demand modeling, Urban Travel Demand Modeling, Asset Management and Life-Cycle Cost Study Optimizing Logistics Network, Economic Appraisal of Infrastructure Investment

Peter O'Dour, Ph.D.
University of Missouri-Rolla, 2004
Research Interests:
GIS, Groundwater contamination, Remote sensing
Department: Geosciences

Gary R. Smith, Ph.D.
Purdue University, 1986
Research Interests:
Quality Control and Systems Applications, Decision Analysis and Modeling Techniques, Safety Performance Measurement and Improvements, Labor Productivity
Department: Deans Office, Engineering and Architecture

Joseph Szmerekovsky, Ph.D.
Case Western Reserve University/Weatherhead School of Management
Research Interests:
Project management and scheduling, Complex systems and flexible manufacturing and using linear and nonlinear dynamic and integer programming and network flows
Department: Management, Marketing and Finance

Denver D. Tolliver, Ph.D.
Virginia Polytechnic University, 1989
Research Interests:
Transportation Systems Planning, Freight Transportation, Economic Analysis
Department: Upper Great Plains Transportation Institute

Rodney D. Traub, Ph.D.
Purdue University, 1994
Field: Operations Management
Department:

Kim Vachal, Ph.D.
George Mason University, 2005
Research Interests:
Policy, Economics, Regional Development
Department: Upper Great Plains Transportation Institute

Amiy Varma, Ph.D.
Purdue University, 1993
Research Interests:
Transportation Systems and Planning, Traffic Engineering, Airports, and Infrastructure Management
Department: Civil Engineering

Nadim Wehbe, Ph.D.
University of Nevada, Reno, 1997
Research Interests:
Reinforced and Prestressed Concrete Structures, Bridge Engineering, Earthquake-Resistant Bridges, Advanced Composites
Department: South Dakota State University, Department of Civil and Environmental Engineering

David L. Wells, Ph.D.
University of Missouri-Rolla, 1996
Research Interests:
International Studies in Manufacturing Technology, Strategic Management, Economic Development Strategies
Department: Industrial and Manufacturing Engineering

William W. Wilson, Ph.D.
University of Manitoba, 1980
Research Interests:
Commodity Marketing, Agribusiness, Industrial Organization
Department: Agribusiness and Applied Economics

Frank Yazdani, Ph.D., PE
University of New Mexico, 1987
Research Interests:
Structural Engineering/Mechanics, Constitutive Modeling of Materials, Damage Mechanics, Plasticity, Computational Plasticity, Finite Elements, Concrete and Masonry Materials
Department: Civil Engineering

Jun Zhang, Ph.D.
Purdue University, 2006
Research Interests:
Supply Chain Management, Models and Methodologies of Stochastic Optimization, Lean Manufacturing and Logistics, Healthcare Engineering, Scheduling
Department: Industrial & Manufacturing Engineering

Materials and Nanotechnology

Program and Application Information

Director: Dr. Erik Hobbie

Email: **Erik.Hobbie@ndsu.edu**

Telephone Number: (701)231-7049

Degree(s) Offered: Ph.D.

Application Deadline: February 1

English Proficiency Requirements

TOEFL ibT 71

IELTS 5.5

Program Description

North Dakota State University offers an interdisciplinary program leading to the Ph.D. degree in Materials and Nanotechnology (MNT). The program includes a series of required MNT core courses; additional elective courses; written and oral preliminary examinations; a doctoral dissertation based on independent, original research in the area of materials and nanotechnology; and a final oral examination of the dissertation.

Admissions Requirements

The Ph.D. program in Nanotechnology and Nanomaterials is open to qualified graduates of universities and colleges of recognized standing. To be admitted with full status the applicant must

1. Hold a baccalaureate or graduate degree from an educational institution of recognized standing. Students with a degree in the disciplines of chemistry, engineering, material science and engineering, physics, polymer science, polymer engineering, or related fields will be considered for admission.
2. At the baccalaureate or graduate level, have earned a

Graduate Faculty

Iskander Akhatov, Ph.D.
Lomonosov University of Moscow, 1983
Research Interests:
Fluid Dynamics, Multiphase Systems, Heat and Mass Transfer

Stefan Balaz, Ph.D. , D.Sc.
Slovak Technical University, 1986
Postdoctorals:
Institute for Experimental Biology and Medicine, 1988-89; University of Minnesota, Minneapolis, 1996
Research Interests:
Subcellular, Pharmacokinetics and Quantitative Structure-Time-Activity Relationships

Nikita Barabanov, Ph.D.
University of Kiev, 1979
Research Interests:
Differential Equations, Control Theory, Optimization, Neural Networks.

Achintya N. Bezbaruah , Ph.D.
University of Nebraska-Lincoln (UNL), 2002
Research Interests:
Environmental sensors, Recalcitrant and micro pollutants, Contaminant fate and transport, Small community water and wastewater treatment, Environmental management

cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent. Students with a previous graduate degree with a GPA of 3.0 or equivalent may be admitted in full standing.

3. Submit scores for the general Graduate Record Examination (GRE).

Financial Assistance

Students are routinely supported through research assistantships. Applicants are considered on the basis of scholarship, potential to undertake advanced study and research, and financial need. All students who submit complete applications by the appropriate deadlines are considered for assistantships. Exceptional students are also eligible for university fellowships that are awarded on a competitive basis.

Degree Requirements

By the end of the first academic year, the student will select an academic adviser from among the MNT faculty and arrange for the appointment of a Graduate Advisory Committee. This committee will consist of at least four members of the graduate faculty. This includes the student's major adviser, at least one additional MNT faculty member, and an appointee of The Graduate School.

The Plan of Study will be prepared by the student, in consultation with the major adviser, by the end of the first year in residence. The plan shall be approved by the student's Graduate Supervisory Committee, the MNT Program Director, and the Graduate School dean. The Plan of Study must be filed in the Graduate School prior to scheduling the comprehensive written examination.

Gordon P. Bierwagen, Ph.D.
Iowa State University, 1968
Research Interests:
Surface chemistry of coatings materials, corrosion, electrochemistry of coatings, coating lifetime prediction, concentrated random composites

Bret Chisholm, Ph.D.
University of Southern Mississippi, 1993
Research Interests:
Combinatorial chemistry methods for coatings, novel organic-inorganic coatings applications, new polyester nanocomposites

Davis Cope, Ph.D.
Vanderbilt University, 1980
Research Interests:
Partial Differential Equations, Numerical Methods, Applied Mathematics

Stuart G. Croll, Ph.D.
University of Leeds, 1974
Postdoctoral:
National Research Council, Canada
Research Interests:
Weathering durability of coatings, physical chemistry and suspension stability, pigment-polymer interactions, film formation processes, coating and polymer physics

Alan R. Denton, Ph.D.
Cornell University, 1991
Postdoctorals:
University of Guelph, 1991-94; Technical University of Vienna, 1994-95, Research Center Julich, 1996-98
Research Interests: Soft Condensed Matter Theory, Computational Physics

The Graduate School requires the Plan of Study for the Ph.D. degree to include not less than 90 semester graduate credits. Of this total, not less than 27 credits must be in courses other than seminar or research credits. Of the 27 course credits, 15 must be at the 700-789 level. The MNT Ph.D. program requires students to complete a series of 7 core courses totaling 17 semester credits. The student will complete additional elective courses to fulfill The Graduate School requirement of 27 semester credits in academic courses. An overall GPA of 3.0 or better must be maintained.

Course Offered

1. All students must complete the core curriculum which consists of:
   MNT 732 Electronic Properties of Materials 3 credits
   MNT 729 Materials Characterization 3 credits
   MNT 760 Materials Synthesis and Processing 3 credits
   MNT 730 Fundamentals of Nanotechnology 3 credits
   MNT 756 Molecular Modeling of Materials 3 credits
   MNT 745 Preparing Future Researchers 1 credit
   MNT 790 Graduate Seminar 1 credit

   2. Students must complete at least an additional 12 credits of graduate level coursework. The courses should be chosen by the students in consultation and with the approval of the student's committee. Suggested courses include the following

Suggested Courses in the Microelectronics Focus

ABEN 682 Instrumentation and Measurements 3 credits
CPM 796 Supramolecular Chemistry 2 credits
CHEM 766 Quantum Chemistry I 3 credits
CHEM 767 Quantum Chemistry II 3credits

Daniel L. Ewert, Ph.D.
University of North Dakota, 1989
Research Interests:
Biomedical Engineering

Thomas P. Freeman, Ph.D.
Arizona State University, 1968
Research Interests:
Plant Structure, Light and Electron Microscopy, Ultrastructure of Chloroplasts

Victoria Johnston Gelling, Ph.D.
North Dakota State University, 2001
Research Interests:
Corrosion control of active metal substrates by environmentally friendly coating, electroactive conducting polymers (ECPs) as corrosion inhibitors, electrochemical experimental techniques for the examination of coated substrates

Thomas Ihle, Ph.D.
Technical University Aachen, 1996
Research Interests: Theory and Simulation of Complex Fluids (Colloids, miroemulsions and Biopolymers).

Alan R. Kallmeyer, Ph.D.
University of Iowa, 1995
Research Interests:
Theoretical, Computational, and Experimental Solid Mechanics, Fatigue and Fracture of Engineering Materials, Composite Materials Technology, Composite Materials

ENGR780 Electromagnetic Theory 3 credits

ECE 751 Electromagnetic Theory and Applications 3 credits

IME 635 Plastics and Injection Molding Manufacturing 3 credits

IME 627 Electronics Manufacturing 3 credits

IME 720 Surface Engineering 3 credits

MN 735 Optoelectronic Materials Processing 3 credits

PHYS 771 Quantum Physics 3 credits

Suggested Courses in the Biomaterials Focus

ABEN 758 Applied Computer Imaging and Sensing Techniques for Biosystems 3 credits

BIOC 716 Biochemistry of Proteins and Enzymes 4 credits

BIOC 673 Methods of Biochemical Research 3 credits

CE 725 Introduction to Biomaterials: Materials in Biomedical Engineering 3 credits

CPM 771 Methods of Polymer Characterization 3 credits

CHEM 685 Industrial Biotechnology 2 credits

CHEM 665 Principles of Physical Chemistry and Biophysics 3 credits

ECE 685 Biomedical Engineering 3 credits

ECE 687 Cardiovascular Engineering 3 credits

MN 786 Tissue Engineering 3 credits

ME 694 Biomechanics 3 credits

MN 785 Biocompatibility Testing 3 credits

PSCI 611 Pharmacodynamics and Applied Theraputics 3 credits

PSCI 701 Quantitative Drug Design 2 credits

Suggested Courses in the Nanomaterials Focus

CE 783 Nanomechanics 3 credits

CE 641 Finite Element Analysis 3 credits

CHEM 767 Quantum Chemistry II 3 credits

CHEM 766 Quantum Chemistry I 3 credits

CPM 796 Nanomaterials Chemistry 3 credits

Ghodrat Karami, Ph.D.
Imperial College of Science and Technology, University of London, 1984
Research Interests:
Computational Solid Mechanics, Finite and Boundary Elements, Composite Micro and Nanomechanics, Continuum Mechanics, Structural Mechanics, Nonlinear and Large Deformation and Analysis, Thermoelastic Analysis.

Dinesh Katti, Ph.D.
University of Arizona, 1991
Research Interests:
Geotechnical Engineering, Constitutive Modeling of Geologic Materials, Expansive Soils, Multiscale Modeling, Steered Molecular Dynamics, Computational Mechanics, Nanocomposite, and Bio-nanocomposites. Computational Biophysics

Kalpana Katti, Ph.D.
University of Washington, 1996
Research Interests:
Advanced Composites, Nanomaterials, Biomaterials, Biomimetics, Materials Characterization and Modeling, Analytical Electron Microscopy, and Microspectroscopy, Bone Tissue engineering

Rajesh G. Kavasseri, Ph.D.
Washington State University, 2002
Research Interests:
Power Systems, Nonlinear Dynamics, Renewable Energy resources

Daniel M Kroll, Ph.D.
University of Chicago, 1973.
Research Interests: Theoretical and Computational Modeling of Complex Fluids and Biomembranes.

CPM 686 Corrosion and its Control by Coatings (cross-listed with CHEM) 2 credits

CPM 782 Physical Chemistry of Coatings 3 credits

CPM 673 Polymer Synthesis 3 credits

CPM 773 Organic Chemistry of Coatings 3 credits

IME 720 Surface Engineering 3 credits

ME 682 Fuel Cells 3 credits

ME 733 Nanocomposites and Functionalities

ME 734 Smart Materials/Structures 3 credits

ME 712 Advanced Finite Element Analysis 3 credits

PHYS 758 Statistical Physics 3 credits

PHYS 781 Solid State Physics I 3 credits

Suggested Courses in the General Materials Science and Engineering Focus

ABEN 658 Food Process Engineering 3 credits

ABEN 644 Transport Processes in Biological and Environmental Systems 3 credits

ABEN 658 Food Process Engineering 3 credits

ABEN 644 Transport Processes in Biological and Environmental Systems 3 credits

ME 673 Engineering Plastics for Design 3 credits

CE 641 Finite Element Analysis 3 credits

CE 720 Continuum Mechanics 3 credits

CHEM 732 Electrochemistry 3 credits

CHEM 736 Mass Spectroscopy 3 credits

CPM 673 Polymer Synthesis 3 credits

ME 751 Advanced Thermodynamics 3 credits

ME 633 Composites Science and Engineering 3 credits

PHYS 611 Optics for Scientists and Engineers 3 credits

PHYS 781 Solid State Physics I 3 credits

Ivan T. Lima Jr., Ph.D.
University of Maryland, 2003
Research Interests:
Photonics

Mohammad Mahinfalah, Ph.D.
Iowa State University, 1988
Research Interests:
Experimental Mechanics, Stress Analysis, Composite Materials, Fracture Mechanics

Valery R. Marinov, Ph.D.
Manufacturing Engineering, Technical University of Sofia, 1992
Research Interests: Process Modeling for Machining, Theory of Metal Cutting, Tribological Coatings, Including Nanocomposite Coatings and Deposition Methods, Design for Composites Manufacturing Processes, Packaging for low-cost disposable microelectronics, Direct-write material deposition methods, Laser processing

Sylvio May, Ph.D.
Jena, 1996
Research Interests:
Physics of Lipid Membranes, Biophysics

Seth C. Rasmussen, Ph.D.
Clemson University, 1994;
Postdoctoral, University of Oregon, 1995-1999
Research Area:
Inorganic/Organic Materials Chemistry, Chemical History

Mark J. Schroeder, Ph.D.
University of Texas, 1999

Douglas L. Schulz, Ph.D.
Northwestern University, 1993

Jing Shi, Ph.D.,
Industrial Engineering, Purdue University, 2004
Research Interests:
Microelectronics Packaging, Direct Write Material Depositing, Laser Processing for Electronics, RFID Applications, Numerical Modeling of Manufacturing Processes, Computer Integrated Manufacturing

Jagdish Singh, Ph.D.
Banaras Hindu University, 1982
Postdoctoral:
University of Otago, 1985-88; University of California--San Francisco, 1992-94
Research Interests:
Novel Dosage and Drug Delivery Systems, Biopharmaceutics

Dean D. Steele, Ph.D.
University of Minnesota, 1991
Research Interests:
Irrigation and Environmental Engineering

Wenfang Sung, Ph.D.
Institute of Photographic Chemistry, Chinese Academy of Sciences, 1995; Postdoctoral, University of Alabama, Birmingham, 1997-1999
Research Area:
Organic Materials Chemistry

Orven Swenson, Ph.D.
Air Force Institute of Technology, 1982
Research Interests:
Laser Sintering, Fiber Lasers, Optics

Dennis E. Tallman, Ph.D.
The Ohio State University, 1968;
Postdoctoral, Cornell University, 1968-1970
Research Area:
Electrochemistry, Materials

Alexander J. Wagner, Ph.D.
University of Oxford, 1997
Postdoctoral MIT, 1998-2000, Edinburgh, 2000-2002
Research Interests: Computational Soft Matter, Phase Separation, Diffusion, Interfaces Physics

Dean Webster, Ph.D.
Virginia Polytechnic Institute and State University 1984
Research Interests:
Synthesis of high performance polymers, polymerization reactions, crosslinking chemistry, and quantitative structure-property relationship

David L. Wells, Ph.D., C.Mfg.E.
Engineering Management, University of Missouri-Rolla, 1996
Research Interests:
Assembly of Micro and Nano Components, Printed Electronics, Process Engineering for Electronics Manufacturing, Advanced Manufacturing Processes, Product Realization, Application of RFID Technology, Quantitative Manufacturing Management, Advanced Manufacturing in Economic Development

Dennis P. Wiesenborn, Ph.D.
Rice University, 1989
Research Interests:
Food and Added Value Process Engineering

Frank Yazdani, Ph.D.
University of New Mexico, 1987
Research Interests:
Structures, Constitutive Modeling of Materials, and Continuum Mechanics

Weihong (Katie) Zhong, Ph.D.
Beijing University of Aeronautics and Astronautics, China, 1994
Research Interests:
Polymer and Composite Materials, Nanocomposites, Composite Processing Technologies, Mechanical, Electrical, and Thermal Properties of Materials.

Mathematics

Program and Application Information

Department Chair: Dr. Dogan Comez

Graduate Coordinator: Dr. Sean Sather-Wagstaff

Department Location: 300 Minard

Email: **Sean.Sather-Wagstaff@ndsu.edu**

Telephone Number: (701)231-8171

Degree(s) Offered: Ph.D., M.S.

Application Deadline: March 1

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Mathematics offers graduate study leading to the degrees of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.). Advanced work may be specialized among the following areas: algebra, applied mathematics, approximation theory, calculus of variations, combinatorics, differential equations, dynamical systems, ergodic theory, graph theory, harmonic analysis, number theory, operator algebras and topology.

Beginning with their first year in residence, students are strongly urged to attend research seminars and discuss research opportunities with faculty members. By the end of their second semester, students select an advisory committee and develop a plan of study specifying how all degree requirements are to be met. One philosophical tenet of the Department of Mathematics graduate program is that each mathematics graduate student will be well grounded in the two very basic areas of mathematics: algebra and analysis. To this end, each student's background will be assessed, and the student will be directed to the

Faculty

Azer Akhmedov, Ph.D.
Yale, 2004
Research Interests: Group Theory, Low Dimensional Topology

Maria Angeles Alfonseca, Ph.D.
Universidad Autonoma de Madrid, Spain, 2003
Research Interests:
Fourier Analysis, Partial Differential Equations

Nikita Barabanov, Ph.D.
University of Kiev, 1979
Research Interests:
Differential Equations, Control Theory, Optimization, Neural Networks

Marian Bocea, Ph.D.
Carnegie Mellon University, 2004
Research Interests:
Partial Differential Equations, Calculus of Variations, Mechanics of Deformable Solids

Catalin Ciuperca, Ph.D.
University of Kansas, 2001
Research Interests:
Commutative Algebras, Algebraic Geometry

Dogan Comez, Ph.D.
University of Toronto, 1983
Research Interest:
Ergodic Theory, Measureable dynamics, Operator Theory

appropriate level of study in these areas.

Admissions Requirements

The Department of Mathematics graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must:

1. Hold a baccalaureate degree (or equivalent) from an institution of higher education of recognized standing.
2. Have adequate preparation in higher mathematics, showing potential to successfully undertake advanced study and research as evidenced by academic performance and experience.
3. Have earned a cumulative grade point average (GPA) of at least 3.0 or equivalent in all advanced mathematics courses at the baccalaureate level. Students with a GPA of at least 3.0 or equivalent in a previous graduate degree program may be admitted in full standing.
4. In some of the requirements are not met, admission on a conditional status is possible in certain cases.

Financial Assistance

Teaching assistantships and a small number of research assistantships are available. Graduate tuition is waived for research and teaching assistants.

All students in full standing and, in certain situations, students in conditional status are eligible for assistantships.

International students must show proficiency in reading, writing, and speaking English. In particular, they must pass an oral proficiency interview, which is a Test of Spoken English (TSE) prior to receiving a teaching assistantship. This interview is the culmination of the five-week Intensive English Language

Davis Cope, Ph.D.
Vanderbilt University, 1980
Research Interests:
Partial Differential Equations, Numerical Methods, Applied Mathematics

James B. Coykendall, Ph.D.
Cornell University, 1995
Research Interests:
Algebraic Number Theory, Commutative Algebra, Ideal Theory, Dimension Theory, Factorization Theory and K-theory

Benton Duncan, Ph.D.
University of Nebraska, 2004
Research Interests:
Operator Algebras, Noncommutative Functional Analysis, K-theory

Robert Hladky, Ph.D.
University of Washington, 2004
Research Interests: Sub-Riemannian Geometry

Angela Hodge, Ph.D.
Purdue University, 2007
Research Interests:
Mathematics Education

Friedrich Littmann, Ph.D.
University of Illinois, Urbana, 2003
Research Interests:
Approximation theory, Number theory

William Martin, Ph.D.
University of Wisconsin, 1993
Research Interests:
Mathematics Education

Program (IELP) available each summer. An indication, but not a guarantee, of being able to pass this interview is a TOEFL score of at least 600 (paper test) or 247 (computer test). All international students applying from outside the United States for a teaching assistantship must expect to take the IELP.

Assistantship applications will be considered at any time. However, opportunities are improved for those received by the March 1 preceding the fall semester of intended enrollment.

Degree Requirements

At least one year of academic work must be spent in residence at NDSU in fulfilling graduate requirements for each graduate degree earned. The M.S. customarily takes two years to complete: the Ph.D. usually last three years beyond the master's. Students must maintain a cumulative GPA of at least 3.0 throughout their graduate career.

Master of Science

Two options are available: the Thesis Option and the Comprehensive Study Option. The Thesis Option emphasizes research and preparation of a scholarly thesis, whereas the Comprehensive Study Option emphasizes a broader understanding of a major area of Mathematics. Degree requirements include:

1. A total of 30 credit hours in approved graduate-level course work, depending on the degree option (see below). Subject to the approval of the supervisory committee, at most 6 of these 30 credits may be earned in 600-level mathematics courses (but NOT Math 620, 621, 650, or 651) or in courses in fields other than mathematics.

   Thesis option: A total of 6 to 10 credit hours of Math 798

James H. Olsen, Ph.D.
University of Minnesota, 1968
Research Interests:
Ergodic Theory, Probability Theory and Related Areas

Cristina Popovici, Ph.D.
Carnegie Mellon University, 2005
Research Interests:
Calculus of Variations, Partial Differential Equations, Mechanics of Deformable Solids

Sean Sather-Wagstaff, Ph.D.
University of Utah, 2000
Research Interests:
Commutative Algebra, Homological Algebra

Warren Shreve, Ph.D.
University of Nebraska, 1967
Research Interests:
Graph Theory, Combinatorics, Matrix Theory

Abraham Ungar, Ph.D.
Tel-Aviv University, 1973
Research Interests:
Differential Equations, Integral Transforms, Wave Propagation, Special Relativity

(Master's Thesis), in addition to 18 credit hours in courses numbered 700-789. These must include the two-semester sequences in Algebra (Math 720, 721) and Real Analysis (Math 750, 751).

Comprehensive Study Option: A total of 2 to 4 credit hours of Math 797 (Master's Paper), in addition to 24 credit hours in courses numbered 700-789. These must include the two-semester sequences in Algebra (Math 720, 721) and Real Analysis (Math 750, 751).

2. A passing grade in two written preliminary examinations chosen from Algebra, Applied Mathematics and Real Analysis.

3. Demonstrated proficiency in a computer programming language.

4. A thesis or expository paper written under the supervision of a faculty member and defended at an oral examination administered by the student's supervisory committee.

Doctor of Philosophy

Degree requirements include:

1. **A total of 90 credit hours in approved graduate-level course work, including:**
   - At least 42 credit hours in courses numbered 700-789 or as approved by the Graduate Program Director. These 42 credit hours must include the two semester sequences in Algebra (Math 720-721) and Analysis (Math 750-751). The advisor should in consultation with the graduate chair ensure that the 42 credit hours contain a broad spectrum of courses (at least 12 credit hours) outside the student’s area of emphasis as well as depth in a specific area of mathematics.
   - At least 3 credit hours of Math 790 (Graduate Seminar).
   - At least 6 credit hours of Math 799 (Doctoral Dissertation).

2. Subject to the approval of the advisory committee, at most 12 credits may be earned in 600-level mathematics courses (but NOT Math 620, 621, 650, or 651) or in courses in fields other than mathematics.

3. A passing grade in two written preliminary examinations chosen from Algebra, Applied Mathematics and Real Analysis.

4. Demonstrated proficiency in one foreign language commonly used in the mathematical literature, normally French, German, or Russian, as well as a demonstrated proficiency in a computer programming language. A student's advisory committee may require a second foreign language.

5. A passing grade in a preliminary oral examination administered by the student's supervisory committee after completion of the Preliminary Examinations and language requirements. A dissertation consisting of a written presentation of original and significant research completed by the student under the supervision of a faculty member and defended at a final oral examination administered by the candidate's supervisory committee.

6. A dissertation which must embody original work constituting a definite contribution to mathematical knowledge and demonstrate capacity for independent research, defended at a final oral examination administered by the candidate's advisory committee. Credits used to satisfy the requirements for a Master's degree at NDSU may be included in the total 90 credits required for the Ph.D.

Students entering the doctoral program with a Master's degree from another institution need only complete 60 credit hours, including:

- At least 30 credit hours in courses number 700-789 (but NOT Math 720, 721, 750, or 751).

Subject to the approval of the advisory committee, at most 6 credits may be earned in 600-level mathematics courses (but NOT Math 620, 621, 650, or 651) or in courses in fields other than mathematics.

All other requirements must be satisfied as above.

Veterinary and Microbiological Sciences

Program and Application Information

Interim Department Head: Dr. Neil Dyer

Graduate Coordinator: Dr. Eugene Berry

Department Location: Van Es Hall

Telephone Number: (701)231-7667

Degree(s) Offered: Ph.D., M.S.

Application Deadline: February 15 for fall, August 15 for spring

Test Requirements

GRE

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Veterinary and Microbiological Sciences offers graduate study leading to the M.S. degree in Microbiology and the Ph.D. degree in Molecular Pathogenesis. Faculty in the department offer expertise in pathogenic microbiology, virology, immunology, epidemiology, microbial genetics, bacterial physiology and food microbiology. The Master's in Microbiology emphasizes research methodology and laboratory techniques. The Ph.D. in Molecular Pathogenesis is a comprehensive program that integrates microbial genetics, mechanisms of pathogen-host interaction and cellular immunology to better understand the molecular basis of disease. Graduate students have access to state-of-the-art technology including automated DNA sequencing facilities, microarray capabilities and flow cytometry. NDSU's Biotechnology Institute includes a cell biology center and electron microscopy laboratory. Departmental faculty members also participate in the Cellular and Molecular Biology,

Faculty

Robert Barigye, Ph.D.
National Autonomous University of Mexico, 2003

Eugene S. Berry, Ph.D.
Northeastern University, 1983
Research Interests:
Animal virology, Molecular pathogenesis of ss(+) RNA viruses

Neil W. Dyer, D.V.M., M.S.
Iowa State University, 1991
Research Interests:
Studies with Bacillus anthracis, porcine pneumonia, new malignant catarrhal fever herpesvirus

Penelope S. Gibbs, Ph.D.
University of Georgia, 2001
Research Interests:
Avian E.coli, bacterial molecular pathogenesis, antimicrobial resistance, food safety.

Margaret L. Khaitsa, Ph.D.
Ohio State University, 1999
Research Interests:
Epidemiology, food safety.

Catherine M. Logue, Ph.D.
University of Ulster, 1996
Research Interests:
Food safety, food microbiology and foodborne pathogens of human concern

Genomics, Natural Resource Management and Food Safety graduate programs.

Admissions Requirements

1. A relevant bachelor's degree from an accredited institution and a strong academic record in the sciences.
2. A minimum grade point average of 3.0 on a 4.0 scale.
3. Graduate Record Examination (GRE)
4. Letters of Reference

Biology

One year of general biology with laboratory and one course in genetics are required.
At least one course is required in Cellular biology or Cellular physiology
Animal physiology
Bacterial physiology
Microbiology and immunology recommended.

Chemistry

One year of general chemistry with laboratory and two sequential terms of organic chemistry with a laboratory course are required.
Biochemistry is required.

Physics

Two sequential terms of physics with a laboratory course are required.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show potential for successful graduate study, may be admitted under a conditional status. However, evidence must be provided showing that the applicant's potential is not adequately reflected by his/her record. After meeting the specified standards of performance by the

John M. McEvoy, Ph.D.
University of Ulster, 2002
Research Interests:
Pathogenicity and virulence of Cryptosporidium

Birgit Pruess, Ph.D.
Ruhr-Universitat Bochum, Germany, 1991
Research Interests:
Global gene regulation in enteric bacteria, complex regulatory networks

Jane M. Schuh, Ph.D.
North Dakota State University, 2000
Research Interests:
Immunology; biomedical significance of the initiation and maintenance of allergic asthma; the innate immune response in health and disease; murine models of human asthma; Aspergillus fumigatus - induced immune response

Charlene E. Wolf-Hall, Ph.D.
University of Nebraska-Lincoln, 1995
Research Interests:
Food microbiology and toxicology

department, the student, in consultation with the major adviser, may request a change to full graduate standing. The student may not earn more than 12 semester credits of graduate credit in the conditional status. The request for change must be submitted to the Dean of the Graduate School by the major adviser and approved by the department chair.

Financial Assistance

The student must first apply to the Graduate School and be accepted in full or conditional status before he/she is eligible for an assistantship. Research and teaching assistantships are contingent upon availability of funds and are awarded competitively. Applicants are considered on the basis of scholarship, potential to undertake advanced study and research, and financial need.

Ph.D. in Molecular Pathogenesis

The Ph.D. in Molecular Pathogenesis encompasses the study of molecular pathogenesis of infectious and non-infectious diseases with an emphasis on animal diseases of agricultural importance, zoonotic diseases and public health. The comprehensive Doctoral degree in Molecular Pathogenesis integrates the study of microbial genetics, mechanisms of pathogen-host interaction, and cellular immunology to better understand the molecular basis of disease.

Doctoral candidates in Molecular Pathogenesis focus on research and utilize the expertise of one or more departmental faculty members. Course work is designed to be relevant to future careers in academia, industry, and government.

Degree Requirements

Degree requirements are in agreement with NDSU Graduate School requirements. The student and major adviser will prepare a plan of study by the end of the first year in residence. The Graduate School requires the plan of study for the Ph.D. degree to include no less than 90 semester, graduate credits. Of these, no less than 27 credits must be in courses other than seminar or research credits, and must include 15 credits at the 700-789 level. An overall GPA of 3.0 or higher must be maintained. The plan of study must include the following minimum number of credits in core subjects:

Molecular Studies (a minimum of 8 credits)*

- Bioc 701 Comprehensive Biochemistry I 4

- Bioc 702 Comprehensive Biochemistry II 4
- Bioc 719 Molecular Biology of Gene Expression and Regulation 3
- Biol 720 Advanced Cell Biology 3
- Micr 680 Bacterial Physiology 3
- Micr 682 Bacterial Genetics and Phage 3
- Micr 781 Advanced Bacterial Physiology 3
- Micr 783 Advanced Bacterial Genetics and Phage 3
- PlSc 631 Intermediate Genetics 3

Technique Courses (a minimum of 5 credits)*

- Bioc 673 Methods of Biochemical Research 3
- Bioc 674 Methods of Recombinant DNA Technology 3
- Micr 645 Animal Cell Culture Techniques 2
- Micr 661 Pathogenic Microbiology Lab 2
- Micr 671 Immunology and Serology Laboratory 2
- Micr 782 Molecular Microbiological Techniques 3

Pathogenesis (a minimum of 9 credits)*

- Micr 653 Food Microbiology 3
- Micr 660 Pathogenic Microbiology 3
- Micr/Safe 664 Etiology of Foodborne Illness 3
- Micr 665 Fundamentals of Animal Disease 3
- Micr 670 Basic Immunology 3
- Micr/Safe 674 Epidemiology 3
- Micr 675 Animal Virology 3
- Micr/Safe 750 Advanced Topics in Epidemiology 3
- Micr/Safe/CFS 752 Advanced Food Microbiology 3
- Micr 762 Advanced Pathogenic Bacteriology 3
- Micr 770 Immunology of Chronic Infections 3
- Micr 775 Molecular Virology 3
- Micr 785 Pathobiology 3

* Additional courses may be offered.

The core courses must be completed before the student takes the oral or written preliminary examination, whereas elective classes can be completed any time prior to the defense of the written dissertation. Each student will present one seminar each academic year throughout the program.

Examinations

Both a written and an oral, comprehensive, preliminary examination must be successfully completed to admit the student of candidacy for the Doctoral degree. These examinations should be taken no later than the end of the third year in residence. The written examination will consist of an approved, non-thesis research proposal written by the student in the format of a National Institutes of Health, National Science Foundation, or USDA postdoctoral fellowship proposal. Questions on the oral exam will be based upon the written proposal and upon graduate course work. After successful completion of the comprehensive written and oral preliminary examinations, the student will be formally admitted to candidacy for the Doctor of Philosophy degree.

Dissertation Research

In addition to the defense of the written dissertation in the final oral examination, the candidate will present a final public seminar based on the dissertation research. At least one academic semester, and preferably two semesters, shall elapse between the preliminary examinations and the oral defense of the research-based dissertation.

M.S. in Microbiology

A Master's degree in Microbiology at NDSU emphasizes research methodology and laboratory techniques. Student research and academic programs are individually tailored to meet the needs and interests of each student. Graduates are prepared for positions in research or commercial laboratories or for further graduate study.

Students shall select a major adviser by the end of the first semester in residence. By the end of the first year in residence, the student and major adviser will select a supervisory committee. Students are encouraged to visit with each faculty member and spend time in each laboratory to acquaint themselves with the department's research programs.

Degree Requirements:

The Master's program requires 24 months of full-time study, completing a minimum of 30 semester credits with an overall GPA of 3.0 or better. Students with inadequate undergraduate training in microbiology will be required to complete undergraduate courses in microbiology in addition to the required minimum 30 semester credits.

The M.S. degree in microbiology requires a research-based thesis, a public seminar of the thesis research, and a final oral defense of the thesis. The supervisory committee administers the oral thesis examination.

Music

Program and Application Information

Department Chair: Dr. John Miller

Graduate Music Coordinator: Dr. Jo Ann Miller

Department Location: 115 Music Education Building

Telephone Number: (701)231-7932

Degree(s) Offered: D.M.A., M.M.

Application Deadline: February 15 for fall, August 15 for spring

Links

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Music offers two graduate degrees: the Master of Music and the Doctor of Musical Arts. Each degree offers tracks in Performance and Conducting.

Graduate study in music requires evidence of significant accomplishment at an undergraduate level, and equally significant musical and scholarly potential for advanced study. Accordingly, candidates for admission must

1. Hold a baccalaureate degree from a recognized institution or an equivalent international performance certificate, and demonstrate evidence of academic and communication skills that will ensure success at the graduate level.
2. Demonstrate evidence of outstanding graduate-level musical ability or potential through an audition and interview process. This will include a performance audition and diagnostic examinations in music history and theory.
3. As a result of the diagnostic examinations, additional course work or independent study may be required.

Faculty

Andrew Froelich, Professor, D.M.A.
Michigan State University, 1988

Robert Groves, Professor, Ph.D.
University of Iowa, 1981

Robert Jones, Associate Professor, D.M.A.
University of Oklahoma, 1991

Kyle Mack, Associate Professor, D.A.
Ball State University, 1992

Jo Ann Miller, Associate Professor, D.M.A.
University of Cincinnati, 1989

John Miller, Professor, Ph.D.
Northwestern University, 1991

Neil Mueller, Associate Professor, D.M.A.
Boston University, 1999

Warren Olfert, Associate Professor, Ph.D.
Florida State University, 1992

Matthew Patnode, Associate Professor, D.M.A.
Arizona State University, 1999

Michael Thrasher, Assistant Professor, D.M.A.
University of North Texas, 1997

Michael Weber, Associate Professor, D.M.A.
University of Arizona, 1990

Virginia Sublett, Associate Professor, D.M.A.
University of California, 1997

Applicants should prepare general NDSU Graduate School forms available in the front of this publication and arrange for an interview/audition through the Graduate Music Coordinator, Dr. Jo Ann Miller, at 701-231-7932 or Jo.Miller@NDSU.edu.

Financial Assistance

Assistantships are awarded to outstanding candidates after formal application to the Graduate School. Assistantship areas include Vocal Performance, Choral Studies, Instrumental Performance, Instrumental Ensembles, and Keyboard Studies. Graduate tuition is waived for students with assistantships.

Degree Requirements

Master of Music Degree (M.M.)

The M.M. is the professional master's degree in music designed for three kinds of musicians: 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.

Students in the D.M.A. program may receive the M.M. after completion of the requirements listed below, and all work taken in the M.M. may apply to parallel tracks in the D.M.A.

Recitals and a final written project are planned in conjunction with the candidate's committee, which consists of at least three graduate faculty members: the adviser, a representative from academic studies, and at least one other member at large.

All course work must be passed with a minimum grade of B. Comprehensive examinations in the student's primary focus area and in academic studies must be passed near the end of or after course work, and prior to a final oral examination by members of the candidate's committee.

Two tracks are offered: Performance and Conducting. Each requires a minimum of 30 credits.

Master of Music in Performance (30 credits)

Musc 731 Applied Study 8
Musc 780 Recital 4
Musc 748 Music Bibliography and Research Methods 2
History/Theory: To be taken from
Musc 611, 630, 631, 734, 740, 741, 742, 743, 744 3
Musc 721 or 722 Vocal or Instrumental Pedagogy 2
Musc 709 Ensemble Performance 3
Musc 796 Special Topics (Repertoire) 3
Electives (in consultation with adviser) 5

Master of Music in Choral Conducting (32 credits)
Musc 731 Applied Study 8
Musc 780 Recital 4
Musc 748 Music Bibliography and Research Methods 2
History/Theory:
To be taken from Musc 611, 630, 631, 734, 740, 741, 742, 743, 744 3 Literature: Two from
Musc 760, 761, 762, 763 (Choral Literature) 6
Musc 721 Advanced Vocal Pedagogy 2
Musc 731 Applied Piano or Voice 2
Musc 709 Ensemble Performance 2 Electives (in consultation with adviser) 3

Master of Music in Instrumental Conducting (32 credits)
Musc 731 Applied Study 8
Musc 780 Recital 4
Musc 748 Music Bibliography and Research Methods 2
History/Theory: To be taken from Musc 611, 630, 631, 734, 740, 741, 742, 743, 744 3
Literature: Musc 765, 766 (Band Literature) 6
Musc 731 Applied Study (Secondary Instrument) 2
Musc 709 Ensemble Performance 2
Electives (in consultation with adviser) 5

Doctor of Musical Arts (D.M.A.)

The 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.

Entering students in the vocal performance track are expected to have appropriate language proficiencies in French, German, and Italian. Remedial work may be required upon recommendation of the adviser and committee.

Recitals and a final written project are planned in conjunction with the candidate's committee, which consists of at least three graduate faculty members: the adviser, a representative from academic studies, and at least one other member at large.

All course work must be passed with a minimum grade of B. Qualifying examinations in the student's primary focus area and in academic studies must be passed near the end of or after course work, and prior to a final oral examination by members of the candidate's committee. All D.M.A. graduates must have reading proficiency in at least one foreign language. For some, an alternative such as a computer language or other research skill, if appropriate to the student's focus area, may be substituted. This proficiency will be determined and assessed by the candidate's committee. Further, students in Choral Conducting must demonstrate appropriate proficiency in foreign language diction.

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 Musical Arts in Performance
Musc 731 Applied Study (4,4,4,4,4,4) 24
Musc 789 D.M.A. Thesis 4
Musc 780 Recital (4,4,4) 12
Musc 748 Music Bibliography and Research Methods 2
History/Theory: To be taken from
Musc 611, 630, 631, 734, 740, 741, 742, 743, 744 14
Musc 721 or 722 Vocal or Instrumental Pedagogy (2,2,2) 6
Musc 709 Ensemble Performance (1,1,1,1,1,1,1,1,1,1) 10

Musc 796 Special Topics (Repertoire) (3,3,3) 9
Electives (in consultation with adviser) 9

Doctor of Musical Arts in Conducting

Musc 731 Applied Study (4,4,4,4,4) 20
Musc 789 D.M.A. Thesis 4
Musc 780 Recital (4,4,4) 12
Musc 748 Music Bibliography and Research Methods 2
History/Theory: To be taken from
Musc 611, 630, 631, 734, 740, 741, 742, 743, 744 14
Musc 760, 761, 762 (Choral Literature) (3,3,3)
or
Musc 765, 766 (Band Literature) (3,3) 6-9
Musc 709 Ensemble Performance (1,1,1,1,1,1) 6
Cognate: Courses determined with adviser from
Conducting, Music Education, Performance 14
Electives (in consultation with adviser) 12

Natural Resources Management

Program and Application Information

Program Director: Dr. Carolyn Grygiel

Program Location: School of Natural Resource Sciences, Hultz Hall-Rm. 163

Email: **Carolyn.Grygiel@ndsu.edu**

Telephone Number: (701)231-8180

Degree(s) Offered: Ph.D., M.S.

Application Deadline: International applications are due May 1 for fall semester and August 1 for spring semester. Domestic applicants should apply at least one month prior to the start of classes.

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

Natural Resources Management (NRM) in the School of Natural Resource Sciences prepares students for the environmental challenges of the 21st century. The Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) NRM degrees are interdisciplinary curricula offering a broad, systems-based approach toward managing natural resources. NRM graduates are prepared to compete for and be productive in jobs where issues reach beyond a single discipline or subject area. They have the skills necessary to address problems from holistic-ecological and global-social perspectives.

Through the NRM graduate program, students gain a breadth of knowledge in relevant planning, analysis and management areas while developing thorough knowledge in one of the six following specialty areas:

Faculty

Allan C. Ashworth, Ph.D.
Professor of Geosciences,
University of Birmingham, England, 1969

Mario E. Biondini, Ph.D.
Professor of Range Sciences,
Colorado State University, 1984

William J. Bleier, Ph.D.
Professor of Zoology,
Texas Tech University, 1975

Francis Casey, Ph.D.
Associate Professor of Soil Science,
Iowa State University, 2000

Gary K. Clambey, Ph.D.
Associate Professor of Botany/Biology
Iowa State University, 1975

Gary A. Goreham, Ph.D.
Professor of Sociology,
South Dakota State University, 1985

Dr. Carolyn E. Grygiel,
Director, Natural Resources Management Interdisciplinary Program
School of Natural Resource Sciences,
Hultz Hall, North Dakota State University,
Fargo, ND 58105
701.231.8180

Biotic Resources Science deals with basic scientific principles that govern the interrelationship 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 communications 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/soils, and the impact of environmental pollution on the biotic factors.

Social Sciences concentrates on human factors (social, anthropological, political) in environmental management and environmental disaster management, while recognizing constraints and opportunities presented by physical and biological factors.

Robert Hearne, Ph.D.
Assistant Professor of Agricultural Economics,
University of Minnesota, 1995

Jay A. Leitch, Ph.D.
Professor of Agricultural Economics,
University of Minnesota, 1981

Mark Andrew Meister, Ph.D.
Assistant Professor of Communication,
University of Nebraska, 1997

Jack Norland, Ph.D.
Assistant Professor of Natural Resources Management North Dakota State University, 2008

G. Padmanabhan, Ph.D.
Professor of Civil Engineering,
Purdue University, 1980

David A. Rider, Ph.D.
Associate Professor of Entomology,
Louisiana State University, 1988

Dean D. Steele, Ph.D.
Associate Professor of Agricultural and Biosystems Engineering
University of Minnesota, 1991

Joseph D. Zeleznik,
Extension Forester,
Michigan State University, 2001

Within each NRM specialty area are one or more curriculums of study developed in cooperation with the following NDSU academic programs and departments. Students select a curriculum and an adviser from one of these participating units:

- Agribusiness and Applied Economics
- Agricultural and Biosystems Engineering
- Biological Sciences (Botany and Zoology)
- Civil Engineering
- Communications
- Entomology
- Plant Sciences
- Range Sciences
- Earth and Climate Science
- Geosciences
- Soil Science
- Sociology/Anthropology/Emergency Management
- Veterinary and Microbiological Sciences
-

The educational objective of the NRM graduate program is to provide formal education in a chosen specialty area, introductions to other subject areas, appropriate course work in analytical methods, and research and writing experiences in the general area of environmental management. Problem recognition, definition, analysis and resolution are the ultimate learning objectives.

Admissions Requirements

The graduate program in Natural Resources Management is open to qualified graduates of universities and colleges of recognized standing. To be admitted to the program, the applicant must:

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in a specialty area and show potential to undertake advanced study and research as evidenced by academic performance and experience.

3. Have earned a cumulative grade point average (GPA) in all baccalaureate courses of at least 3.0 or equivalent. Students awarded a previous graduate degree with a GPA of 3.0 or equivalent may be admitted in full standing.

General Graduate Record Examination (GRE) scores may be recommended or required of students. Consult with the NRM Program Director.

TOEFL scores are required of all international applicants. Students should consult the participating academic unit regarding these requirements.

Financial Assistance

Both research and teaching assistantships may be available through the participating academic units. Application for financial aid must be made directly to a department. Applicants are considered on the basis of scholarship and potential to undertake advanced study and research. Limited scholarships are available. Contact the NDSU Student Financial Services office for information and applications.

Degree Requirements

To qualify for the M.S. degree, the candidate must satisfactorily complete a minimum of 30 semester units in their selected curriculum, an oral examination and a thesis or comprehensive study paper.

To qualify for the Ph.D. degree, the candidate must satisfactorily complete a course of study of not less than 90 semester units (including 30 semester units from the M.S. degree or equivalent), a written and an oral preliminary examination, a research-based dissertation, and an oral defense of the dissertation. In addition, the candidate presents a final public seminar based on the dissertation research.

For more specific information, please refer to the Natural Resources Management Graduate Student Guidelines available on the NRM Web site at **www.ag.ndsu.nodak.edu/nrm/**
NRM program courses are offered by NRM and the other participating academic units. These include:

Agribusiness and Applied Economics 670, 701, 711, 739, 741

Agricultural and Biosystems Engineering 664, 682, 758, 765

Agricultural Systems Management 654, 675

Anthropology 658, 662, 680

Biology 680, 750, 776, 777

Botany 660, 671, 672, 720, 762, 764, 782

Civil Engineering 610, 621, 672, 673, 677, 678, 679, 768, 770, 775, 776

Computer Science 653, 658, 668, 728, 734, 737, 765

Economics 656, 661, 670, 672, 681, 741, 743

Entomology 610, 731, 732, 742, 750, 765, 770

Communications 636, 642, 643, 700, 711, 725, 755, 767, 785, 786

Geosciences 612, 613, 614, 628, 640, 650

Industrial and Manufacturing Engineering 640, 660

Microbiological Sciences 652, 654, 660, 661, 665, 674, 675, 750, 762, 770, 775, 785

Philosophy 681

Plant Pathology 655, 656

Plant Sciences 653, 665, 686, 724, 734, 753, 763

Political Science 620, 621, 642

Range Science 650, 652, 653, 656, 658, 660, 716, 717, 765

Sociology 603, 605, 610, 612, 613, 620, 622, 631, 639, 643, 645, 665, 700, 701, 723

Soil Science 610, 633, 644, 647, 665, 680, 721, 733, 755, 763, 782, 784

Statistics/Mathematics 660, 661, 662, 663, 725

Zoology 640, 652, 654, 656, 658, 660, 662, 670, 672, 674, 675, 676, 677, 682, 750, 760, 770

Pharmaceutical Sciences

Program and Application Information

Department Chair: Dr. Jagdish Singh

Department Location: Sudro Hall

Telephone Number: (701)231-7456

Degree(s) Offered: Ph.D., M.S.

Application Deadline: March 15 for fall semesters and October 31st, for spring semesters

Test Requirements

GRE (1100 or higher)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Department of Pharmaceutical Sciences offers graduate study leading to the Master of Science and Doctor of Philosophy degrees. Advanced work may be selected from pharmaceutics, pharmacokinetics, pharmacology, and medicinal chemistry.

The pharmaceutical sciences curriculum consists of a core of courses involving both basic and pharmaceutical sciences. In addition, students will select courses that will prepare them to be competent scientists in their fields.

Admissions Requirements

The Department of Pharmaceutical Sciences graduate program is open to all qualified graduates of recognized universities and colleges. To be admitted to the program with full status, the applicant must

Faculty

Stefan Balaz, Ph.D. , D.Sc.
Slovak Technical University, 1986
Postdoctoral: Institute for Experimental Biology and Medicine, 1988-89; University of Minnesota, 1996
Research Interests:
Subcellular, Pharmacokinetics and Quantitative Structure-Time-Activity Relationships

Satadal Chatterjee, Ph.D. (Physics)
University of Calcutta 1986
Postdoctoral: Department of Medicine, Case Western Reserve University, 1985-1989
Research Interests:
Developmental therapeutics pertaining to cancer and cancer chemoprevention

Bin Guo, Ph.D.
State University of New York at Buffalo, 1999.
Postdoctoral: Burnham Institute, 1999 - 2003
Research interests:
Molecular and cell biology of apoptosis; cancer pharmacology

Benedict Law, Ph.D.
University of Manchester, 2002
Postdoctoral : Massachusetts General Hospital/Harvard Medical School, 2002-2007
Research Interests:
Drug delivery, imaging, and nanotechnology

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in pharmacy or a biological or physical science related to pharmaceutical sciences.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) of at least 3.0 or equivalent.
4. GRE (Graduate Record Exam) test required.

Students who do not meet all admissions requirements, but show potential for successful graduate study, may be considered for admittance in a conditional status. Evidence must be provided showing that the applicant's potential is not adequately reflected by his/her record. After demonstrating adequate performance at North Dakota State University, the student, in consultation with the major adviser, may request a change to full graduate standing. The student may not earn more than 12 semester credits of graduate course work while in conditional status.

Financial Assistance

A limited number of assistantships are available. To be considered for an assistantship, the student must have completed a Graduate School application, be accepted by the department, and submit a formal letter to the department chair requesting an assistantship.

Degree Requirements

The Doctor of Philosophy program requires the completion of 30 semester credits of letter-graded course work with a GPA of 3.0 or better. Out of the 30 credits at least 18 credits must be at 700 level. Candidates defend their dissertations. Candidates for the Ph.D. will be required to take an examination directed at determining competency in the

Estelle Leclerc, Ph.D.
University Paris XI, 1994
Postdoctoral: ETH-Zurich (Switzerland): 1994-1998 The Scripps Research Institute, 1998-2003 ; Junior Group Leader Children's Hospital Zurich, 2004; Research Assistant Professor Florida Atlantic University , 2005-2009
Research Interests:
Biopharmaceutics

Sanku Mallik, Ph.D.
Case Western Reserve University, 1992
Postdoctoral: California Institute of Technology, 1993-95
Research Interests:
Synthetic medicinal chemistry

Stephen T. O'Rourke, Ph.D.
University of Wisconsin, 1985
Postdoctoral: Mayo Clinic and Foundation, 1985-87
Research Interests:
Vascular Pharmacology

Steven Qian, Ph.D.
The University of Iowa, 1999
Postdoctoral: National Institute of Environmental Health Science (NIEHS, NIH) 2000-2004
Research Interests:
Roles of lipid-derived and protein-derived free radical metabolites in all kinds of health related problems

R. Craig Schnell, Ph.D.
Purdue University, 1969
Provost and Vice President for Academic Affairs

pharmaceutical sciences.

Ph.D. is a preferred program in the Department of Pharmaceutical Sciences; however, limited admission is available in the MS program. The Master of Science program requires the completion of 17 semester credits of letter-graded course work with a GPA of 3.0 or better.

The department requires the following core courses:

PSci 611 Pharmacodynamics and Applied Therapeutics I
PSci 670 Pharmacokinetics
PSci 790 Graduate Seminar
Bioc 701 Comprehensive Biochemistry I
Bioc 702 Comprehensive Biochemistry II
Stat 725 Applied Statistics

For M.S. candidates, an oral defense of a research-based thesis and academic subject matter is required.

Jonathan Sheng, Ph.D.
State University of New York at Albany, 1998
Postdoctoral: University of Iowa 1998-2003
Research Interests:
Molecular pharmacology/toxicology; drug and xenobiotic metabolism

Jagdish Singh, Ph.D.
Banaras Hindu University, 1982
Postdoctoral: University of Otago, 1985-88; University of California--San Francisco, 1992-94
Research Interests:
Novel Dosage and Drug Delivery Systems, Biopharmaceutics

Chengwen Sun,M.D., Ph.D.
Norman Bethune University of Medical Sciences, 1983-1988
Immunology, Norman Bethune University of Medical Sciences, 1990-1996
Postdoctoral: Department of Physiology, Medical College of Wisconsin, 1996-2000
Research Interests:
Central blood pressure control and hypertension gene therapy

Stefan Vetter, Ph.D.
Swiss Institute of Technology (ETH), 1998
Postdoctoral: The Scripps Research Institute, 2000-2005
Research Interest:
Medicinal Protein Biochemistry

Erxi Wu, Ph.D.
Sheffield University, 1995-1998
Postdoctoral: Dana-Farber Cancer Institute/Harvard Medical School, 1998-2004
Faculty: Children's Hospital Boston/Harvard Medical School, 2005-2008
Research Interests:
Cancer therapeutic targets, drug discovery, natural products, blood biomarker for cancer

Physics

Program and Application Information

Department Chair: Dr. Daniel Kroll

Graduate Coordinator: Dr. Alexander Wagner

Department Location: 218 South Engineering

Telephone Number: (701)231-8974

Degree(s) Offered: Ph.D., M.S.

Application Deadline: March 1 for fall, September 1 for spring

Test Requirements

GRE required, Physics GRE strongly recommended

English Proficiency Requirements

TOEFL ibT 79 (non-teaching assitants), 81 (teaching assistants)

IELTS 6 (non-teaching assitants), 7 (teaching assistants)

Program Description

The Department of Physics offers graduate study leading to the M.S. and Ph.D. degrees. Advanced work may involve specialized training in the following areas: biophysics, computational physics, condensed matter, laser applications, optics, chemical physics, soft matter, statistical mechanics, physics education and polymer physics.

Research and academic programs are tailored to meet individual needs and interests. Soon after their arrival, new students are strongly urged to visit faculty members to discuss research opportunities.

Admissions Requirements

The Department of Physics graduate program is open to all qualified graduates of universities and colleges of recognized

Faculty

Landon Bladow, Ph.D.
North Dakota State University, 2009
Research Interests: Theoretical Chemical Reaction Dynamics, Quantum Chemistry

Warren Christensen, Ph.D.
Iowa State University, 2007
Research Interests: Physics Education Research, Student Content Understanding, Curriculum Development

Andrew Croll, Ph.D.
McMaster University, Ontario, 2009
Research Interests: Polymers, Diblock Copolymers, Thin Films, Pattern Formation, Mechanics

Stuart Croll, Ph.D. (adjunct)
University of Leeds, UK, 1974
Research Interests: weathering durability, film formation, internal stresses in films, modern art conservation, and history of paint technology

Alan R. Denton, Ph.D.
Cornell University, 1991
Postdoctoral, University of Guelph, 1991-94; Technical University of Vienna, 1994-95, Research Center Julich, 1996-98
Research Interests: Soft Condensed Matter Theory, Computational Physics

Ghazi Q. Hassoun, Ph.D. (emeritus)
University of Minnesota, 1963
Postdoctoral, University of Michigan, 1963-65
Research Interests: Foundations of Quantum Mechanics

standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in physics, showing potential to undertake advanced study and research as evidenced by academic performance and experience.
3. Have earned a cumulative grade point average (GPA) in all courses of at least 3.3 or equivalent at the baccalaureate level. The student with a GPA of 3.3 or equivalent in a previous graduate degree program may be admitted in full standing.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show potential for successful graduate study, may be admitted under a conditional status. Evidence must be provided showing that the applicant's potential is not adequately reflected by his/her record. After meeting the specified standards of performance by the department, the student, in consultation with the major adviser, may request a change to full graduate standing. The student may not earn more than 12 semester credits of graduate credit in the conditional status. The request for change must be submitted to the Dean of the Graduate School by the major adviser after approval by the department chair.

Applications should be submitted directly to the Graduate School before March 1 for admission in Fall Semester, and before September 1 for admission in Spring Semester. Early applications are encouraged. However, late applications may receive consideration.

Eric Hobbie, Ph.D.
University of Minnesota, 1990
Research Interests: Nanotechology, Nanoparticles, Polymers, Optics and Rheology

Thomas Ihle, Ph.D.
Technical University, Aachen, 1996
Postdoctoral, University of Paris, 1995-96; Grenoble 1997; University of Minnesota 1998-2000
Research Interests: Theory and Simulation of Complex Fluids Kinetic Theory, Pattern Formation)

Daniel M Kroll, Department Head, Ph.D.
Chicago, 1973
Research Interests: Theoretical and Computational Modeling of Complex Fluids and Biomembranes

Mila Kryjevskaia, Ph.D.
University of Washington, 2008
Research Interest: Physics Education

Andrei Kryjevski, Ph.D. (Adjunct)
University of Washington, 2004
Research Interest: High Energy Partical Theory, Nuclear Theory, First-Principles Numerical Techniques for Fermi Systems

Kenneth Lepper, Ph.D. (adjunct)
Oklahoma State University, 2001
Research Interests: Applied Solid state physics (geologic materials) and materials characterization

Sylvio May, Ph.D.
Friedrich-Schiller University, Jena, 1996
Research Interests: Physics of Lipid Membranes, Biophysics

The Graduate Record Examination (Subject and/or General Tests) is required for all applicants.

Financial Assistance

The student must apply to the Graduate School and be accepted in full or conditional status before being eligible for an assistantship in the Department of Physics.

Generally, graduate students are supported during the academic year by either teaching assistantships or research assistantships. The 2007-2008 academic year stipend was approximately $14,000 for 9 months. Additional support during the summer is also possible. Graduate tuition (except for student activity fees) is fully waived for all teaching assistants and research assistants.

Degree Requirements

Master of Science

The Graduate Advisory Committee shall assign to each incoming graduate student a temporary advisor, who shall assist in the selection of courses. By the end of the second semester, the student must choose a permanent advisor, who will guide the student in research, and establish an advisory committee.

Each student must earn at least 30 graduate credits, numbered 601-798, of which:

1. at least 10 credits are Physics courses numbered 601-689 or 700-789;
2. at least 16 credits are didactic courses numbered 601-689 or 700-789;

Konstantin Pokhodnya, Ph.D. (adjunct)
Morcow Institute of Science and Technology, 1977
Research Interests: materials, thin film fabrication, spintronics

Charles A. Sawicki, Ph.D. (Emeritus)
Cornell University, 1975
Postdoctoral, Cornell University, 1975-79
Research Interests: Acoustics, Biophysics, Geophysics

Mahendra K. Sinha, Ph.D. (Emeritus)
Pennsylvania State University, 1961
Postdoctoral, National Research Council (Ottawa), 1964-66
Research Interests: Field Emission and Field-Ion Microscopy

Orven Swenson, Ph.D.
Air Force Institute of Technology, 1982
Research Interests: Laser materials processing, optics education

Alexander J. Wagner, Ph.D.
University of Oxford, 1997
Postdoctoral MIT, 1998-2000, Edinburgh, 2000-2002
Research Interests: Computational Soft Matter , Phase Separation, Diffusion, Interfaces Physics

Gary D. Withnell, Ph.D. (adjunct)
North Dakota State University, 1980
Research Interests: Biophysics

3. between 6 and 10 credits are Physics 798 (Master's Thesis);
4. at least one credit must be Physics 790 Graduate Seminar.

IMPORTANT NOTE: Non-terminal Master's students who intend to pursue a PhD require 12 or more credits from Physics courses numbered 700-789.

Students are required to attend all seminars and colloquia. Each student must complete a plan of study soon after beginning thesis research. The student and advisor must agree upon two additional members of the Advisory Committee (in addition to the advisor). One additional member from outside the Physics Department will be appointed by the Graduate School, but suggestions can be made by the candidate.

Doctor of Philosophy

The Ph.D. program requires the completion of at least 90 graduate credits, numbered 601-799. Credits used to satisfy the requirements for the M.S. degree may be included in the total:

1. 27 or more must be in letter-graded courses
2. 19 are the required physics courses (655, 752, 758, 761, 771, 781, and 790).
3. No more than 12 credits are in non-physics courses.

By the end of the first year the student must select a graduate advisor and a thesis topic. At this point the student must submit a plan of study. The student and advisor must nominate two additional members for the Ph.D. Committee. One additional member will be appointed by the Graduate School. One person on the Committee must be from outside department.

Comprehensive examination: in the second half of their second year students:

1. hand in a report that summarizes their research results so far and details a research plan for the rest of their research work
2. give a talk about their research topic;
3. after their talk, an oral examination by their thesis committee has to be passed to confirm their doctoral status. This confirmation is a prerequisite for graduation.

If the student fails the comprehensive examination, she/he will be given the opportunity to repeat the examination in the next semester (this examination can be repeated only once). Alternatively, the student may elect to work for a Master's degree instead.

Students should submit their doctoral thesis for examination at the end of their fourth year.

For the comprehensive and final examinations, students must submit the appropriated forms to the Graduate School.

Research Equipment

The following equipment is available for research: global positioning system, picotesla magnetometry equipment, work stations; computer clusters, resources at the NDSU Center for High-Performance Computing; Nd:YAG , and titanium: sapphire lasers; immediate access to scanning electron microscope; low- and high-field NMR; and X-ray powder diffractometer, materials processing lasers and a full complement of materials characterization equipment through the NDSU Center for Nanoscale Science and Engineering.

Plant Pathology

Program and Application Information

Department Chair: Dr. Jack Rasmussen

Department Location: Walster Hall

Telephone Number: (701)231-8362

Degree(s) Offered: Ph.D., M.S.

Application Deadline: International applications are due May 1 for fall semester and August 1 for spring semester. Domestic applicants should apply at least one month prior to the start of classes.

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Department of Plant Pathology offers graduate study leading to the M.S. and Ph.D. degrees. Advanced degrees may involve specialized training in the following areas: host-parasite genetics, molecular biology and genomics, epidemiology, tissue culture, soil and seed-borne diseases, microbial ecology, and integrated disease management.

Student research and academic programs are tailored to individual needs and interests.

Five graduate faculty members are housed in the Northern Crops Science Laboratory located on campus. This relationship provides additional opportunities for research and consultation.

Admissions Requirements

The Department of Plant Pathology graduate program is open to all qualified graduates of universities and colleges of recognized

Faculty

Tika Adhikari, Ph.D.
International Rice Research Institute
University of the Philippines at Los Banos, 1991
Research Interests:
Plant Disease Epidemiology, Population Genetics, Genomics and Molecular Genetics of Host-Pathogen Interactions in Wheat

Samuel Markell, Ph.D.
University of Arkansas, 2007
Research Interests:
Extension Plant Pathology, Rust Diseases, IPM, Emerging Diseases, Chemical Control

Luis del Rio, Ph.D.
Iowa State University, 1999
Research Interests:
Canoloa Diseases Management and Control, Biological Control, Epidemiology and modeling

Timothy L. Friesen, Ph.D.
(USDA/ARS adjunct)
North Dakota State University, 2001
Research Interests:
Host Parasite Interactions of Foliar Diseases of Cereals

Michael C. Edwards, Ph.D.
(USDA/ARS adjunct)
Cornell University, 1983
Research Interests:
Virology, Cereal Virus Diseases

standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an accredited educational institution of recognized standing.
2. Have adequate preparation in Plant Pathology or Biology, and demonstrate potential to undertake advanced study and research as evidenced by academic performance and experience.
3. Have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent at the baccalaureate level. Students may be admitted conditionally if their GPA is 3.0 overall during the junior and senior years, or 3.0 in their major.

Financial Assistance

Research assistantships and part-time positions are available in the department. Applicants are considered on the basis of scholarship and potential to undertake advanced study and research. To be considered for an assistantship, a completed Graduate School application, official transcripts, and three letters of reference must be submitted. In addition to these materials, international applicants must also submit TOEFL scores. These items must be submitted to the Graduate School.

Degree Requirements

The program generally requires a minimum of two years of full-time study for the M.S. degree and three years of full-time study for a doctorate, during which an overall GPA of 3.0 or better must be maintained.

For M.S. candidates, an oral defense of a research-based thesis or paper, and academic subject matter is required. Candidates for the Ph.D. will be required to pass a preliminary written and

Thomas P. Freeman, Ph.D.
Arizona State University, 1968
Research Interests:
Plant Structure, Light and Electron Microscopy, Ultrastructure of Chloroplasts

Rubella Goswami, Ph.D.
University of Minnesota, 2005
Research Interests:
Dry Bean/Pulse Crop Pathology, Host-Pathogen Interactions, Fungal Biology, Molecular Biology and Genomics

Neil C. Gudmestad, Ph.D.
North Dakota State University, 1982
Research Interests:
Ecology and Epidemiology of Plant Pathogenic Bacteria, Foliar Diseases of Potato

Thomas J. Gulya, Ph.D.
(USDA/ARS adjunct)
Iowa State University, 1978
Research Interests:
Downy Mildew, Rust, Phomopsis Stem Canker, Sclerotinia Wilt of Sunflower

Mohamed Khan, Ph.D.
Clemson University, 1998
Research Interests:
Sugarbeet Management

Joseph M. Krupinsky, Ph.D.
(USDA/ARS adjunct)
Montana State University, 1977
Research Interests:
Plant Diseases Associated with Conservation Tillage-Crop Production Systems and Grasses

Marcia P. McMullen, Ph.D.
North Dakota State University, 1983
Research Interests:
Extension Plant Pathology, Management of Cereal Diseases, and IPM

oral examination covering academic subject matter and a final oral defense of a research-based dissertation. Programs of study are developed to meet both disciplinary requirements as well as special interests of the students.

Steven W. Meinhardt, Ph.D.
University of Illinois, 1984
Research Interests:
Structure/Function Relationships in Enzymes and Toxins

Stephen M. Neate, Ph.D.
University of Adelaide, 1985
Research Interests:
Management of Barley Diseases, Ecology of Fungal Pathogens of Cereals

Berlin D. Nelson, Ph.D.
Washington State University, 1979
Research Interests:
Oilseed Diseases, Biological Control, Mycology

Jack B. Rasmussen, Ph.D.
Michigan State University, 1987
Research Interests:
Molecular Biology and Role in Disease of Pathogen-Produced Toxins, Genetics of Resistance to Cereal Rust Diseases

Gary A. Secor, Ph.D.
University of California-Davis, 1978
Research Interests:
Potato Diseases Management and Control, Biotechnology for Cultivar Improvement

Carol E. Windels, Ph.D. (adjunct)
University of Minnesota, 1980
Research Interests:
Soybean Root Rot, Sugar Beet Soilborne Diseases, Taxonomy of Fusarium

Shaobin Zhong, Ph.D.
North Dakota State University, 2000
Research Interests:
Fusarium Head Blight of Wheat, Fungal Biology and Genetics, Genomics and Functional Genomics of Host-Pathogen

Psychology

Program and Application Information

Department Chair: Dr. Paul Rokke

Department Location: 44 Minard Hall

Telephone Number: (701)231-8622

Degree(s) Offered: Ph.D., M.S.

Application Deadline: February 15

Test Requirements

GRE

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Department of Psychology at North Dakota State University grants both M.S. and Ph.D. degrees. The doctoral program is in experimental psychology and is designed to prepare students for research and academic careers. There are two separate tracks within the Psychology master's degree program. Students may elect to pursue the experimental or clinical (behavior therapy) options.

Doctoral Program. Students enter the Ph.D. program with one of two emphases: Health and Social Psychology or Visual and Cognitive Neuroscience. These two areas represent the strengths of the department's faculty in experimental research, as well as two of the most active and cutting-edge areas of the field of psychology. The program accommodates 20 students, with approximately 4 new Ph.D. degrees awarded each year. Training in the program includes course work in the student's area of emphasis, as well as methods courses, breadth requirements, and research experience under the supervision of

Faculty

Terence W. Barrett, Ph.D.
University of North Dakota, 1989
Field:
Counseling; Issues in Therapy, Forensic Psychology

Benjamin J. Balas, Ph.D.
Massachusetts Institute of Technology, 2007
Field:
Brain and Cognitive Sciences

Barbara Blakeslee, Ph.D.
University of California, Santa Barbara, 1983
Field:
Biopsychology, Vision Science

Erin Conwell, Ph.D.
Brown University, 2009
Field:
Cognitive and Linguistic Sciences

James R. Council, Ph.D.
University of Connecticut, 1984
Field:
Clinical; Personality, Assessment, Clinical and Experimental Hypnosis

Scott G. Engel, Ph.D.
North Dakota State University, 2003
Field:
Health and Social Psychology; Obesity and Eating Disorders

Chris Kelland Friesen, Ph.D.
University of Alberta, 2001
Field:
Cognitive Neuroscience, Visual Attention, Social Perception and Attention

a faculty mentor. Training and experience in college-level teaching is an important part of the program. Student support is available through teaching assistantships, research assistantships, and teaching stipends.

Master's Program. Both master's tracks are designed to provide a broad background in general psychology and a firm grounding in research methodology. The clinical track of the program combines an emphasis on research with training and supervised practice in clinical behavior therapy skills. The program is suited for people who wish to pursue doctoral studies after receiving the M.S. or wish to work in a supervised practice setting immediately after graduation. The general cognitive-behavioral orientation integrates research and practice. Applied behavior analysis is an integral part of the program as are social learning and cognitive-behavioral approaches. Experiences and training are available in several subareas.

The general-experimental program stresses broad training in general psychology and involvement in research beginning early in graduate training. The program operates on a mentor system in which a student works closely with a primary faculty member in the student's chosen field of experimental psychology. The program is designed so that students satisfy a large amount of the general requirements the first year and acquire more specialized skills and training during the second year. The program prepares the student for doctoral studies in the experimental areas of psychology.

Students in both tracks have access to well-equipped research facilities and to faculty supervision time. (A favorable staff-to-student ratio is maintained.) The program requires 21 months of full-time study. Oral defense of a research-based thesis is required. The program is individualized, particularly in the

Robert D. Gordon, Ph.D.
University of Illinois at Urbana-Champaign, 1999
Field:
Cognitive Neuroscience, Attention, Representation, Visual Information Processing

Wendy P. Gordon, Ph.D.
University of Illinois at Urbana-Champaign, 2002
Field:
Child Development, Social Development and Peer Relations

Holly Hegstad, Ph.D.
University of North Dakota, 1999
Field:
Clinical; Psychology, Anxiety and Mood Disorders

Clayton J. Hilmert, Ph.D.
University of California, San Diego, 2003
Field:
Health and Social Psychology; Stress Psychophysiology, Cardiovascular Health, and Pregnancy

Verlin B. Hinsz, Ph.D.
University of Illinois, 1983
Field:
Social and Industrial/Organizational; Small Group Performance, Group Decision Making

Jessica T. Kaster, Ph.D.
University of South Dakota, 2004
Field:
Clinical; Psychology, Child Psychopathology, Assessment

second year, and students elect courses of special interest to them.

Admissions Requirements

The Department of Psychology graduate programs are open to qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the master's or doctoral programs, the applicant must

1. Hold a baccalaureate or graduate degree from an educational institution of recognized standing. Students may be admitted to the doctoral program at either the bachelor's or master's level.
2. Have adequate preparation in psychology and show potential to undertake advanced study and research as evidenced by academic performance and research experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent. Students with a previous graduate degree with a GPA of 3.0 or equivalent may be admitted in full standing.
4. To be competitive for admission, students should have GRE scores above the 50th percentile on the general subtests.

Applications are due by February 15 in order to receive full consideration for admission in the upcoming academic year. However, applications will be considered after this date to the extent that space in the program is still available. Three letters of recommendation are required before action is taken on any application. Personal reference report forms are available from the Graduate School.

Linda Langley , Ph.D.
University of Minnesota, 1998
Field:
Cognitive Neuroscience, Age-Related Changes in Selective Attention and Visual Search Performance

Kevin D. McCaul, Ph.D.
University of Kansas, 1978
Field:
Social; Health Behavior, Applied Social Psychology

Mark E. McCourt, Ph.D.
University of California -- Santa Barbara, 1982
Field:
Biopsychology, Vision Science; Visual Psychophysics, Neuropsychology

Mark Nawrot, Ph.D.
Vanderbilt University, 1991
Field:
Visual Neuroscience; Neural Mechanisms for Perception of Depth and Motion, Eye Movements, Alcohol

H. Katherine O'Neill, Ph.D.
University of North Dakota, 1991
Field:
Clinical; Psychopathology, Addiction, Anxiety

Brian Ostafin, Ph.D.
Boston University, 2004
Field:
Clinical; Implicit Cognition, Mindfulness, Addiction

Financial Assistance

Students are routinely supported through research and teaching assistantships. Applicants are considered on the basis of scholarship, potential to undertake advanced study and research, and financial need. All students who submit complete applications to the program by the appropriate deadlines are considered for assistantships. There is not a separate application for financial aid. Doctoral students are eligible for university fellowships that are awarded on a competitive basis.

Requirements for the Master's of Science in Psychology

The program requires 21 months of full-time study, during which 40 semester hour credits must be completed with an overall GPA of 3.0 or better. An oral defense of a research-based thesis is required.

All students must:

1. Complete an area paper in their field of specialization. The paper involves a literature review in a specific area and concludes with suggestions for future research. It should lead to a master's thesis proposal.
2. Complete a research-based thesis and pass an oral defense of the thesis administered by the student's supervisory committee.
3. Complete Psyc 640 Experimental Methods.
4. Successfully complete two Psyc core courses selected from two of the following three areas:
    (a) 660 Sensation and Perception, 665 Psychobiology, or 686 Neuropsychology;
    (b) 661 Memory and Knowledge, or 664 Attention and Thinking;

Stephane Rainville, Ph.D.
McGill University, 1999
Field:
Visual Neuroscience; Visual Synchrony, Multi-dimensional Optimization, Shape Perception, Form-Motion Interactions

Michael D. Robinson, Ph.D.
University of California, Davis, 1996
Field:
Social/Personality Affective Processes

Paul D. Rokke, Ph.D.
University of Houston, 1985
Field:
Clinical; Psychopathology

Clay Routledge, Ph.D.
University of Missouri-Columbia, 2005
Field:
Health and Social Psychology

Wolfgang Teder-Salejarvi, Ph.D.
University of Helsinki, 1994
Field:
Cognitive Neuroscience: Auditory & Somatosensory Attention, Crossmodal and Multisensory Interactions, Event-related Potentials (ERPs)

David A. Wittrock, Ph.D.
State University of New York at Albany, 1990
Field:
Clinical; Behavioral Medicine, Headache, Stress, Appraisal and Coping

More information on faculty background and interests is available on the department's homepage: www.ndsu.edu/ndsu/psychology

(c) 668 Personality, or 670 Experimental Social Psychology.

Experimental track students must:

1. Pass a methodology exam on research design and statistics.
2. Demonstrate competence in a skill area related to their main interest area.
3. Complete one clinical course.
4. Complete a third core course so that one core course is taken from each core area.

Behavior therapy track students must:

1. Complete a sequence in behavior therapy (Psyc 755-756).
2. Complete four required courses:

   Psyc 750 Introduction to Clinical Issues and Practices
   Psyc 770 Advanced Psychological Assessment
   Psyc 761 Applied Research Methods
   Psyc 672 Advanced Psychopathology,
   or Psyc 673 Child Psychopathology and /Therapy
3. Complete one approved elective.
4. Complete three semester credits of practicum during the first year and four semester credits of practicum during each semester of the second year.

Suggested Curriculum for Behavior Therapy Track

Year I-Fall

755 Behavior Therapy and Assessment I
770 Advanced Psychological Assessment or 761 Applied Research Methods Core Course
790 Graduate Seminar
750 Introduction to Clinical Issues and Practices
Core Course or Elective

Spring

640 Experimental Methods
756 Behavior Therapy and Assessment II
672* Advanced Psychopathology or 673* Child Psychopathology and Therapy
790 Graduate Seminar

795 Field Experience

Summer

Area paper, outline thesis

Year 2-Fall

770 Advanced Psychological Assessment

or 761 Applied Research Methods (both are required)

Practicum, thesis

Core Course or Elective**

Spring

Elective**

Practicum, thesis

*Only one of these two courses (672, 673) is required.

**Only one elective is needed and may be taken in any semester.

Elective Options (must be 600 or 700 level)

681 Health Psychology

782 Emotions

672 Advanced Psychopathology

or 673 Child Psychopathology/Therapy; other core courses; courses in Department of Child Development and Family Science, and/or other departments

Required Clinical Classes

Psyc 750, 755, 756, 761, 770, (672 or 673)

Requirements for Doctor of Philosophy in Psychology:

1. Complete a master's degree in Psychology. This may be done at NDSU or elsewhere.
2. Complete at least 90 hours of graduate credit, including those completed for the master's degree; 60 or more of these credits must be earned at NDSU. At least 30 credit hours must be in approved didactic courses, and at least 18 of these must be at the 700 level.
3. Complete quantitative and research methods courses (Psyc640 and 762, plus 761 for Health/Social track).

4. Complete core courses in specialty track:
    - Health & Social Psychology - four courses: Psyc 733, 771, 782, 787
    - Visual & Cognitive Neuroscience - three courses from Psyc 718, 720, 727, 731,760, 764).
5. Complete two (for Health/Social students) or one (for Visual/Cognitive students) breadth courses at the graduate level from area outside specialty track. (Can include approved courses from other departments).
6. Complete Psyc 790 (graduate seminar and colloquium series) each semester.
7. Participate in a continued program of research apprenticeship with at least one faculty member and, accordingly, enroll in Psyc 793 each semester for 1-5 credits.
8. Teach one undergraduate course under the supervision of a faculty member, after completion of Hum 702, Introduction to College Teaching in the Humanities and Social Sciences, or Biol 705/Educ705, Teaching College Science.
9. Complete a major area paper to serve as the comprehensive exam for Ph.D. candidacy. The area paper will be a comprehensive literature review of the student's area of research and will include an oral defense.
10. Complete the dissertation. The student will defend a written proposal before a faculty committee, conduct an original research project, and complete a comprehensive written report on the project. The student will complete a final oral defense before the same committee.

Range Science

Program and Application Information

Director: Dr. Donald Kirby, School of Natural Resource Sciences

Program Leader: Dr. Kevin Sedivec

Department Location: 106 Walster Hall

Email: **Kevin.Sedivec@ndsu.edu**

Telephone Number: (701)231-8901

Degree(s) Offered: Ph.D., M.S.

Application Deadline: April 15, but applications considered year-round

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Range Science program in the School of Natural Resource Sciences offers graduate study leading to M.S. and Ph.D. degrees. Advanced work may involve specialized training in the following areas: rangeland ecology, ecosystem science, vascular plant systematics, and natural resources management.

Student research and academic programs are tailored to individual student needs and interests. Interdisciplinary approaches to range science programs are fostered.

Admissions Requirements

The Range Science graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

Graduate Faculty

Mario E. Biondini, Ph.D.
Colorado State University, 1984
Research Interests:
Ecosystem Science , Use of Multivariate Statistics, Ecosystem Modeling , Theoretical Ecology , Landscape Ecology, Plant-Soil Relationships

Edward S. DeKeyser, Ph.D.
North Dakota State University, 2000
Research Interests:
Rangeland Ecology, Grazing Management, Wetland Ecology and Assessment

Amy Ganguli, Ph.D.
Oklahoma State University, 2005
Research Interests:
Invasive Plant Species Ecology and Management, Restoration of Native Ecosystem Structure and Function, Plant Community and Disturbance Ecology

Carolyn E. Grygiel, Ph.D.
MBA, CPRM
Colorado State University, 1983
Research Interests:
Landscape Ecology with Emphasis on Small Scale Disturbances, Prairie Restoration, Natural Resources Management

Kevin K. Sedivec, Ph.D.
North Dakota State University, 1994
Research Interests:
Grazing Systems and Upland Nesting Birds, Leafy Spurge Control Using Grazing, Range Animal Nutrition

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in range science or in a complementary area of natural sciences, have a background or interest in agriculture, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent.

Financial Assistance

Research assistantships are available. Applicants are considered on the basis of scholarship and potential to undertake advanced study and research. To be considered for an assistantship, a completed Graduate School application, official transcripts, three letters of reference, and a TOEFL score for international applicants must be submitted to the Graduate School no later than April 15.

Degree Requirements

The range science program has two options for the M.S. degree: the thesis option and the comprehensive study option. The M.S. program requires completion of 30 semester credits of approved graduate and letter-graded course work with an overall GPA of 3.0 or better. The Ph.D. program requires the completion of 90 semester credits (or the equivalent) of graduate approved and letter graded course work with an overall GPA of 3.0 or better.

Each student must choose an adviser, usually based upon area of academic and research interest, within the first program year. By the end of the first year of residence, the student must have selected an advisory/supervisory committee and have an approved graduate plan of study, including a research proposal. The advisory/supervisory committee advises the student and administers the graduate exams to the student. Students are referred to the Range Science Graduate Student Handbook for information regarding additional requirements.

Candidates for the M.S. normally complete their degree requirements in two years. Candidates for the Ph.D. generally complete their degree requirements in three to four years.

The M.S. candidates are required to take an oral examination which covers both the research and academic subject matter covered in their program. Candidates for the Ph.D. are required to take a preliminary written and oral examination directed toward the academic subject matter of their chosen discipline and a final defense of a research based thesis.

Social Sciences-Political Science

Program and Application Information

Department Head: Dr. Kevin Thompson

Graduate Coordinator: Dr. Robert Wood

Department Location: Criminal Justice and Public Policy Building

Email: **Robert.Wood@ndsu.edu**

Telephone Number: (701)231-8567

Degree(s) Offered: M.A., M.S.

Application Deadline: April 1

Test Requirements

GRE

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Department of Criminal Justice and Political Science offers both the M.A. and M.S. degrees in Social Sciences with a concentration in Political Science. The program serves students seeking to further their training in the scientific study of political activity for the purpose of pursuing careers in teaching, government service, interest group politics, or as preparation for doctoral studies. The program is designed to allow students to complete their substantive course work and exit requirement in two years.

Admissions Requirements

The Department of Political Science graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

Faculty

Thomas Ambrosio, Ph.D.
University of Virginia, 2000
Research Interests:
Ethnic Conflicts, International Relations, Russian Foreign Policy

Manjusha Gupte, Ph.D.
Purdue University, 2003
Research Interests:
Public Policy and Public Administration (Environmental Policy), Comparative Politics, Methodology and Forestry and Natural Resources

Kevin Thompson, Ph.D.
Department Chair
University of Arizona, 1986
Research Interests:
Criminal Justice

Robert A. Wood, Ph.D.
University of Missouri, 1983
Research Interests:
Terrorism, Judicial Politics

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in political science and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. Have earned an undergraduate cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent in the last sixty (60) credit hours of undergraduate study.
4. Submit Graduate Record Examination (GRE) scores and receive a minimum cumulative score of 1500 on all three sections.
5. Take the TOEFL examination if an international applicant. A minimum score of 600 (paper test) or 247 (computer test) must be achieved.

Financial Assistance

Both research and teaching assistantships are available. Applicants are considered on the basis of scholarship, potential to undertake advanced study and research, and financial need. To be considered for an assistantship, a completed Graduate School application, official transcripts, three letters of reference, and GRE scores must be submitted to the Graduate School no later than April 1. If applicable, TOEFL scores must be submitted by that date.

Degree Requirements

At least 30 semester credits of graduate work are required. Students must choose two of the department's four areas of specialization and, ultimately, will conduct original research culminating in a written master's thesis under the guidance of the major adviser.

Students must meet the following requirements:

- 6 credits of graduate methods courses (in consultation with advisor)
- 6 credits of 700-level science courses
- 6 credits of additional political science courses (600- or 700- level)
- 6 credits of additional 700-level courses (offered in political science or another discipline).
- 6 credits of Political Science 798 (Master's Thesis) plus a final oral defense.
- Additional requirements are as follows:
- 12 credits of graduate courses completed must be within 2 of the 4 political science areas of expertise.
- All political science graduate students must complete PolS 720 (counts toward the distribution above)

Sociology

Program and Application Information

Department Chair: Dr. Gary Goreham
Department Location: 107 Reinke Visual Arts Gallery
E-mail Address: ndsu.soc.anth@ndsu.edu
Telephone Number: (701) 231-8657
Degree(s) Offered: M.S.
Application Deadline: April 1
English Proficiency Requirements
TOEFL ibT 71
IELTS 6

Program Description

The Department of Sociology and Anthropology offers the M.S. degree in Sociology. This program is based on the principle that graduate level education in Sociology is a desirable preparation for a growing number of career orientations. Sample positions that our graduates have obtained include research analyst, instructor and human service worker. The precise plan of study for each student will be established in consultation with the academic adviser with the student's career goal in mind.

The focus of graduate education in Sociology is directed toward both the development of applied sociologists and the advanced training of those seeking to pursue a doctoral degree. Students may elect to take courses in a specialty area, or they may pursue a background in general sociology. Areas of specialization include medical sociology/gerontology and community development.

The Sociology graduate program provides students with the opportunity to expand their background and perspectives in research methods and theory. Consequently, the first year of the

Faculty

Chris Biga, Ph.D.
Washington State University, 2006
Research Interests:
Environmental Sociology, Social Psychology, Sociology of Aging

Gary A. Goreham, Ph.D.
South Dakota State University, 1985
Research Interests:
Rural Sociology, Community, Family, Research Methods, Sociology of Religion, Sociology of Agriculture

Lisa C. Hall, Ph.D.
University of Kansas, 2006
Research Interests:
Medical Sociology, Sociology of Aging

Daniel J. Klenow, Ph.D.
University of Notre Dame, 1977
Research Interests:
Special Populations, International Disasters, Emergency Management Theory and Methodology

H. Elaine Lindgren, Ph.D. (emeritus)
University of Missouri, 1970
Research Interests:
Social Change, Gender, Citizen Participation

Joy M. Query, Ph.D. (emeritus)
University of Kentucky, 1960
Research Interests:
Medical Sociology, Theory, Mental Health

Richard W. Rathge, Ph.D.
Michigan State University, 1981
Research Interests:
Demography, Applied Sociology, Rural Sociology, Research Methods

program is designed to expose students to theory and both quantitative and qualitative research methods.

Two program options are available for students. In the thesis option, students work on a research-based thesis. Students typically test theoretical assumptions using primary or secondary data. The comprehensive study option is designed for students who wish to combine their studies with some type of specialized field experience. Students electing this option are required to complete a comprehensive study paper related to their internship, such as evaluating a program.

Students in the Sociology graduate program benefit from a favorable faculty-to-student ratio.

Admissions Requirements

The Department of Sociology and Anthropology graduate program is open to qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in sociology and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average in all courses of at least 3.0 or equivalent and a grade point average of 3.2 or higher in sociology. Applications should be submitted directly to the Graduate School before April 1 of the upcoming academic year.
4. A letter of intent accompanying the application stating the area of research/focus the applicant is interested in.

Joy Sather-Wagstaff, Ph.D.
University of Illinois-Urbana-Champaign, 2007
Research Interests:
Cultural Anthropology, Visual Sociology, Race, Class and Gender

William Sherman, M.A. (emeritus)
University of North Dakota, 1965
Research Interests:
Great Plains, Sociology of Religion, Regional Studies

Kathleen Slobin, Ph.D. (emeritus)
University of California--San Francisco, 1991
Research Interests:
Medical Sociology, Sociological Theory, African Studies, Feminist Theory

Christina D. Weber, Ph.D.
Suny-Buffalo, 2005
Research Interests:
Social Theory, Feminist Theory, Sociology of Gender, Memory and Trauma Studies, Family

Christopher M. Whitsel, Ph.D.
Indiana University, 2009
Research interests:
Social Inequality, Research Methods, Global Comparative Sociology, Post-Soviet Central Asia

George A. Youngs, Ph.D.
University of Iowa, 1981
Research Interests:
Social Psychology, Research Methods, Sociology of Disasters, Emergency Management

Financial Assistance

Teaching assistantships are available to qualified applicants. Research assistantships may also be available, contingent on faculty research funds. Applicants for assistantships are considered on the basis of scholarship and potential to undertake advanced study and research. To be considered for an assistantship, a completed Graduate School application, official transcripts, and three letters of reference must be received by the Graduate School no later than April 1.

Degree Requirements

Students must complete a minimum of 30 credits and a master's thesis for the thesis option, or a minimum of 35 credits and a paper for the comprehensive study option. An oral defense of the thesis or the paper is required.

Requirements for the M.S. degree in sociology are as follows:

All students must

1. Successfully complete
   Soc 723 Social Theory
   Soc 700 Qualitative Methods
   Soc 701 Quantitative Methods
2. Complete an additional 21 credits (including thesis) or 26 credits (including comprehensive study).
3. Complete a research-based thesis or comprehensive study paper, and pass an oral defense of the thesis or paper administered by the student's supervisory committee.

Software Engineering

Program and Application Information

Department Head: Dr. Brian Slator

Software Engineering Admissions Coordinator: Dr. Kenneth Magel

Graduate Coordinator: Dr. Kendall Nygard

Department Location: 258 IACC

Email: **Kenneth.Magel@ndsu.edu**

Telephone Number: (701)231-8562

Degree(s) Offered: Ph.D., M.S., Certificate

Application Deadline: April 15

Test Requirements

GRE (recommended)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

Software Engineering is focused on the application of systematic, disciplined, and quantifiable approaches to the development, operation, and maintenance of software systems. Inclusive of computer programming but going well beyond, Software Engineering is concerned with methodologies, techniques, and tools to manage the entire software life cycle, including development of requirements, specifications, design, testing, maintenance, and project management. The advent of Software Engineering is a natural result of the continuous quest for software quality and reusability, and the maturing of the software development industry.

The Department of Computer Science offers a Graduate Certificate, M.S., and Ph.D. in Software Engineering. The programs are designed to appeal to both full-time students and

Faculty

Anne Denton, Ph.D.
University of Mainz, Germany, 1996
Research Interests:
Data Mining, Bioinformatics, Scientific Informatics, Educational Technology, Model Building, Databases

Hyunsook Do, Ph.D.
University of Nebraska, 2007
Research Interests:
Software Engineering, Software Testing, Maintenance, and Empirical Methodologies.

Xiaojiang (James) Du, Ph.D.
University of Maryland, 2003
Research Interests:
Wireless Sensor Networks, Mobile Ad Hoc Networks, Computer Networks, Network Security

Yan Gu, Ph.D.
Georgia Institute of Technology, 2007
Research Interests: Parallel and Distributed Simulations

Dean Knudson , Ph.D.
Northwestern University, 1972
Research Interests:
Software Development and Management

Jun Kong , Ph.D.
University of Texas, Dallas, 2005
Research Interests:
Software Engineering; Human-Computer Interaction; Model Management

software professionals who are employed and wish to pursue a program part time. Minimum qualifications for admission are the same as those specified for advanced degrees in Computer Science. For additional information, see www.cs.ndsu.nodak.edu or contact the Director of Software Engineering (701) 231-8189. For a complete listing of courses and faculty, please refer to the Computer Science section.

Admissions Requirements

Certificate

1. B.S. or equivalent degree from an accredited university;
2. Twelve semester hours or equivalent of Computer Science or Software Engineering courses from an accredited university, or at least one year full-time professional software engineering experience;
3. Programming skill in a modern higher level programming language, preferably C++, C#, or Java.

Master of Science

1. B.S. or equivalent degree from an accredited university with at least a 3.0 grade point average on a 4.0 scale. Full-time professional experience may offset this GPA requirement at the rate of 0.1 in GPA for each eighteen months of such experience to a maximum of 0.4 in GPA;
2. Eighteen semester hours or equivalent in Computer Science from an accredited institution, or at least two years of full-time professional software engineering experience;
3. Programming skill with one modern higher level programming language, preferably C++, C#, or Java.

Kenneth Magel, Ph.D.
Brown University, 1977
Research Interests:
Software Engineering, Human-Computer Interfaces, Computer Networks, Subsymbolic Computation

John Martin, Ph.D.
Rice University, 1971
Research Interests:
Theoretical Computer Science, Theory of Computation

Kendall Nygard, Ph.D.
Virginia Polytechnic Institute and State University, 1978
Research Interests:
Electronic Commerce, Software Agents, Operations Research, Sensor Networks, Artificial Intelligence

William Perrizo, Ph.D.
University of Minnesota, 1972
Research Interests:
Distributed Database Systems, Centralized Database Systems

Brian Slator, Ph.D.
New Mexico State University, 1988
Research Interests:
Artificial Intelligence, Educational Games

Vasant Ubhaya, Ph.D.
University of California-Berkeley, 1971
Research Interests:
Algorithm Analysis, Operations Research

Dianxiang Xu, Ph.D.
Nanjing University, China, 1995
Research interests:
Software Engineering, Software Security, Applied Formal Methods, Testing, Software Agents

Doctor of Philosophy

1. B.S. or equivalent degree from an accredited university with at least a 3.25 grade point average on a 4.0 scale. Significant full-time software development professional experience may offset this GPA requirement at the rate of 0.1 in GPA for each two years of such experience to a maximum of 0.4 in GPA;
2. Eighteen semester hours or equivalent in Computer Science from an accredited institution, or at least three years of full-time professional software engineering experience;
3. Programming skill in at least one higher level programming language, preferably C++, C#, or Java.

Degree Requirements

Graduate Certificate

Requires 10 semester credit hours consisting of CSCI 713 Software Development Processes

Any two of the following five courses**:**
Computer Science 714, Software Project Planning and Estimation
CSCI 715 Software Requirements Definition and Analysis
CSCI 716 Software Design
CSCI 717 Software Construction
CSCI 718 Software Testing and Debugging

One CSCI 790 seminar in an appropriate area as approved by the student's adviser.
Examples include
a. Database Systems
b. Extreme Programming
c. Formal Methods in Software Engineering
d. Intelligent Agents

Weiyi (Max) Zhang, Ph.D.
Arizona State University, 2007
Research interests:
Computer Networks; Wireless Networks and Network Security

EMERITUS

Bruce Erickson, Ph.D.
Yale University, 1973
Research Interests:
Theoretical Computer Science, Graph Theory

Robert Gammill, Ph.D.
Massachusetts Institute of Technology

An extensive project of approximately one third of a semester incorporated into whichever of the above courses the student and her (his) adviser selected. The project may be job related. This project serves as the capstone experience for the student.

Sample Certificate Combinations:

Software Design: CSCI 713, 715, 716 + Seminar with project in 716

Software Testing: CSCI 713, 714, 718 + Seminar with project in 718.

Software Project Management: CSCI 713, 714, 715 + Seminar with project in 715.

Software Construction: CSCI 713, 716, 717 + Seminar with project in 716 or 717.

Other arrangements could be done as well.

Master of Science in Software Engineering

Program Requirements (33 semester hours)

1) Software Engineering Core (12 credits):
   Students must complete the core within five semesters of their entering the program.
   a) CSCI 713: Software Development Processes
   b) CSCI 765: Introduction to Database Systems
   c) CSCI 716: Software Design
   d) Either CSCI 715: Software Requirements Definition, or CSCI 718: Software Testing and Debugging. Each student selects one of these two courses.
2) The Software Engineering Comprehensive Examination. This examination shall include integrative questions on the four courses which make up the software engineering core (see 1 above). The exam must be passed within the first seven semesters of their program. Each student is allowed a maximum of two attempts to pass this examination. Students are encouraged to complete the comprehensive examination early in their program.
3) Six credits (not part of the core) from:
   a) CSCI 714 Software Project Planning and Estimation
   b) CSCI 715 Software Requirements Definition
   c) CSCI 717 Software Construction
   d) CSCI 718 Software Testing and Debugging
   e) CSCI 747 Software Complexity Metrics
   f) CSCI 745 Formal Methods for Software Development
   g) CSCI 746 Development of Distributed Applications

4) Nine credits of other Computer Science or Computer Engineering courses selected with and approved by the student's graduate advisory committee.
5) Three CSCI 790 graduate seminars in software engineering areas (1 credit each). These seminars must be approved in advance by the student's graduate adviser (a form is provided for this purpose).
6) A comprehensive study option (3 credits) paper based on a significant software development project undertaken by the student, perhaps as a member of a team, either at the University or as part of a job. This project will require design, implementation, and testing of a significant piece of computer software.
7) A Final Oral Examination on the paper and course work. This examination shall include questions on design choices, implementation methods, and testing choices for the student project.

Ph.D. in Software Engineering

Program Requirements (90 semester hours)

1) All M.S. course requirements (items 1,3,4, and 5 above) or their equivalent in transfer or examination credits.
2) CSCI 793 Software Development Project (6 semester hours). This course will require the design, implementation, and testing of a significant piece of computer software. This course must be completed successfully before the Qualifying Examination may be attempted. If a student successfully passed the M.S. in Software Engineering Comprehensive Examination at the Ph.D. qualifying level while earlier completing an M.S. at North Dakota State University, the student shall not need to take the Qualifying Examination, but this course must be completed successfully within the first two years of the Ph.D. program.
3) Satisfactory completion of the Ph.D. Qualifying Examination. This examination will consist of integrative questions on the four core courses described in (1) under the M.S. above. Students must complete this requirement within their first seven semesters of participation in the program.
4) Twelve hours of course work chosen from the courses listed below and not duplicating any items used to satisfy 1:
    a) CSCI 714 Software Project Planning and Estimation
    b) CSCI 715 Software Requirements Definition
    c) CSCI 716 Software Design
    d) CSCI 717 Software Construction

e) CSCI 718 Software Testing and Debugging
f) CSCI 747 Software Complexity Metrics
g) CSCI 745 Formal Methods for Software Development
h) CSCI 746 Development of Distributed Applications

5) Six hours of additional course work in Computer Science or Computer Engineering chosen by the student and his advisor and approved by the Student's Advisory Committee.
6) Thirty-six semester credit hours for research, preparation, and defense of a dissertation in Software Engineering. These hours will be graded on a Satisfactory/Unsatisfactory basis.

Additional course work requirements:

1. Beyond the M.S. degree, a maximum of 9 credits of course work can be transferred.
2. The 90 credits may include a maximum of 15 credits of non-didactic courses (independent studies and seminar hours). Seminars are limited to four of those credits.
3. The student's advisory committee, the department chair, and the graduate dean all must approve the course work on the plan of study at least two semesters before graduation

Soil Sciences

Program and Application Information

Director: Dr. Donald Kirby, School of Natural Resource Sciences

Program Leader: Dr. Frank Casey

Department Location: 106 Walster

Email: **Francis.Casey@ndsu.edu**

Telephone Number: (701)231-8901

Degree(s) Offered: Ph.D., M.S.

Application Deadline: March 15, but applications accepted year-round

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

The Soil Science Department in the School of Natural Resource Sciences offers graduate study leading to the M.S. and Ph.D. degrees that provide training in agricultural and/or environmental career tracks. The instructional and research programs emphasize an understanding of soil-plant-atmosphere interactions and their application to soil and water resource management. Students may pursue degrees with emphasis in soil chemistry, soil fertility, soil genesis and morphology, soil management, soil physics, environmental modeling, water quality, soil salinity, plant nutrition, soil survey, soil conservation, soil reclamation, soil mineralogy or agricultural climatology and meteorology. M.S. and Ph.D. programs in Natural Resources Management and Environmental and Conservation Science with emphasis in soil science are also available.

A close working relationship exists between the department and various state and federal agencies. Strong supporting course

Faculty

F. Adnan Akyuz, Ph.D.
University of Missouri-Columbia, 1994
Research Area/Activity: Applied Climatology and Microclimatology/Climate Based Agricultural Management

Francis X.M. Casey, Ph.D.
Iowa State University, 2000
Research Area/Activity:
Field Oriented Soil Physics, Measurement and Prediction of Water Transfer and Chemical Transport Through Soil

Larry J. Cihacek, Ph.D.
Iowa State University, 1979
Research Area/Activity:
Erosion and Productivity Relationships, Conventional and Alternative Crop Management, Carbon Sequestration, Nutrient Management

Thomas M. DeSutter, Ph.D.
Kansas State University, 2004
Research Area/Activity:
Trace Elements, Land Application of Byproducts, Inorganic Soil Chemistry, Soil Environmental Conditions

David W. Franzen, Ph.D.
University of Illinois, 1993
Research Area/Activity:
Soil Fertility/State Soil Specialist

David G. Hopkins, Ph.D.
North Dakota State University, 1997
Research Area/Activity:
Interactions Among Landscape, Soil Morphology, Soil Properties and Environmental Aspects of Land Use

work is available from other departments and programs at North Dakota State University. Programs of study are designed to meet student interests and needs.

North Dakota's diversity of soils and agricultural practices provides an exceptional field setting in which to study soil science. The department is well equipped for field and laboratory investigations.

Admissions Requirements

The Soil Science graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing.
2. Have adequate preparation in soil science or related areas, and show potential to undertake advanced study and research as evidenced by academic performance and experience.
3. At the baccalaureate level, have earned a cumulative grade point average (GPA) in all courses of at least 3.0 or equivalent.

Preferably, applications should be submitted directly to the Graduate School before March 15 of the upcoming academic year. However, applications will be considered at any time they are submitted.

Financial Assistance

Research assistantships are available. Applicants are considered on the basis of scholarship, potential to undertake

R. Jay Goos, Ph.D.
Colorado State University, 1980
Research Area/Activity:
Soil Fertility and Management/Fertilizer Management for Small Grains

Dr. Don Kirby, Director,
School of Natural Resource Sciences
North Dakota State University, Fargo, ND 58105
701.231.8901
donald.kirby@ndsu.edu

Laura F. Overstreet, Ph.D.
North Carolina State University, 2005
Research Area/Activity:
Soil Conservation and Management, Sugarbeet Research

Lyle D. Prunty, Ph.D.
Iowa State University, 1978
Research Area/Activity:
Soil Physics/Nutrient Management and Measurement Under Irrigation, Simulation of Water and Chemical Movement

Allan W. Cattanach, Ph.D. (adjunct)
University of Minnesota, 1979
Research Area/Activity:
Soil Fertility, Sugarbeet Management

Gary H. Halvorson, Ph.D. (adjunct)
Oregon State University, 1979
Director of Agriculture, Sitting Bull College, Fort Yates, SD

Mark Liebig, Ph.D. (adjunct)
University of Nebraska, 1998
USDA-ARS Northern Great Plains Research Laboratory, Mandan, ND
Research Area/Activity:
Soil Quality, Soil Carbon Dynamics, Greenhouse Gas Flux, Semiarid Agroecosystems

advanced study and research, and financial need. To be considered for an assistantship, a completed Graduate School application, official transcripts, three letters of reference, and general GRE scores (as well as a TOEFL score for international applicants) must be received by the Graduate School.

Degree Requirements

The M.S. program normally requires 24 months of full-time study and research while the Ph.D. program normally requires a minimum of 36 months. An overall GPA of 3.0 or better must be maintained. An oral defense of thesis and academic subject matter is required of M.S. candidates. Ph.D. candidates are required to take a preliminary written and oral examination of academic subject matter and a final oral defense of a research-based dissertation.

Stephen D. Merrill, Ph.D. (adjunct)
University of California, Riverside, 1976
USDA-ARS Northern Great Plains Research Laboratory, Mandan, N.D.
Research Area/Activity:
Soil Erosion Processes; Crop Root Growth and Soil/Crop Hydrology; Mined Land Reclamation

Kristine Nichols, Ph.D.(adjunct)
University of Maryland, 2003
USDA-ARS Northern Great Plains Research Laboratory, Mandan, ND
Research Area/Activity:
Soil Microbiology and Aggregate Stability

Jimmie L. Richardson Ph.D. (adjunct)
Iowa State University, 1974
Research Area/Activity:
Soil Salinization, Soil Development in Wetlands, Hydrologic Patterns, Sedimentation

Stephan A. Schroeder Ph.D. (adjunct)
Purdue University, 1979
Environmental Scientist, North Dakota Public Service Commission, Bismarck, ND
Research Area/Activity:
Mine Inspections, Enforcement of State and Federal Mining Laws

James A. Staricka, Ph.D. (adjunct)
University of Minnesota, 1990
Williston Research Extension Center, Williston, ND
Research Area/Activity:
Soil and Water Conservation and Nutrient Use Efficiency in Dryland and Irrigated Crop Production

Donald L. Tanaka, Ph.D. (adjunct)
University of Nebraska, 1980
USDA-ARS Northern Great Plains Research Laboratory, Mandan, ND
Research Area/Activity:
Dryland Integrated Agricultural Systems, Soil and Crop Ecological Interactions

Statistics

Program and Application Information

Department Chair: Dr. Rhonda Magel

Department Location: Waldron Laboratory

Email: ndsu.stats@ndsu.edu

Telephone Number: (701)231-7177

Degree(s) Offered: Ph.D., M.S., Certificate

Application Deadline: March 15

Test Requirements

GRE (recommended)

English Proficiency Requirements

TOEFL ibT 79

IELTS 6

Program Description

The Department of Statistics offers programs leading to a Ph.D. in statistics or a master's degree in applied statistics. The program is flexible enough to be individually planned around prior experience and in accord with professional goals.

During the first year of the program, students are strongly encouraged to meet with each faculty member to discuss possible research topics. The student should select an advisory and examining committee by the end of the first year.

A joint master's degree in computer science and statistics may also be obtained.
A graduate certificate in Applied Statistics for non-majors is also offered.

Faculty

Fu-Chih Cheng, Ph.D.
North Dakota State University, 2003
Field:
Monte Carlo Simulations, Resampling Methods, and Design of Experiments

Seung Won Hyun, Ph.D.
University of Missiouri, 2010
Field:
Optimal Designs, Adaptive Designs, Clinical Trials

Rhonda Magel, Ph.D.
University of Missouri-Rolla, 1982
Field:
Nonparametrics, Inference Under Order Restrictions, Regression

Volodymyr Melnykov, Ph.D.
Iowa State University, 2009
Field:
Computational Statistics, Finite Mixture Models, Cluster Analysis, EM Algorithm

Gang Shen, Ph.D.
Purdue University, 2009
Mathematical Statistics, Asymptotic Theory, Bayesian Analysis, Change-Point Problem

Christopher Vahl, Ph.D.
Kansas State University-Manhattan,2005
Field:
Linear and Mixed Models, Experimental Design, Sampling

Admissions Requirements

Graduate Certificate

1. B.S. or equivalent degree from an accredited university,
2. Knowledge of College Algebra,

Master's Program in Applied Statistics

The Department of Statistics' graduate program is open to qualified graduates of universities of recognized standing. To be admitted with full status to the M.S. program, the applicant must :

1. Hold a baccalaureate degree from an educational institution of recognized standing,
2. Have had at least one year of calculus,
3. Have had at least one course in statistics,
4. Have had at least one programming language, and
5. Must have at least a 3.0 or equivalent cumulative grade point average (GPA) on all related courses at the baccalaureate level.

Joint Master's Program in Computer Science and Statistics

To be admitted with full status into the M.S. program in computer science and statistics, the applicant must satisfy the admission requirements for both the M.S. program in computer science and the M.S. program in applied statistics.

Ph.D. Program in Statistics

To be admitted with full status into the Ph.D. program, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized standing,
2. Have had four courses in math at the university calculus level or above,
3. Have had several courses in statistics,
4. Have had at least one programming language, and
5. Must have at least a 3.0 or equivalent cumulative grade point average (GPA) on all related courses at the baccalaureate level.

Students not holding a master's degree in statistics or a closely related field will not be admitted to the Ph.D. program in statistics. These students must first apply to the M.S. program in applied statistics and complete the M.S. degree.

Financial Assistance

The student must first make application to The Graduate School and be accepted in full or conditional status before he/she is eligible for an assistantship in the Department of Statistics.

Teaching assistantships are available. To be considered for an assistantship, a completed Graduate School application, official transcripts, and three letters of reference must be submitted to The Graduate School no later than March 15. International students must also submit a TOEFL score.

Degree Requirements

Graduate Certificate

Requires 12 Semester credit hours consisting of Stat 725, Stat 726, and two other pre-approved graduate level courses in statistics.

M.S. Degree in Applied Statistics

The program for the M.S. degree in applied statistics requires 32 semester credits with an overall GPA of 3.0 or higher. An oral defense of a research-based thesis or paper is required.
The program for the M.S. degree in computer science and statistics requires 42 semester credits with an overall GPA of 3.0 or higher. An oral defense of a research-based thesis or paper is required.
All students must :

1. Complete a set of core courses with a grade of B or better, including Stat 661, 662, 767, 768, 764 or 774,
2. Successfully complete 2 one-credit practicums in consulting. Each statistical practicum will be listed as Stat 794,
3. Complete an additional 9-12 hours (depends on number of research hours) of course work selected from the following courses: Stat 650, 651, 660, 663, 664, 665, 670, 730, 732, 750, 761, 762, 770, 772, 777, 778, 780, 786, 796 (Special Topics in Statistics). At

most, two of the following courses will count in the additional 9-12 hours: CSci 618, 654, 737; Math 650, 688, 728. A plan of study must be submitted.

4. Pass two written comprehensive exams. Exam 1 covers Stat 767 and 768. Exam 2 covers Stat 661, 662, and 764 or 774. Exam 1 is two hours, and Exam 2 is three hours. These exams are offered approximately the fourth week of Fall and Spring Semesters. A maximum of two attempts will be allowed, and
5. Successfully complete and defend a research-based thesis or paper.

M.S. Degree in Computer Science and Statistics

All students must :

1. Take a minimum of 42 semester credit hours, including at least 18 graduate course credits in computer science and at least 18 graduate course credits in statistics,
2. Take CSci 708, 713, 724, 737, 765, and one additional 600- or 700-level course in computer science,
3. Take Stat 661, 662, 767, 768, 764 or 774, and one additional 600- or 700-level course in statistics (does not include Stat 725 or Stat 726),
4. Pass both the comprehensive exams for the M.S. degree in computer science and the M.S. degree in statistics, and
5. Successfully complete a research-based thesis or paper. The supervisory committee must consist of at least one faculty member from computer science and at least one faculty member from statistics.

Ph.D. Degree in Statistics*

The program for the Ph.D. degree requires an additional 30 credits of course work beyond the M.S. degree and 30 hours of research. An oral defense of a dissertation is required.

All students must:

1. Complete a set of core courses with a grade of B or better, including Stat 661, 662, 767, 768, 764 or 774,
2. Successfully complete 6 one-credit practicums in Consulting/Presentation Practicum. Each statistical practicum will be listed as Stat 794,
3. Complete an additional 30 semester credits of statistics courses at the 600- or 700-level (does not include Stat 725 or Stat 726). At least 15 credits must be at the 700-level. All Ph.D. students must complete Stat 786,

4. Complete 9 semester credits from the following: Math 650, 651, 688, 689, 728; CSci 654, 737. This requirement may be waived and additional courses in statistics substituted upon approval by the adviser and advisory committee. A plan of study must be submitted,
5. Pass a written comprehensive exam. This exam consists of two sections. It is given twice a year during approximately the fifth week of each Semester. A maximum of two attempts is allowed,
6. Submit a research proposal and pass an oral exam on the proposal and related topics, and
7. Complete and successfully defend the research dissertation.

*Some of these requirements may be satisfied upon admittance into the program with an already existing M.S. degree in Statistics.

Transportation and Logistics

Program and Application Information

Program Director: Dr. Denver Tolliver

Assistant to the Director of Educational Programs: Jody Bohn

Program Location: Upper Great Plains Transportation Institute

Email: **Jody.Bohn@ndsu.edu**

Telephone Number: (701)231-7938

Degree(s) Offered: Ph.D.

Application Deadline: May 1

Test Requirements

GRE (required without M.S. degree)

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

North Dakota State University offers an interdisciplinary program leading to the Ph.D. degree in Transportation and Logistics (TL). The Transportation and Logistics program is a joint effort of the Colleges of Agriculture, Food Systems, and Natural Resources; Business Administration; Engineering and Architecture; as well as the Upper Great Plains Transportation Institute. The following departments are participating in the program: Agribusiness and Applied Economics; Civil Engineering; Construction Management and Engineering; Industrial and Manufacturing Engineering; and Management, Marketing, and Finance; and Emergency Management

The TL doctoral program allows students to develop advanced knowledge and research skills in the rapidly growing fields of transportation and logistics. The Ph.D. program consists of three main components: a core curriculum, an area of concentration,

Faculty

Magdy Abdelrahman, Ph.D.
University of Illinois-Urbana, 1996
Research Interests:
Characterization of Modified Asphalt Binders and Mixes; Pavement Maintenance and Rehabilitation Techniques; Performance-Related Specifications for Pavement Materials; Quality Control and Quality Assurance in Pavement Construction
Department: Civil Engineering

Donald A. Andersen, EngD
Texas A&M University, 1982
Research Interests:
Transportation, Pavements, Traffic Engineering
Department: Civil Engineering

Canan Bilen-Green, Ph.D.
University of Wyoming, 1998
Research Interests:
Quality and Reliability Engineering, Design and Auditing of Quality and Productivity Monitoring Systems, Statistical Modeling and Applications, Applied Operations Research
Department: Industrial and Manufacturing Engineering

John Bitzan, Ph.D.
University of Wisconsin-Milwaukee, 1997
Research Interests:
Transportation Economics
Department: Management, Marketing and Finance

and a dissertation. After completing the interdisciplinary core curriculum, students may enter one of three areas of concentration: 1) Logistics and Supply Chain Systems, 2) Transportation Economics and Regulation, and 3) Transportation Infrastructure and Capacity Planning.

Admissions Requirements

The Transportation and Logistics Ph.D. program is open to qualified graduates of universities and colleges of recognized standing. To be admitted with full standing, the applicant must

1. Hold a baccalaureate degree from an educational institution of recognized learning.
2. Have adequate preparation in one or more of the disciplines comprising Transportation and Logistics.
3. Have shown the potential to undertake advanced study and research as evidenced by prior academic performance.
4. Have earned a cumulative grade point average of at least 3.0 or equivalent in all courses completed at the baccalaureate level. Students entering from a master's degree program must have earned a cumulative grade point average of at least 3.0 or equivalent in their graduate program.
5. Have a stated interest in transportation and the capability to conduct transportation research.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show satisfactory potential for graduate study, may be admitted conditionally. The conditional status may be changed to full graduate standing after the first or second semester of study, based on the student's academic performance.

Jarret Brachman, Ph.D.
University of Delaware, 2006
Research Interests:
Al-Qaida Strategy, Counterterrorism, Transportation Security

Richard Gutkowski, Ph.D.
University of Wisconsin, Madison, 1974
Research Interests:
Structural wood systems, Bridge theory, Computational mechanics, Field testing of highway and railroad bridges, Experimental timber bridge systems, Composite wood-concrete systems, Bridge guard rail modeling and testing, Performance testing of roadway safety barriers, Composite repair of wood members
Department: Colorado State University, Department of Civil Engineering

Robert Hearne, Ph.D.
University of Minnesota, 1995
Research Interests:
Natural Resource and Environmental Economics
Department: Agribusiness and Applied Economics

Siew Hoon Lim, Ph.D.
University of Georgia, 2005
Research Interests:
Production Economics, Transportation, Industrial OrganizationDepartment: Agribusiness and Applied Economics

Jill Hough, Ph.D.
University of California-Davis, 2007
Research Interests:
Public Transportation, Travel Behavior, Built Environment, Accessibility and Mobility of Seniors
Department: Upper Great Plains Transportation Institute

A student wishing to pursue an area of concentration in Transportation Economics and Regulation must have completed intermediate-level microeconomics and taken at least one course in macroeconomics. In order to pursue an area of concentration in Logistics and Supply Chain Systems, a student must have earned a baccalaureate degree in Agribusiness, Business, Economics, Finance, Industrial Engineering, Management, Marketing, or a related field. All applicants must meet the general program prerequisites of at least one year of calculus, at least one course in statistics and economics, and an expressed interest in transportation. Preference will be given to students with prior transportation coursework and relevant research experience.

Preferably, applications for admission should be submitted directly to the Graduate School before May 1 of the upcoming academic year.

Financial Assistance

The number of assistantships varies from year to year, depending on grants and the number of students in residence. Applicants are considered on the basis of scholarship, academic performance, and financial need. The application to the Graduate School, including the three letters of reference and official transcripts, is required to be considered for an assistantship. International students must also submit a TOEFL score. Graduate tuition is waived for students with assistantships.

Degree Requirements

The Ph.D. program requires the completion of a minimum of 90 credits of graduate study beyond the baccalaureate degree with an overall GPA of 3.0 or higher. Each student must develop a

Joseph M. Jones, Ph.D.
University of Missouri, 1994
Field:
Marketing
Department: Management, Marketing, and Finance

Khaled Ksaibati, Ph.D.
Purdue University, 1990
Research Interests:
Pavement maintenance and rehabilitation, Utilization of recycled materials in highway construction,
Asset management systems, Safety of rural roads
Department: Civil Engineering

Brian Kalk, Ph.D.
North Dakota State University, 2007
Research Interests:
Energy Distribution, Urban Planning, Logistics Systems, Environmental Communications
Department: Criminal Justice and Political Science

Won Koo, Ph.D.
Iowa State University, 1974
Research Interests:
International Trade
Department: Agribusiness and Applied Economics

David K. Lambert, Ph.D.
Oregon State University, 1985
Research Interests:
Production Economics, Natural Resources
Department: Agribusiness and Applied Economics

plan of study under the guidance of a faculty adviser and a supervisory committee. Twenty-five of the graduate credit hours must consist of core Transportation and Logistics courses or suitable substitutes. A minimum of 30 credit hours must consist of research-based dissertation credits. In addition, a minimum number of credit hours must be taken in the student's area of concentration, including quantitative methods courses related to the concentration. The remaining credits may be comprised of technical electives and additional dissertation credits.

Students must pass the comprehensive/preliminary examination after the majority of the coursework has been completed. The comprehensive exam includes written and oral components related to core transportation and quantitative concepts and to the student's area of concentration. The comprehensive exam also includes a dissertation prospectus examination in which the student must present and defend a plan for undertaking and completing a dissertation. After passing of the comprehensive exam and completion of the dissertation, the doctoral candidate must pass a final examination in which the completed dissertation is presented and defended.

Brenda Lantz, Ph.D.
Pennsylvania State University, 2006
Research Interests:
Commercial vehicle safety systems and analysis, supply chain, intelligent transportation systems for commercial vehicle operations, and statistical modeling and diagnostics.
Department: Upper Great Plains Transportation Institute

Reza A. Maleki, Ph.D., PE, CMfgE
North Dakota State University, 1989
Research Interests:
Plant-wide Assessment, Manufacturing and Productivity Improvements, Rapid Product Development, Production Systems Design
Department: Industrial and Manufacturing Engineering

Peter Martin, Ph.D.
University of Nottingham, England, 1992
Research Interests:
Intelligent Transportation Systems, Traffic Signals
Department: University of Utah, Civil and Environmental Engineering

Subhro Mitra, Ph.D., P.E.
North Dakota State University, 2007
Research Interests:
Freight Travel Demand modeling, Urban Travel Demand Modeling, Asset Management and Life-Cycle Cost Study Optimizing Logistics Network, Economic Appraisal of Infrastructure Investment

Peter O'Dour, Ph.D.
University of Missouri-Rolla, 2004
Research Interests:
GIS, Groundwater contamination, Remote sensing
Department: Geosciences

Gary R. Smith, Ph.D.
Purdue University, 1986
Research Interests:
Quality Control and Systems Applications, Decision Analysis and Modeling Techniques, Safety Performance Measurement and Improvements, Labor Productivity
Department: Deans Office, Engineering and Architecture

Joseph Szmerekovsky, Ph.D.
Case Western Reserve University/Weatherhead School of Management
Research Interests:
Project management and scheduling, Complex systems and flexible manufacturing and using linear and nonlinear dynamic and integer programming and network flows
Department: Management, Marketing and Finance

Denver D. Tolliver, Ph.D.
Virginia Polytechnic University, 1989
Research Interests:
Transportation Systems Planning, Freight Transportation, Economic Analysis
Department: Upper Great Plains Transportation Institute

Rodney D. Traub, Ph.D.
Purdue University, 1994
Field: Operations Management
Department:
Management, Marketing, and Finance

Kim Vachal, Ph.D.
George Mason University, 2005
Research Interests:
Policy, Economics, Regional Development
Department: Upper Great Plains Transportation Institute

Amiy Varma, Ph.D.
Purdue University, 1993
Research Interests:
Transportation Systems and Planning, Traffic Engineering, Airports, and Infrastructure Management
Department: Civil Engineering

Nadim Wehbe, Ph.D.
University of Nevada, Reno, 1997
Research Interests:
Reinforced and Prestressed Concrete Structures, Bridge Engineering, Earthquake-Resistant Bridges, Advanced Composites
Department: South Dakota State University, Department of Civil and Environmental Engineering

David L. Wells, Ph.D.
University of Missouri-Rolla, 1996
Research Interests:
International Studies in Manufacturing Technology, Strategic Management, Economic Development Strategies
Department: Industrial and Manufacturing Engineering

William W. Wilson, Ph.D.
University of Manitoba, 1980
Research Interests:
Commodity Marketing, Agribusiness, Industrial Organization
Department: Agribusiness and Applied Economics

Frank Yazdani, Ph.D., PE
University of New Mexico, 1987
Research Interests:
Structural Engineering/Mechanics, Constitutive Modeling of Materials, Damage Mechanics, Plasticity, Computational Plasticity, Finite Elements, Concrete and Masonry Materials
Department: Civil Engineering

Jun Zhang, Ph.D.
Purdue University, 2006
Research Interests:
Supply Chain Management, Models and Methodologies of Stochastic Optimization, Lean Manufacturing and Logistics, Healthcare Engineering, Scheduling
Department: Industrial & Manufacturing Engineering

Transportation and Urban Systems

Program and Application Information

Program Director: Dr. Denver Tolliver

Assistant to the Director of Educational Programs: Jody Bohn

Program Location: Upper Great Plains Transportation Institute

Email: **Jody.Bohn@ndsu.edu**

Telephone Number: (701)231-7938

Degree(s) Offered: M.S., MTUS, Certificate

Application Deadline: May 1

Test Requirements

GRE (GMAT may be substituted)

English Proficiency Requirements

TOEFL ibT 71

IELTS 6

Program Description

North Dakota State University offers an interdisciplinary program leading to a Master of Science in Transportation and Urban Systems (M.S.), a Master of Transportation and Urban Systems (MTUS) and a Certificate in Transportation and Urban Systems. The program is a collaborative effort of four colleges and includes faculty from Agribusiness & Applied Economics; Civil Engineering; Computer Science and Operations Research; Emergency Management; Industrial Engineering; Management, Marketing & Finance; and the Upper Great Plains Transportation Institute.

Master of Science (M.S.) in Transportation & Urban Systems

This degree focuses on: (1) urban transportation systems;(2) relationships between transportation, land use, environment, emergency response, and logistical delivery systems; (3) coordinated planning, operations, and security; and (4) the spatial dimensions of urban systems.

Faculty

Magdy Abdelrahman, Ph.D.
University of Illinois-Urbana, 1996
Research Interests:
Characterization of Modified Asphalt Binders and Mixes; Pavement Maintenance and Rehabilitation Techniques; Performance-Related Specifications for Pavement Materials; Quality Control and Quality Assurance in Pavement Construction
Department: Civil Engineering

Donald A. Andersen, EngD
Texas A&M University, 1982
Research Interests:
Transportation, Pavements, Traffic Engineering
Department: Civil Engineering

Canan Bilen-Green, Ph.D.
University of Wyoming, 1998
Research Interests:
Quality and Reliability Engineering, Design and Auditing of Quality and Productivity Monitoring Systems, Statistical Modeling and Applications, Applied Operations Research

John Bitzan, Ph.D.
University of Wisconsin-Milwaukee, 1997
Research Interests:
Transportation Economics
Department: Management, Marketing and

The curriculum is built around the topics of: public transportation systems, geographic information systems, freight transportation and logistical delivery systems, urban geography and land use, the environmental impacts of transportation systems, transportation systems security, and the sustainability of transportation and urban systems. Because the M.S. degree requires a thesis, it is targeted at students with strong research interests.

Master of Transportation & Urban Systems (MTUS)

This is a non-disquisition degree that is primarily intended for professional planners and engineers. Students in the M.S. and MTUS programs can select from a common set of courses. However, students enrolled in the non-disquisition (MTUS) program have more opportunities for synthesis of practice and additional course work, with less emphasis on research.

Certificate in Transportation & Urban Systems

The certificate in Transportation & Urban Systems is primarily targeted at practicing professionals who are unable to study in residency, but who wish to gain additional knowledge in the emerging fields of transportation and urban systems. The certificate requires a minimum of 9 course credits that can be selected from a list of on-line courses, including: Transportation Systems Security, Transportation Planning and Environmental Compliance, Transportation System Modeling, Urban Transportation Systems Analysis, Context Sensitive Solutions, and Public Transportation.

Admissions Requirements

The Transportation and Urban Systems master's program is open to qualified graduates of universities and colleges of recognized standing. To be admitted with full standing, the applicant must

Jarret Brachman, Ph.D.

University of Delaware, 2006

Research Interests:

Al-Qaida Strategy, Counterterrorism, Transportation Security

Richard Gutkowski, Ph.D.

University of Wisconsin, Madison, 1974

Research Interests:

Structural wood systems, Bridge theory, Computational mechanics, Field testing of highway and railroad bridges, Experimental timber bridge systems, Composite wood-concrete systems, Bridge guard rail modeling and testing, Performance testing of roadway safety barriers, Composite repair of wood members

Department: Colorado State University, Department of Civil Engineering

Robert Hearne, Ph.D.

University of Minnesota, 1995

Research Interests:

Natural Resource and Environmental Economics

Department: Agribusiness and Applied Economics

1. Hold a baccalaureate degree from an educational institution of recognized learning.
2. Have adequate preparation in one or more of the disciplines comprising Transportation and Logistics.
3. Must have professional experience or interests in community practice.
4. Have shown the potential to undertake advanced study and research as evidenced by prior academic performance.
5. Have earned a cumulative grade point average of at least 3.0 or equivalent in all courses completed at the baccalaureate level. Students entering from a master's degree program must have earned a cumulative grade point average of at least 3.0 or equivalent in their graduate program.
6. Have a stated interest in transportation and the capability to conduct transportation research.
7. All applicants must submit a Graduate Record Examination (GRE) score at the time of the application. If a student has a recent GMAT score it may be substituted for the GRE.
8. Students who are not born in the United States or Canada must submit a TOEFL examination score.

Students who do not meet all requirements for admission or have deficiencies in prerequisite course work, but show satisfactory potential for graduate study, may be admitted conditionally. The conditional status may be changed to full graduate standing after the first or second semester of study, based on the student's academic performance.

Students will be accepted from many disciplinary backgrounds, including (but not limited to): architecture, business, civil

Siew Hoon Lim, Ph.D.
University of Georgia, 2005
Research Interests:
Production Economics, Transportation, Industrial OrganizationDepartment: Agribusiness and Applied Economics

Jill Hough, Ph.D.
University of California-Davis, 2007
Research Interests:
Public Transportation, Travel Behavior, Built Environment, Accessibility and Mobility of Seniors
Department: Upper Great Plains Transportation Institute

Joseph M. Jones, Ph.D.
University of Missouri, 1994
Field:
Marketing
Department: Management, Marketing, and Finance

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Purdue University, 1990
Research Interests:
Pavement maintenance and rehabilitation, Utilization of recycled materials in highway construction,
Asset management systems, Safety of rural roads
Department: Civil Engineering

Brian Kalk, Ph.D.
North Dakota State University, 2007
Research Interests:
Energy Distribution, Urban Planning, Logistics Systems, Environmental Communications
Department: Criminal Justice and Political Science

engineering, environmental engineering or science, geography, government, political science, sociology, and urban affairs. However, acceptance is on an individualized basis.

Preferably, applications for admission should be submitted directly to the Graduate School before May 1 of the upcoming academic year.

Financial Assistance

The number of assistantships varies from year to year, depending on grants and the number of students in residence. Applicants are considered on the basis of scholarship, academic performance, and financial need. The application to the Graduate School, including the three letters of reference and official transcripts, is required to be considered for an assistantship. International students must also submit a TOEFL score. Graduate tuition is waived for students with assistantships.

Master of Science Degree Requirements

A minimum of 30 credits is required for the degree. At least 16 of these credits must be completed using approved courses numbered from 601-689, 691, 700-789. All students must take a final examination which covers the course work taken by the candidate, as well as the thesis topic.

Each thesis will contribute new models or knowledge. The former may be achieved through the synthesis of several techniques, the modification of existing models, or new applications of analytical techniques to transportation/urban problems. The latter may be accomplished through the collection and analysis of original data or the development of innovative planning techniques. Each thesis must be of sufficient depth and quality to warrant at least 6 graduate credits. However, no more than 10 credits can be earned for any thesis.

Won Koo, Ph.D.
Iowa State University, 1974
Research Interests:
International Trade
Department: Agribusiness and Applied Economics

David K. Lambert, Ph.D.
Oregon State University, 1985
Research Interests:
Production Economics, Natural Resources
Department: Agribusiness and Applied Economics

Brenda Lantz, Ph.D.
Pennsylvania State University, 2006
Research Interests:
Commercial vehicle safety systems and analysis, supply chain, intelligent transportation systems for commercial vehicle operations, and statistical modeling and diagnostics.
Department: Upper Great Plains Transportation Institute

Reza A. Maleki, Ph.D., PE, CMfgE
North Dakota State University, 1989
Research Interests:
Plant-wide Assessment, Manufacturing and Productivity Improvements, Rapid Product Development, Production Systems Design
Department: Industrial and Manufacturing Engineering

Peter Martin, Ph.D.
University of Nottingham, England, 1992
Research Interests:
Intelligent Transportation Systems, Traffic Signals
Department: University of Utah, Civil and Environmental Engineering

Subhro Mitra, Ph.D., P.E.
North Dakota State University, 2007
Research Interests:
Freight Travel Demand modeling, Urban Travel Demand Modeling, Asset Management and Life-Cycle Cost Study Optimizing Logistics Network, Economic Appraisal of Infrastructure Investment

Peter O'Dour, Ph.D.
University of Missouri-Rolla, 2004
Research Interests:
GIS, Groundwater contamination, Remote sensing
Department: Geosciences

Gary R. Smith, Ph.D.
Purdue University, 1986
Research Interests:
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Department: Deans Office, Engineering and Architecture

Joseph Szmerekovsky, Ph.D.
Case Western Reserve University/Weatherhead School of Management
Research Interests:
Project management and scheduling, Complex systems and flexible manufacturing and using linear and nonlinear dynamic and integer programming and network flows
Department: Management, Marketing and Finance

Master of Transportation & Urban Systems Degree Requirements

The Master of Transportation & Urban Systems degree will be a non-thesis degree. However, each student must complete a creative component – which can be a case study, practicum, or paper. In the creative component, a student may develop a case study of a metropolitan region, transit system, or public program. Case studies may include: (1) comprehensive transportation planning processes in metropolitan areas, (2) urban transit systems or operations, (3) emergency or disaster response case studies or plans, (4) security programs or issues, and (5) integrated transportation/environmental plans. The case study must be approved by the student's supervisory committee, and should involve transportation and community professionals from federal, state, or local agencies, or private industries. In lieu of a case study, the supervisory committee may approve other activities or outcomes that would comprise the creative component.

A minimum of 30 credits is required for the Master of Transportation & Urban Systems degree. At least 21 of these credits must be completed using approved courses numbered from 601-689, 691, 700-789, and 791. A maximum of 4 credits will be awarded for the creative component.

Certificate Requirements

The certificate in Transportation & Urban Systems will consist of a minimum of 9 course credits selected from the list of on-line courses. At present, this list includes: TL 751 Transportation Systems Security, TL 752 Transportation Planning and Environmental Compliance, TL 753 Transportation System Modeling, TL 754 Urban Transportation Systems Analysis, TL 755 Context Sensitive Solutions, and TL 786 Public

Transportation. Additional courses may be offered on line in future years.

Program Requirements

Requirements for the degree will be met by each student formulating their plan of study utilizing the following courses as required.

Spatial Analysis Focus:

GEOG 455/655 *Introduction to Geographic Information Systems*

GEOG 456/656 *Advanced Georgraphic Information Systems*

TL 785 *Spatial Analysis in Transportation*

Transportation Planning Focus:

TL788 *Research in Transportation and Logistics*

CE 780 *Transportation Planning*

Information Systems Technologies Focus:

TL 725 *Technology Advances and Logistics*

Emergency Response and Disaster Focus:

TL 719 *Crisis Analysis and Homeland Security*

Enterprise Management Focus:

TL715 *Enterprise Resource Planning*

TL 727 *Organizational Change Management*

Electives:

TL 711 *Logistics Systems*

TL 721 *International Logistics Management*

TL723 *Advanced Supply Chain Planning*

TL 729 *Adaptive Planning in Logistics*

TL 731 *Logistics Research Methods*

TL 735 *Acquisition Contracts: Law & Management*

TL 751 *Transportation Systems Security*

TL 752 *Transportation Planning and Environmental Compliance*

TL 753 *Transportation System Modeling*

TL 754 *Urban Transportation Systems Analysis*

Denver D. Tolliver, Ph.D.
Virginia Polytechnic University, 1989
Research Interests:
Transportation Systems Planning, Freight Transportation, Economic Analysis
Department: Upper Great Plains Transportation Institute

Rodney D. Traub, Ph.D.
Purdue University, 1994
Field: Operations Management
Department:

Kim Vachal, Ph.D.
George Mason University, 2005
Research Interests:
Policy, Economics, Regional Development
Department: Upper Great Plains Transportation Institute

Amiy Varma, Ph.D.
Purdue University, 1993
Research Interests:
Transportation Systems and Planning, Traffic Engineering, Airports, and Infrastructure Management
Department: Civil Engineering

Nadim Wehbe, Ph.D.
University of Nevada, Reno, 1997
Research Interests:
Reinforced and Prestressed Concrete Structures, Bridge Engineering, Earthquake-Resistant Bridges, Advanced Composites
Department: South Dakota State University, Department of Civil and Environmental Engineering

TL 755 *Context Sensitive Solut*ions

TL756 *Transportation Systems Laboratory*

TL 786 *Public Transportation*

David L. Wells, Ph.D.
University of Missouri-Rolla, 1996
Research Interests:
International Studies in Manufacturing Technology, Strategic Management, Economic Development Strategies
Department: Industrial and Manufacturing Engineering

William W. Wilson, Ph.D.
University of Manitoba, 1980
Research Interests:
Commodity Marketing, Agribusiness, Industrial Organization
Department: Agribusiness and Applied Economics

Frank Yazdani, Ph.D., PE
University of New Mexico, 1987
Research Interests:
Structural Engineering/Mechanics, Constitutive Modeling of Materials, Damage Mechanics, Plasticity, Computational Plasticity, Finite Elements, Concrete and Masonry Materials
Department: Civil Engineering

Jun Zhang, Ph.D.
Purdue University, 2006
Research Interests:
Supply Chain Management, Models and Methodologies of Stochastic Optimization, Lean Manufacturing and Logistics, Healthcare Engineering, Scheduling
Department: Industrial & Manufacturing Engineering