

## 2011-2012 Graduate Programs

### Graduate Admissions

Baccalaureate graduates of regionally-accredited colleges are eligible to apply to the University of Delaware for admission to a graduate program. Entrance requirements are established by the departments and are subject to approval by the University Faculty Senate Committee on Graduate Studies. To be considered for admission, applicants must meet the admission requirements stipulated in the Graduate Program Policy Statement of the academic unit to which the student is applying. Admission to graduate programs at the University of Delaware is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

The University of Delaware reserves the right to refuse enrollment of any applicant. Applicants are encouraged to contact the academic department for specific admission requirements. (See the departmental sections of this catalog for more information about specific departmental admission requirements.)

Applicants for some Ph.D. degree programs may be required to complete the master's degree in the program, although the degree is not a prerequisite to admission. Students who have been admitted to a master's program and who receive their master's degree at the University are not necessarily eligible for a doctoral program. Applicants for the Ed.D. degree program are required to hold a master's degree and be currently employed either as educational administrators and supervisors or as school and community college personnel.

### Matriculation Information

Admission to the University is granted to a student to begin graduate studies in a specified semester or summer session and is valid for that term only. The offer of admission is automatically cancelled if the Office of Graduate and Professional Education is not notified of an applicant's desire to change the matriculation date. Applicants who are unable to begin graduate study in the term or semester specified may request a change by writing the Office of Graduate and Professional Education. If recommended and approved by the student's program and the Office of Graduate and

Professional Education, such an extension may be granted for a period up to one year.

Admission to graduate study does not guarantee admission to a particular course. The graduate student must meet all prerequisites as specified for each course. Courses offered at the graduate level are listed in the back of this catalog and online.

### Application Procedures and Requirements for Admission

**Application Deadline:** The University permits each department to establish their application deadline. Applicants should refer to the information given in the academic department segment of this catalog and/or check with the department to which they are applying for specific application deadlines and for other specific admission requirements. The University deadlines for application to a graduate degree program if not specified otherwise by a program is July 1 for fall semester, December 1 for spring semester, and April 1 for summer session. On-line applications are required at <http://www.udel.edu/gradoffice/applicants/>.

Applicants must submit all of the following items directly to the Office of Graduate and Professional Education before admission can be considered:

- A \$75 nonrefundable application fee must be submitted with the application. Credit card payment is accepted with the online application. Checks must be made payable to the University of Delaware. Applications received without the application fee will not be processed. Foreign students must use a check drawn on a U.S. bank or an International Postal Money Order.
- Applicants must submit essays to specific questions asked on the application; a resume; and for some programs, a personal statement. Some programs also have Supplemental Information Forms as described on the program's webpage.
- Applicants must submit at least three letters of recommendation. All letters of recommendation can be uploaded as part of the online application. If mailed, send collectively to the Office of Graduate and Professional Education. (Applicants are encouraged to seek an interview with the graduate coordinator of the program to which they are making application.)
- The Graduate Record Examination (GRE) admission test scores are required by most

departments and some departments also require subject test scores. Applicants for the Master of Business Administration or the Master of Science in Accounting program must submit Graduate Management Admission Test (GMAT) scores. Applicants should refer to the information given in the academic department segment of this catalog for specific admission test score requirements in each department. Applicants should request Education Testing Services (ETS) to report official test scores directly to the University of Delaware. The University of Delaware's institutional code for ETS is 5811. Applicants are encouraged to submit student copies of tests scores in their application packets.

- One official transcript of all U.S. colleges attended must be sent directly from the institution to the Office of Graduate and Professional Education or be provided in a sealed envelope with the application packet. Students who have attended the University of Delaware need not supply a transcript from Delaware. If the rank of the student is not displayed on the transcript or diploma, departments may request an official letter of explanation and ranking from the institution where the degree was earned.

- One official transcript of all non-U.S. based college records is required. The transcript must list all classes taken and grades earned. If the transcript does not state that the degree has been awarded, send a degree certificate that states that the degree has been awarded. If the degree has not been awarded or the degree certificate has not been issued, evidence of the awarded degree must be provided prior to the first day of classes in the term of admission. For institutions that issue documents only in English, send the English original. For institutions that issue documents both in English and a foreign language, send both the English language original and the foreign language original. For institutions that issue documents only in a foreign language, send the foreign language original and a certified translation in English. The translation must be certified by an official of the issuing institution, a state- or court-appointed translator, or the Embassy of the issuing country in the United States. If it is necessary to send non-original documents:

- The documents must be original "attested copies," officially attested to by the issuing institution or the Embassy of the issuing country in the United States; and

- Certified translations must be originals, no copies will be accepted.

- International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not the first language. The Test of English as a Foreign Language (TOEFL) is offered by the Educational Testing Service in test centers throughout the world. The University requires an official paper-based TOEFL score of at least 550, at least 213 on the computer-based TOEFL, or at least 79 on the Internet-based TOEFL for an applicant to be considered for admission. The University expects a minimum score of 18 on the Internet-based Speaking Test. TOEFL scores more than two years old cannot be validated or considered official.

International students applying for a teaching assistantship must report a paper-based TOEFL score of at least 600, at least 250 on the computer-based TOEFL, or at least 100 IBT with a speaking score of 20. TOEFL scores more than two years old cannot be validated and cannot be considered official. In addition, international students who are awarded teaching assistantships must attend a month-long training program held in late July and through the 3rd week of August at the University of Delaware's English Language Institute. Eligibility of the international student to be appointed as a teaching assistant is determined by the student's TSE/SPEAK and UDIA (University of Delaware Instructional Assessment) scores at the conclusion of this session. The UDIA, a teaching test, supplements the TSE/SPEAK by assessing overall language, cultural, questioning, and basic teaching skills as the ITA (International Teaching Assistant) teaches to a group of students in his/her subject area. Students who do not achieve the appropriate scores may find that their funding in the department is terminated. Some programs will accept the IELTS, the International English Language Testing System, that is jointly managed by the University of Cambridge ESOL Examinations, British Council and IDP: IELTS Australia. A band score of 6.5 is expected by the University.

International students must be offered admission to the University and provide evidence of adequate financial resources before a student visa will be issued. The University has been authorized under federal law to enroll nonimmigrant alien students. The University has more than 1000 international graduate students enrolled from more than 96 countries. International students are required to purchase the University-sponsored insurance plan or its

equivalent.

All first-time international students are required to attend the Orientation Day for new international students which takes place on the Friday before classes begin.

- Application procedures for senior citizens are the same as for other applicants. The admission application fee and tuition fees will be waived for senior citizen students 60 years of age and older who meet the Delaware residency requirement when admitted to a graduate program. Senior citizens who desire to enroll in graduate courses but who do not seek a degree should contact Professional and Continuing Studies or the Academy of Lifelong Learning for registration information.
- It is a Delaware State Board of Health regulation and a University of Delaware mandate that all graduate students with a birth date after January 1, 1957, be immunized for measles, mumps and rubella (MMR). Also, students may be required to provide evidence of PPD (Mantoux) Tuberculosis Screening Test within 6 months prior to beginning classes. Students who are admitted beginning January 2002 are required to show proof of vaccination against meningococcal disease unless granted a waiver. Students should refer to and complete the Student Health Service Immunization Documentation form upon admission.

### **Application Procedures for Fellowships and Assistantships**

Of the approximately 2,500 full-time graduate students, nearly 1,800 receive financial awards. Fellowships, tuition scholarships, assistantships, and internships are awarded on the basis of merit. Application for fellowship or assistantship awards is a part of the admission application form. U.S. applicants are strongly encouraged to complete a FAFSA (Free Application for Federal Student Aid) form. Applicants should apply by February 1st in most programs to be considered for financial awards. In some fields, funding from the University may be fully committed by March 15. Awarded financial aid is granted to full-time degree students with regular status who are in good academic standing. The award is valid for the term designated. Information on fellowships and assistantships may be obtained from the department to which the student is applying.

The application deadline for need-based financial assistance (FAFSA) is March 1. Refer to the "Graduate Fellowships and Assistantships" chapter in this catalog for details about the

various kinds of financial assistance available through various lending agencies.

### **Categories of Admission Status**

Applicants admitted to graduate studies at the University of Delaware will be granted admission status in one of the following categories:

#### **Regular**

Regular status is offered to students who meet all of the established entrance requirements, who have a record of high scholarship in their fields of specialization, and who have the ability, interest, and maturity necessary for successful study at the graduate level in a degree program.

Students who file an application during the final year of undergraduate or current graduate work and are unable to supply complete official transcripts showing the conferral of the degree will be admitted pending conferral of the degree if their records are otherwise satisfactory and complete. Failure to provide official documents showing degree conferral by the first day of classes will result in termination of the admission to the program until evidence of the degree is provided.

#### **Provisional**

Provisional status is offered to students who are seeking admission to a degree program but lack specific prerequisites needed in the major department. All provisional requirements must be met within the deadline given before regular status can be granted. Students admitted with provisional status to a degree program are generally not eligible for assistantships or fellowships.

Applicants who apply too late to submit standardized admission test scores may be admitted as provisional students for one semester. Termination from graduate studies following the completion of one semester will be automatic if the student has not submitted satisfactory test scores and received approval from the department for a change of status from provisional status to regular status.

#### **NonDegree Status**

Applicants who are unable to achieve regular status because of the lack of openings in a given department or applicants who wish to earn graduate credit but do not intend to work for a degree may be admitted as nondegree

## Degrees Offered

graduate students. Admission with nondegree status implies no commitment by the University or the department about later admission as a regular student. Such applicants must submit official college transcripts. Such students are not required to follow course sequences, but they are held to the same work standards as are other graduate students. This status is valid for a stated limited time. If a student desires to change from nondegree status to regular status, the student must be recommended for a change of status by the major department and seek approval by the Office of Graduate and Professional Education. Earned graduate credit may or may not be accepted if the student's classification is changed. In general, graduate credit must fit into an approved program of study and all credits must have been completed within the appropriate time limit.

Non-degree admission is also offered to students who wish to transfer graduate credits to another institution. Visiting students must submit a letter from their graduate dean or registrar certifying that they are graduate students in good standing at another institution. Such letters will be accepted in lieu of the transcripts and GRE scores which are required of all other applicants.

## Degrees Offered

### Doctor of Philosophy

The University of Delaware offers the degree of Doctor of Philosophy (Ph.D.) in animal science and food science, applied physiology, art history, biological sciences, biomechanics and movement science, chemistry and biochemistry, computer science, criminology, disaster science and management, economics, economics education, education, engineering (chemical, civil and environmental, electrical and computer, material science, and mechanical), English, energy and environment policy, entomology and wildlife ecology, geography, geology, history, human development and family studies, linguistics, marine studies, mathematics and applied mathematics, nursing science, ocean engineering, oceanography, physics, plant and soil sciences, political science and international relations, preservation studies, psychology, sociology, urban affairs and public policy, and water science and policy. In addition to the general requirements outlined in this section of the catalog, there is a section in the catalog for each instructional major which explains specific requirements for the degree in that department.

### Doctor of Physical Therapy

The degree of Doctor of Physical Therapy (DPT) is a professional degree preparing students to deliver direct patient care in an integrated process that includes examination, evaluation, planning, supervision, and performance of treatment programs.

### Doctor of Education

The degree of Doctor of Education (Ed.D.) in educational leadership is offered by the College of Education and Human Development. In addition to the general requirements outlined in this section of the catalog, there is a section in the catalog explaining the special requirements for this degree.

### Education Specialist

The degree of Education Specialist (Ed.S.) is a professional degree to be awarded to students who hold the Master of Arts degree in School Psychology and who complete the additional 30 credit hour certification requirements as an educational specialist.

### Master of Arts

The academic research degree of Master of Arts (MA) is offered in agricultural education, art history, chemistry and biochemistry, communication, criminology, American material culture, economics, economics and entrepreneurship for educators, education, English, foreign languages and literatures, foreign languages and pedagogy, geography, historic preservation, history, liberal studies, linguistics and cognitive science, political science and international relations, psychology, school psychology, sociology, teaching English as a second language, and urban affairs and public policy.

### Master of Science

The academic research degree of Master of Science (MS) is offered in accounting, agriculture and resource economics, animal science, art conservation, bioinformatics, bioinformatics and computational biology, biological sciences, biomechanics and movement science, bioresources engineering, biotechnology, chemistry and biochemistry, computer science, disaster science and management, economics, entomology, evaluation, exercise science, fashion studies, finance, food science, geography, geology, health services

administration, human development and family studies, human nutrition, information systems and technology management, marine studies, mathematics and applied mathematics, neuroscience, organizational effectiveness, development, and change, ocean engineering, operations research, physics, plant and soil sciences, public horticulture, statistics, water science and policy, and wildlife ecology.

### **Master of Applied Sciences**

The academic research degree of Master of Applied Sciences (MAS) may be earned in civil engineering.

Master of Business Administration; Master of Arts in Economics/Master of Business Administration

The professional degree of Master of Business Administration (MBA) and the combined professional degree of Master of Arts in Economics/Master of Business Administration are offered as a combined degree program by the Lerner College of Business and Economics.

Master of Business Administration; Master of Science in Accounting, Finance, Information Systems and Technology Management, or Organizational Effectiveness, Development and Change

The professional degrees of Master of Business Administration (MBA) and the combined professional degree Master of Science in Accounting, Finance, Information Systems and Technology Management, or Organizational Effectiveness, Development and Change are offered as combined degree programs by the Lerner College of Business and Economics.

Master of Chemical Engineering, Master of Civil Engineering, Master of Materials Science & Engineering, Master of Science in Mechanical Engineering, Master of Science in Electrical & Computer Engineering/Master of Business Administration.

The academic research degrees in Engineering and the professional degree of Master of Business Administration are offered as combined degree programs by the College of Engineering and the Lerner College of Business and Economics.

### **Master of Education**

The programs leading to the professional degree

of Master of Education (MEd) are designed particularly for teachers and administrators in the public schools. Majors are offered in reading, school leadership, higher education administration, exceptional children and youth, curriculum and instruction, and educational technology.

### **Master's Degrees in Engineering**

The academic research degrees of Master of Chemical Engineering (MChE), Master of Civil Engineering (ME), Master of Science in Electrical and Computer Engineering (MS), Master of Science in Mechanical Engineering (MSME), Master of Materials Science and Engineering (MMSE) are conferred under the direction of each of these departments in the College of Engineering. A non-thesis Master of Engineering: Mechanical (MEM) is available. In addition, the interdisciplinary MS is offered in Ocean Engineering.

Master of Energy and Environmental Policy

The program leading to the Master of Energy and Environmental Policy (MEEP) is designed for students who wish to study energy and environmental policy issues. The program is administered in the College of Engineering.

### **Master of Fine Arts**

The Department of Art and the Department of Theatre offer individually planned programs leading to the Master of Fine Arts (MFA). In art, a program with studio concentrations is offered to outstanding students preparing for professional careers in ceramics, printing, photography, printmaking, or sculpture. In theatre, exceptionally talented students pursue training that prepares them for a successful professional career in acting, stage management, or technical production.

### **Master of Instruction**

The Master of Instruction (MI) professional degree program is designed to help teachers improve the quality of instruction in their classrooms. Individualized programs may include studies in curriculum development and implementation, teaching strategies, assessing student achievement, and other areas related to teaching. The degree is offered in the College of Education and Human Development.

## **Graduate Fellowships and Assistantships**

### **Master of Marine Policy**

The degree of Master of Marine Policy (MMP) is a professional degree designed for individuals seeking or continuing careers in government, business, or public interest organizations that are concerned about marine policy. It is conferred under the supervision of the College of Earth, Ocean and Environment utilizing the research facilities of the Center for the Study of Marine Policy.

### **Master of Music**

The Master of Music (MM) degree program (with concentrations in composition, conducting, performance or teaching) is designed to prepare students for careers in the field of music either as performers or as music educators.

### **Master of Public Administration**

The Master of Public Administration (MPA) professional degree program is designed for persons in or seeking to enter governmental service and related occupations. It is offered by the School of Urban Affairs and Public Policy.

### **Master of Science in Nursing**

The Master of Science in Nursing (MSN) is designed to prepare clinical nurse specialists, nurse administrators, and family nurse practitioners.

### **Master of Teaching**

The Master of Teaching is intended for students who wish to become certified in teaching at the secondary level (grades 6-12) in a single subject.

### **Professional Science Master's**

The Professional Science Master's (PSM) degree is offered in Biotechnology in the Department of Biological Sciences and in Bioinformatics in the Department of Computer and Information Sciences.

## **Graduate Fellowships and Assistantships**

Of full-time graduate students, nearly 80% receive merit-based financial awards. Fellowships, tuition scholarships, assistantships, and traineeships are awarded on the basis of merit from nominations by the department. Awards are granted to full-time students in

good academic standing with regular status. Students are expected to give their full-time attention to graduate study and may not engage in any remunerative employment while holding a merit-based award that includes a stipend. Dean's permission is required for any exception to this "no other employment policy" and notice must be given to the Office of Graduate and Professional Education.

The university-wide application deadline for these merit-based awards is February 1. Applicants are encouraged to apply early and contact the major instructional department for additional application information and for deadlines earlier than February 1. The award is valid only for the term designated.

Application for fellowship, tuition scholarship, or assistantship financial aid is a part of the admission application form and is made at the time of application. Electronic application is required using the web address: <http://www.udel.edu/gradoffice/apply/> U.S. applicants are strongly encouraged to complete a FAFSA (Free Application for Federal Student Aid) form.

### **University Fellowships**

University Fellowships are awarded on the basis of nominations by the graduate departments and programs to students with regular, full-time status and high academic standing. Fellowships usually provide full tuition and a stipend. In addition, students on fellowship are eligible for coverage by the University's Accident and Sickness Insurance Plan at a reduced cost. The "policy term" is for one year at a time and students must apply for insurance coverage at the beginning of each academic year. (Coverage and student costs are subject to review each year by the insurance company and the University. A booklet, "A Guide to Student Health Services," is available from Student Health Services.) Master's students who receive fellowships and those doctoral students who have not been admitted to candidacy and who receive fellowships must be enrolled for a minimum of nine credit hours of graduate level courses per semester. Occasionally a fellowship holder may need fewer than nine credits to complete his or her program. In such cases the department must petition the Office of Graduate and Professional Education for permission to assign a fellowship to that student.

Fellows are expected to give their full-time attention to graduate study and may not engage in any remunerative employment while holding

the fellowship. Dean's permission is required for any exception to this "no other employment policy" and notice must be given to the Office of Graduate and Professional Education.

Fellowships are awarded for up to one year at a time and fellows must be in good standing which means maintaining a minimum cumulative grade point average of 3.00 (B average) each semester to continue to be eligible to hold the fellowship award. There are two categories of University fellowships: block/departmental fellowships and competitive fellowships and scholars awards.

### **Graduate Stipend Awards**

The Office of Graduate and Professional Education distributes stipend awards to graduate departments and programs for their distribution to graduate students who meet the criteria stated above. The department or program may use the stipend awards as fellowships, or teaching, research, or graduate assistantships.

### **University Graduate Fellows**

Departments and programs are invited to submit names and dossiers of their nominees to the Office of Graduate and Professional Education where a faculty review committee determines the selection of fellows. Nominees for these awards must have completed at least one year of graduate study at the University. Awards are competitive and are based on academic achievement and professional commitment and potential. Awards are granted for one year. Students may be nominated for the award in subsequent years.

### **University Graduate Scholars**

Departments and programs are invited to submit names and dossiers of their nominees to the Office of Graduate and Professional Education where a faculty review committee determines the selection of scholars. Nominations are open to both newly admitted students and graduate students currently enrolled who are U.S. citizens or permanent resident immigrants. Awards are competitive and are based on many criteria including challenging social, economic, educational, cultural or other life circumstances; academic achievements; first-generation graduate student status; and/or need as determined by federal income guidelines (FAFSA). University Graduate Scholars awards may be administered either as graduate fellowships or graduate assistantships. Awards

are granted for one year. Students may be nominated for the award in subsequent years but may receive a maximum of two years of funding in this program.

### **University Dissertation Fellows Award**

The University Dissertation Fellows award is established by the Office of the Provost to enable and support Ph.D. students to devote full attention to the completion of their doctoral dissertation. The Office of Graduate and Professional Education is responsible for the administration of this competitive award and is assisted by a faculty review committee in the selection of University Dissertation Fellows.

### **Graduate Travel Fund Award**

The Graduate Student Travel Fund is established to help University of Delaware graduate students attend and participate in professional conferences pertaining to their field of study. Conference travel plays an essential role in the academic growth and development of graduate students by providing opportunities for presentation of student work in a professional setting, as well as opportunities for networking and exposure to the latest academic research.

### **University Tuition Scholarships**

Tuition scholarships provide full-time tuition but do not pay a stipend. Tuition scholarships are awarded on the basis of nominations to students with regular, full-time status and high academic standing. Tuition scholars are required to register in a minimum of six graduate credit hours each semester. Tuition scholars may accept remuneration for employment inside or outside of the University. Tuition scholars are eligible for coverage by the University's graduate student Accident and Sickness Insurance Plan at a reduced cost. The "policy term" is for one year at a time and students must apply for insurance coverage at the beginning of each academic year. (Coverage and student costs are subject to review each year by the insurance company and the University. The booklet, "A Guide to Student Health Services," is available from Student Health Services.)

### **Graduate Student Assistantships**

The University of Delaware offers assistantships to students with regular, full-time status and high academic standing. Assistantships usually provide a stipend and tuition. Assistants are eligible for coverage by the University's graduate

student Accident and Sickness Insurance Plan at a reduced cost. The "policy term" is for one year at a time and students must apply for insurance coverage at the beginning of each academic year. (Coverage and student costs are subject to review each year by the insurance company and the University. The booklet, "A Guide to Student Health Services," is available from Student Health Services.)

Assistants must be in good standing (maintain a minimum cumulative grade point average of 3.00 each semester) to retain the assistantship. To qualify for full-time status, assistants must enroll for at least six graduate credit hours each semester or as specified on the Contractual Agreement form. Occasionally a graduate student assistant may have fewer than six credits outstanding to complete his or her program. In such a case, the department must petition the Office of Graduate and Professional Education for permission to maintain the student on an assistantship. A full-time assistant is normally appointed for twenty hours a week. Assistantships may be offered by departments for 10 hours a week with the appropriate prorated compensation (stipend and tuition). Students holding assistantships are expected to give their full-time attention to graduate study and their assigned assistantship. Any request for an exception to this policy must be sent in writing as a petition to the Dean and Office of Graduate and Professional Education. There are three categories of assistantships: teaching assistantships, research assistantships, and graduate assistantships. The definition of these categories is provided below. In cases where a student's time and funding are divided between or among these categories, the student's classification will be determined on the basis of how the student is spending the preponderance of his or her time.

### **Teaching Assistantships**

Teaching assistantships are awarded through the individual departments. Teaching assistants are required to perform teaching and other instructional activities for twenty hours each week during the academic year.

### **Research Assistantships**

Research assistantships are generally funded by research grants and contracts provided by external funding agencies. Research assistantships require twenty hours of service or research a week. Research assistants are expected to work on their assigned research

projects during winter session and may be required to conduct research during summer as well. The amount of each student's stipend will be calculated in accordance with the number of months that the student is appointed as a research assistant.

### **Graduate Assistantships**

Graduate assistantships are awarded by academic departments and other University offices to students in exchange for specialized tasks. Graduate assistants are appointed for twenty hours each week during the academic year in a variety of capacities as administrative assistants to University faculty and administrators.

### **Residence Hall Assistantships**

Students may apply for positions as hall directors in student residence halls. These assistantships are available to men and women who are full-time graduate students with regular status. Both single-hall and double-hall positions are available. Experience working in residence halls or significant leadership or supervisory experience is required.

Personal interviews with Residence Life staff are required for applicants for these positions. These interviews usually begin in early April. Students interested in residence hall assistantships should contact the Office of Residence Life, 5 Courtney Street, Newark, Delaware 19716 or call (302) 831-1201.

### **University of Delaware Press Awards**

The University of Delaware Press publishes books in many scholarly fields and disciplines. Presently its major strengths are in literary studies, art, art history, and history, including Delaware and the Eastern Shore. The Press offers internships to qualified graduate students who work with the Chair of the Board of Editors and the in-house editor, learning the day-to-day operations of a scholarly press. Interns typically work 5-10 hours a week, as the budget allows, and may also represent the Press at annual conventions and meetings of scholars and academics. Interested graduate students should contact the Chair of the Board of Editors at 200A Morris Library, telephone (302) 831-1149 for further information.

### **Industrial, Endowed, and Special Fellowships**

Funds for industrial, endowed, and special

fellowships are derived from sources outside the University. Industry, foundations, and private individuals have generously donated funds to support these special fellowships for graduate students at the University of Delaware. The stipends and supplemental allowances of these fellowships are not uniform but are based on the provisions specified by the donor. The holder of these fellowships may be required to pay tuition and fees depending on the terms of the fellowship.

### **Folger Institute Seminars And Fellowships**

As an associate member of the Folger Institute of Renaissance and Eighteenth-Century Studies, the University of Delaware offers qualified graduate students in the humanities an opportunity to enroll in seminars and workshops at the Folger Shakespeare Library in Washington, D.C. at no cost. These seminars, each limited to about twelve students from various institutions, continue for an entire semester and include such topics as "Milton and the Politics of the English Revolution," "Restoration and Eighteenth-Century Drama," "Medieval and Renaissance Origins of the Scientific Revolution," "Dante: A Reading of the Commedia," as well as studies in Shakespeare and the Elizabethans. They are offered by experts in the field from member institutions and by internationally known scholars from the United States and abroad especially invited by the Folger. Financial assistance each year is available to graduate students from Delaware to support travel to the seminars and to do research at the Library. A member of the University faculty serves on the Central Executive Committee that selects seminar members and awards the fellowships.

### **UD - Hagley Fellowships**

UD - Hagley Fellowships are offered to students enrolled in the UD - Hagley Program in the history of industrialization, broadly defined to include economic, labor and social history as well as the history of technology. Students prepare for careers either in college teaching or public history. In addition to tuition and fees, each full fellowship provides an annual stipend. All students receiving such fellowships will teach two, three, or four semesters of their stay in the program, based upon the level at which a Fellow enters the program.

### **Longwood Fellowships**

Longwood Fellowships are provided under a grant from the Longwood Foundation, Inc. for up

to a two-year period of study in the Longwood Graduate Program in public horticulture leading to the degree of Master of Science. The Fellowship may be renewed for a second year upon evidence of satisfactory progress toward the degree. In addition, the program pays tuition for four semesters and reasonable research and field trip expenses. Detailed information about the Fellowship program can be found at <http://ag.udel.edu/longwoodgrad/application.html>

### **Winterthur Fellowships**

Graduate fellowships have been established under the auspices of the Henry Francis du Pont Winterthur Museum and the University for study in the Winterthur Program in Early American Culture. All admitted students receive a fellowship which provides a full tuition scholarship, an annual stipend, and a travel allowance. Application for the program and these fellowships can only be made by applying to the program through the Director's office, 207 Mechanical Hall, Newark, Delaware 19716. In order to be considered, all application materials, including the GRE scores, must be received no later than January 15 of the year for which admission is desired. Admission is by fellowship only.

### **Delaware Nature Society Scholarships**

Scholarships are available on a competitive basis toward the University of Delaware Environmental Institution Management Course offered in winter session at the Delaware Nature Society's Ashland Nature Center. The 6-credit graduate course is open to graduate and advanced undergraduate students and postgraduate environmental science professionals. Course content includes budgeting and financial development, goal definition and long-range planning, personnel, public relations, building and grounds management, programming and teaching, and the conservation and preservation roles. For more information and scholarship applications, contact the Environmental Institution Management Coordinator, Delaware Nature Society, P.O. Box 700, Hockessin, Delaware 19707; [www.delawarenaturesociety.org](http://www.delawarenaturesociety.org)

### **Nature Education Internships**

The Delaware Nature Society offers graduate student internships. Training is offered in leadership, teaching, program design and coordination, and administration. With the approval of the major department, academic

credits may be earned. The internship may also be continued for up to one year. To apply, a resume and college transcript should be sent to the Assistant Director for Education, Delaware Nature Society, P.O. Box 700, Hockessin, Delaware 19707.

### **Other Financial Aid**

Several sources of financial aid are available to graduate students through the assistance of the Financial Aid Office. In order to be eligible for participation in the need-based programs (Federal Perkins Loans, Federal Work Study, and Federal Direct Loans), students must file a Free Application for Federal Student Aid (FAFSA). Students should begin the application procedure in January or February for the fall semester. The completed FAFSA application is sent off campus for analysis and should be mailed by February 15 so that the processed application will be returned to the University by March 15 or go to [www.fafsa.ed.gov](http://www.fafsa.ed.gov) to file online. To be eligible for federal assistance, a graduate student must be enrolled for a minimum of 5 credit hours per semester. Foreign students are not eligible for these programs.

### **Federal Perkins Loans**

Graduate students may borrow up to \$40,000. This total includes any amount previously borrowed under Federal Perkins Loans for undergraduate study. Repayment for new borrowers begins nine months after the student graduates or leaves school. Eligibility for such a loan is based on demonstrated financial need. Perkins Loans average \$1,000 per annum.

### **Federal Direct Subsidized Loans**

The Direct Loan program enables the student to borrow a low-interest loan for educational expenses. All students are required to complete a Free Application for Federal Student Aid (FAFSA) before a promissory note can be processed. A graduate or professional student may borrow up to \$8,500 per year. The interest rate for first-time borrowers is fixed at 6.8 percent. The total amount outstanding that a graduate or professional student may borrow is \$65,500, including loans previously made at the undergraduate level.

### **Federal Work-Study Program**

Eligibility is based on demonstrated financial need. Graduate students may apply if enrolled at least half-time. Jobs may be arranged either on

campus or off campus with a public or private nonprofit agency such as a hospital. If eligible, a student may be employed for as many as 15 hours a week during regular academic sessions and 40 hours per week during vacation periods. In general, the salary received is based on the current minimum wage, but it is also related to the type of work performed and the proficiency required of the student.

### **Federal Direct Unsubsidized Loan**

Graduate and professional students are eligible to borrow through the Unsubsidized Loan program. A Free Application for Federal Student Aid (FAFSA) is required. Graduate students are entitled to borrow \$12,000 per year in addition to the amounts that they may borrow under the Federal Direct Subsidized Loan Program. The total amount that a student may borrow through the subsidized and unsubsidized programs is \$138,500. This includes loans received during undergraduate study. The interest rate is fixed at 6.8 percent. Aid that is received through one's department, such as a graduate assistantship, can affect one's total loan eligibility.

### **Federal Direct PLUS Loans**

Graduate and professional students may borrow on their own behalf, up to the cost of attendance. The interest rate for PLUS loans is fixed at 8.5 percent. It is necessary to file the FAFSA to apply for the PLUS loan.

### **Emergency Loans**

Undergraduate and graduate students may have difficulty with temporary, unanticipated expenses. The Office of Scholarships and Financial Aid offers a 30-day, no-interest loan to assist with such temporary difficulties. Contact the Office of Scholarships and Financial Aid for further information regarding emergency loans.

### **Financial Aid Recipient Withdrawals**

If you are a recipient of Title IV federal financial aid funds (Examples: Direct/Stafford Student Loans, Perkins Loan, Nursing Student Loan is also a federal financial aid program, Direct/Parent Loan) and your enrollment terminates through official withdrawal, your financial aid award must be reviewed for possible adjustment.

Financial aid eligibility is based on the cost of education (tuition, mandatory fees, housing, meal plan, books, etc.) incurred for the entire

## Academic Regulations for Graduate Students

semester and is contingent upon completion of that semester. When you withdraw, federal regulations mandate that any unearned aid be returned to the federal aid programs. The percent of aid earned is based on the date of withdrawal divided by the total number of days in the semester. Title IV recipients are governed by federal policy if they withdraw prior to completing 60% of the semester.

If your institutional charges are reduced or recalculated, this change may result in the reduction of recipients' other sources of financial aid.

### Failure to Withdraw Officially

Students are required to adhere to the University's official withdrawal policy when terminating their enrollment prior to the end of a given term. Failure to officially withdraw will result in the cancellation of any Federal financial aid program funds previously awarded for that term. Federal regulations require that funds for ineligible recipients be returned to the financial aid program accounts. Students will be billed for semester charges.

### Satisfactory Academic Progress

For financial aid purposes, the federal Title IV assistance programs require students to maintain progress toward a degree. The federal programs include Federal Work-Study, Federal Direct Loans, Federal Family Education Loans (Stafford), and Federal Perkins Loans. Satisfactory progress for financial aid purposes requires:

1. Completion of a graduate degree within five years of full-time attendance or its equivalent (a seven-year limit is provided for doctoral students entering without a master's degree),
2. A cumulative grade point average consistent with the requirements of the graduate division, and
3. Successful completion of 67% of credit hours attempted.

Academic records will be reviewed at the end of each spring semester. Students who fail to make satisfactory progress will be ineligible for federal financial assistance. Additional information concerning this policy may be obtained from the Office of Scholarships and Financial Aid.

### Campus and Other Employment

Information on summer and part-time jobs both

on campus and in the surrounding community is available in the Career Services Center through the Student Employment Service or on-line (<http://www.udel.edu/CSC>). Jobs that are federally funded through the College Work-Study Program are listed in the Office of Scholarships and Financial Aid at (302) 831-8761.

## Academic Regulations for Graduate Students

### BASIC RESPONSIBILITIES

Introduction: Although the University provides information, assistance, advisement, and counseling to students through the publications of numerous departments and offices, the ultimate responsibility for complying with the requirements for the degree and with the regulations of the University rests with the student. Students should read the catalog, the Departmental Program Policy Statement and other information provided by the department and the University. If students have questions about a requirement or regulation, they should seek the answer through the instructional department or the Office of Graduate and Professional Education. Students should not wait for some authority within the University to inform them that they have not fulfilled a requirement or complied with a regulation.

The University of Delaware extends to qualified graduate students the privilege of attendance. The expectation is that they will put forth a genuine effort academically. Their conduct and citizenship at all times both on and off campus must reflect credit upon the University and its student body. Students may be suspended or terminated for academic or disciplinary reasons if officers of the University determine that they are not profiting by attendance or that such action is not in the best interests of the University. Graduate students are required to abide by the Code of Conduct as published in the Student Guide to University Policies available online at [www.udel.edu/stuguide/current](http://www.udel.edu/stuguide/current). Graduate students accused of a violation of the Code of Conduct are subject to a hearing procedure and disciplinary action under the Graduate Student Judicial System.

It is the policy of the University of Delaware that no person shall be subjected to discrimination on the basis of race, color, gender, sexual orientation, age, religion, ancestry, national origin, disability, or veteran status.

## **Academic Honesty**

Academic honesty and integrity lie at the heart of the educational enterprise. Students are expected to do their own work and neither to give nor to receive assistance during quizzes, examinations, or other class exercises. One form of academic dishonesty is plagiarism. Students are urged to consult individual faculty members for explanation of procedures for taking tests, writing papers, and completing other course requirements so that students may fully understand their instructor's expectations. Because faculty and students take academic honesty seriously, penalties for violations may be severe, depending upon the offense as viewed by the Graduate Student Judicial System. The minimum sanction for cases of proven cheating is an automatic failure for the course and/or expulsion from graduate studies at the University.

## **Responsible Computing**

Use of the University's extensive computing resources for course assignments, research projects, email, and access to information resources available on the Internet is a privilege. Students must abide by the policies and procedures governing use of these resources. Under the Policy for Responsible Computing ([www.udel.edu/ExecVP/polprod/1-14.html](http://www.udel.edu/ExecVP/polprod/1-14.html)), all students must assume responsibility for the integrity of these resources, respect the rights of other users, and abide by all relevant laws and contractual obligations.

To educate students about secure and appropriate computer use, the University has initiated a number of campaigns including the following:

- "The Code of the Web" conveys the importance of the many issues related to responsible computing ([www.udel.edu/codeoftheweb/](http://www.udel.edu/codeoftheweb/));
- "No Excuses" educates students about the legal implications of downloading and sharing materials that hold copyright protection ([www.udel.edu/legaltunes/](http://www.udel.edu/legaltunes/)); and
- "Protecting Personal Non-public Information (PNPI)" encourages strategies that students should use to protect their personal information as well as activities that help protect against identity theft ([www.udel.edu/pnpi](http://www.udel.edu/pnpi)).

Students alleged to violate the Policy for Responsible Computing ([www.udel.edu/ExecVP/](http://www.udel.edu/ExecVP/)

[polprod/1-14.html](http://www.udel.edu/ExecVP/polprod/1-14.html)) are subject to full disciplinary action within the Student Judicial System, up to and including loss of computing privileges, suspension, or expulsion. Questions about responsible computing may be directed to the IT Help Center at (302) 831-6000.

In addition, the owner of a computer that is identified as sharing copyrighted material risks prosecution for violation of copyright laws. File sharing of copyrighted material is illegal. A student who is identified as violating copyright laws will, among other penalties, have his or her network connection terminated for at least 30 days, and the case will be referred to the Office of Judicial Affairs. For more information about copyright abuse, see ([www.udel.edu/security/copyright\\_abuse.htm](http://www.udel.edu/security/copyright_abuse.htm)).

## **Anti-virus Software**

If a computer is not running up-to-date anti-virus software, it can become infected with computer viruses. These viruses threaten the security of the campus network. UD has a site license for McAfee anti-virus software, which can be obtained free ([udeploy.udel.edu](http://udeploy.udel.edu)). McAfee software must be installed on any computer that connects to the campus network. This version of McAfee is automatically updated when a computer is connected to the network, providing continued protection from future virus infection. Students should also be checking for and deleting spyware at least once a week. See ([www.udel.edu/security](http://www.udel.edu/security)) for more information about how to protect your computer from viruses and spyware.

## **Computer Clean-up Policy**

A student who brings a compromised computer to Information Technologies-User Services (IT-US) to be cleaned of viruses, adware, spyware, peer-to-peer (P2P) software, and other software that pose risks to the campus network will be charged \$70 for the first cleaning and \$100 for subsequent cleanings. The fee will be charged to the student's account and will appear on the student's bill. The fees collected for the computer clean-up service will go towards expanding the University's educational efforts and resources to help make students aware of their responsibilities to keep their computers and the campus network running securely.

# Family Educational Rights And Privacy Act, Attendance, Registration, & Enrollment

## Family Educational Rights And Privacy Act, Attendance, Registration, & Enrollment

### Attendance Regulations

Students are expected to attend all their scheduled classes and laboratories and not to be absent without adequate reason. See University Attendance Policies.

Deficiency in any required work resulting from absence from class must be made up to the satisfaction of the instructor.

A student who is absent from a course without adequate reason may be assigned a failing grade. Students who are registered as Auditors are subject to the same attendance regulations as those registered for credit. Those Auditors who are reported for their excessive absence from class will receive a grade of LW in the course.

By action of the University Faculty Senate, the responsibility for defining attendance expectations is left to the individual faculty member, subject to the guidelines given below. Thus, it is of great importance that early in each course the instructor make clear to each student what the attendance expectations are, and how absences due to "relatively minor" illnesses, as described below, are to be communicated. Students should check the syllabus for attendance expectations and means of communicating about minor illnesses.

It is the policy of the University of Delaware not to cancel classes on religious holidays. However, students and faculty are encouraged to exercise their own judgment pertaining to their attendance on these days. In addition, faculty are encouraged not to schedule examinations or require the submission of special assignments on the following days: the evenings before as well as the first two days of Rosh Hashanah and Yom Kippur in the fall term, Good Friday and the evening before and the first two days of Passover in the spring semester.

- Absence on religious holidays listed in University calendars is recognized as an excused absence. Nevertheless, students are urged to remind the instructor of their intention to be absent on a particular upcoming holiday.

- Absences on religious holidays not listed in University calendars, as well as absences due

to athletic participation or other extracurricular activities in which students are official representatives of the University, shall be recognized as excused absences when the student informs the instructor in writing during the first two weeks of the semester of these planned absences for the semester. Absences due to similar events that could not have been anticipated earlier in the semester will be recognized as excused absences upon advanced notification of the instructor by an appropriate faculty advisor or athletic coach.

- Absences due to serious illness or death within a student's family are recognized as excused absences. To validate such absences, the student should present evidence to the Assistant Dean's Office of his or her college. Documentation must be provided in English. The Assistant Dean's Office will then provide a letter of verification to all of the student's instructors for the term.

- Absences due to serious illness of the student (e.g., hospitalization, surgery, or protracted medical illness or convalescence) shall also be recognized as excused absences. To validate such absences, the student should present evidence of the illness to the Assistant Dean's Office of his or her college. Documentation must be provided in English. Supportive evidence will be provided on the student's request by the Student Health Service directly to the respective Assistant Dean.

- For relatively minor, short-term illnesses of students (e.g., colds and flu, where attendance in class is undesirable), or their immediate family, the University system depends upon reasonable communication between students and faculty. If possible, students should report such illnesses before the affected class, following the directions of the instructor as provided at the beginning of the semester.

- Absence due to short-term military duty in the National Guard or active reserve is recognized as an excused absence. To validate such an absence, the student should present evidence to the Assistant Dean's Office of his or her college. The Assistant Dean's Office will then provide a letter of verification to all of the student's instructors for the term.

- Students are not to be penalized if absent from an examination, lecture, laboratory, or other activity because of an excused absence. However, students are fully responsible for all material presented during their absence, and faculty are encouraged to provide opportunities, when feasible, for students to make up

examinations and other work missed because of an excused absence.

## **Registration Requirements**

### **Advance Registration**

All matriculated students should register in advance for spring and fall semesters and winter and summer sessions. Registration periods are scheduled for returning full-and part-time graduate students in late April for fall semester and in late November for spring semester. Advance registration periods also precede the summer and winter session. Newly admitted or returning graduate students should register during the appropriate time. Contact the Registrar's Office or the Office of Graduate and Professional Education for information on advance registration. For newly admitted students unable to advance register for fall semester, special permission may be sought from the Office of Graduate and Professional Education to waive the late registration fee.

### **Continuous Registration**

Graduate students are required to maintain continuous registration each fall and spring semester to be eligible to continue in a degree program. Failure to comply with the requirement of maintaining continuous registration in the fall and spring semesters either in courses, in sustaining credit, or with approved leave of absence will be taken as evidence that the student has terminated his/her graduate program, and the admitted status to the graduate program will be terminated. The date of termination will be recorded on the student's transcript.

### **Policy Regarding Incompletes**

A student who has incompletes in three or more courses may not register in the next regular semester (i.e., fall or spring) for additional courses without the approval of the Assistant Provost for Graduate Studies.

### **Full-Time And Part-Time Status**

Students enrolled in at least 9 credit hours or in sustaining credit are considered full-time students. Those enrolled for fewer than 9 credit hours are considered part-time students, although students holding assistantships are considered full-time with six credits. Generally, a maximum load is 12 graduate credit hours; however, additional credit hours may be taken

with the approval of the student's adviser and the Office of Graduate and Professional Education. A maximum course load in either summer or winter session is 7 credit hours. Permission must be obtained from the Office of Graduate and Professional Education to carry an overload in any session.

Students who are permitted by special arrangement to conduct a portion of the research for their thesis in governmental or other laboratories off campus must register for this work so that it may count toward degree requirements. This work must be under the direct supervision of a member of the faculty of the University. The amount of credit earned is determined and approved by the student's advisory committee.

### **Course Load Requirements For Full-Time Students Holding An Assistantship or Fellowship**

A student must be classified as full-time to be eligible to hold an assistantship or fellowship. Students holding a teaching assistantship, a research assistantship, a graduate assistantship, or a tuition scholarship must register for at least 6 credit hours of graduate-level courses each fall and spring semester to meet full-time status. (Note: Some programs may require students to be registered in more than six credits.) Students holding a fellowship must register for at least 9 credit hours of graduate-level courses each fall and spring semester to meet full-time status. These graduate-level courses must be taken for credit and must be maintained throughout the semester. Listener or undergraduate-level courses may be taken in addition to the minimum of 6 or 9 hours of graduate-level courses in each semester that the student is on contract. Students on contract in fall or spring semester who are completing a thesis or a dissertation and who have not submitted it to the Office of Graduate and Professional Education may register in sustaining credit to meet full-time status.

### **Summer Registration**

Students who are supported by the University as research assistants during the summer months are required to be registered in at least three credits during the 7 1/2 week summer session under the following guidelines: the work must be related to the student's degree program, and the funding amount must meet the minimum requirement per month in June and July. Students may register in 868-800 (research), 869 (thesis), 964 (pre-candidacy study), 969

(dissertation), 864 (internship), sustaining, or a regular graduate course needed for the degree and offered in the 7 1/2 week summer session. Except for 864, 869, or regular courses, all courses are graded pass/fail.

#### Sustaining Credit For Candidates Completing Thesis/Dissertation/Executive Position Paper

Once a graduate student who is completing a thesis, dissertation, or executive position paper has completed all required course credits needed for the degree (including six credits of Master's thesis [869] or nine to twelve credits of dissertation [969]) and all other degree requirements except the submission of the thesis, dissertation, or executive position paper, the student must maintain matriculation in the degree program during the fall and spring semesters by registering for either Master's Sustaining: Thesis (UNIV 899) or Doctoral Sustaining (UNIV 999). All students, including sustaining students, must be registered in the semester in which the degree is officially awarded. Sustaining registration is required for summer and winter session only if the degree is awarded at the conclusion of the summer or winter session. Students in sustaining status are considered full-time.

#### Sustaining Credit For Master's Candidates Pursuing Non-Thesis Degree Option

Once a master's student pursuing a non-thesis option has registered for all required course credits needed for the degree, but has not completed other non-thesis degree option requirements such as a portfolio, research option paper, comprehensive examination, art show or exhibit, or incomplete grades, the student is required to maintain his/her eligibility for the degree program during the fall and spring semesters by registering for Master's Sustaining: Non-thesis (UNIV 895). All students, including sustaining students, must be registered in the semester in which the degree is officially awarded. Sustaining registration is required for summer and winter session only if the degree is awarded at the conclusion of the summer or winter session. Students in sustaining status are considered full-time.

#### Changes In Registration

Authorization for changes in registration after the University's published deadlines must be requested in writing from the student's adviser and must be reviewed and approved by the Office of Graduate and Professional Education.

Forms for registration changes are provided by the Registrar's Office, or students may use UDPHONE or UDSIS Personal Access.

**Registration cancellation.** Students who decide not to attend any of the registered courses before the end of the first two weeks of classes must complete withdrawal procedures using UDPHONE, online change of registration, or a paper drop-add form. The approval of the Office of Graduate and Professional Education is not needed, but the student is required to give notice in writing to the department and the Office of Graduate and Professional Education. If the notification is received before the end of the first two weeks of classes, the registration is cancelled.

**Drop-Add procedures.** Students who advance register and wish to change their registration by either dropping courses or adding others may do so within the free drop-add period during the first two weeks of classes using UDPHONE, online change of registration, or a paper drop-add form. After that period and until the end of the first six weeks of classes, a fee of \$20 is charged for each drop-add form processed. Approval of the Office of Graduate and Professional Education must be sought for all changes after the free drop-add period.

**Withdrawal after the free drop-add period.** If the notification of the intention to withdraw from all registered courses is made after the free drop-add deadline, the student must request in writing permission to be withdrawn by the Office of Graduate and Professional Education. A tuition rebate is made only for course withdrawals made before the end of late registration in the fall and spring semesters and before the end of the first week of classes in either summer session. If a student withdraws unofficially, registration is continued until the end of the term and the student receives failing (Z) grades in all courses. Rights to any rebates to which the student might have otherwise been entitled are also forfeited.

#### Leave Of Absence

Students enrolled in a degree program who seek a leave of absence from the program for personal, medical, or professional reasons must first obtain written approval from the chair or graduate program coordinator of their academic unit. The request and the recommendation from the department should be sent to the Office of Graduate and Professional Education for approval. The length of time needed for

the leave should be indicated. The Office of Graduate and Professional Education will send written notification of the approval or denial of the requested leave. Upon approval of the Office of Graduate and Professional Education, the student's academic transcript will record the approved leave in the appropriate semesters. The period of absence will not affect the limitation of time for completion of the degree requirements as given in the student's official letter of admission. .

### Resignation From The University

A graduate student wishing to resign from the University (i.e., terminate his/her association with the University and a specific degree program) may do so by submitting a letter to the Office of Graduate and Professional Education indicating the reasons for the resignation. The Office of Graduate and Professional Education will cancel the student's matriculation and indicate the effective date of the resignation on the student's transcript.

## **COURSES AND CREDITS**

### Graduate Course Numbering System

Graduate credit may be earned for courses numbered 600 to 699, 800 to 898, and 900 to 998. Courses numbered 600 to 699 are graduate-level courses open to qualified, advanced undergraduates by permission of the instructor. Courses numbered 500 to 599 are graduate courses for the nonspecialist and may not be counted for graduate credit in the student's major. With the approval of the student's major department, 500-level courses taken outside the student's major department may be applied toward a graduate degree.

### Transfer Of Credits

#### Credit Earned As A Continuing Education Student At The University Of Delaware

Students who complete graduate credits with the classification of CEND (Continuing Education Nondegree) at the University of Delaware may use a maximum of 9 graduate credits earned with this classification toward their graduate degree. The CEND credits, grades, and quality points become a part of the student's academic record and grade point average. CEND credit can be transferred provided that: (a) the course was at the 600-800 level, (b) the course was taken within the time limit appropriate for the degree, (c) the course was approved by the student's advisor and the chair of the student's major

department, and (d) the course was in accord with the specific degree program as specified by the unit's Graduate Program Policy Statement. Courses at the 500-level offered by the department in which the student has declared a major shall not be accepted for transfer.

### Transfer Of Credit From Another Institution

Graduate credit earned at another institution will be evaluated at the written request of the student. Such a request should be directed to the student's major department using a Request for Transfer of Graduate Credit form. A maximum of 9 credits required for the degree will be accepted provided that such credits:

- were earned with a grade of no less than B-,
- are approved by the student's adviser and the chair of the student's major department,
- are in accord with the specific degree program of the student
- as specified by the unit's Graduate Program Policy Statement,
- are not older than five years, and
- were completed at an accredited college or university.

The credits, but not the grades or quality points, are transferable to University of Delaware graduate records. Graduate courses counted toward a degree received elsewhere may not be used. Credits earned at another institution while the student was classified as a continuing education student at that institution are not eligible to be transferred to one's graduate degree at the University of Delaware. Credits from institutions outside of the United States are generally not transferable to the University of Delaware.

### Transfer Of Credit From The Undergraduate Division At The University Of Delaware

Students who wish to transfer credits from their undergraduate record to their graduate record may transfer a limited number by arranging with the department to have these courses approved by their instructors before the courses are taken. These courses must be at the 600 level, and the student must perform at the graduate level. They must be in excess of the total required for the baccalaureate degree, must have grades of no less than B-, and must not be older than five

## GRADES AND ACADEMIC STANDING

years. The credits, grades, and quality points will transfer.

### Credit By Examination

Students enrolled in graduate studies may receive credit by examination for graduate-level courses at the discretion of the appropriate department, division, or college. A student permitted to take such examinations must receive a grade of no less than B-.

### Credit For 400-Level Special Problem Course

Some 400-level courses may be completed for graduate credit if the graduate student does additional work. Students must register for the course at the graduate level using the departmental number of 666. For example, a graduate student who attends PSYC 425 and fulfills additional graduate level requirements to earn graduate credit should register for PSYC 666, not PSYC 425. The student may process a titling form for the 666 numbered course.

### Expiration Of Credit

Graduate course credits expire five years after the course has been completed.

## GRADES AND ACADEMIC STANDING

### University Grading Policy

#### Final Grades

The following quality point scale is used in the University of Delaware grading system:

NOTE: In courses requiring a minimum letter grade (for example, a C or better), the minus grade (for example C-), fulfills the requirement. Similarly, when a B or better is required, a B- fulfills the requirement. However, the quality points per credit for a B- are fewer than for a B (see chart below), and the University requires that graduate students achieve an overall cumulative grade point index of at least 3.0 for graduation.

A	Excellent 4.00 quality points per credit
A-	3.67 quality points per credit
B+	3.33 quality points per credit
B	Good 3.00 quality points per credit
B-	2.67 quality points per credit
C+	2.33 quality points per credit
C	Fair 2.00 quality points per credit
C-	1.67 quality points per credit
D+	1.33 quality points per credit
D	Poor 1.00 quality points per credit

D-	0.67 quality points per credit
F	Failure 0.00 quality points per credit
X	Failure, 0.00 quality points per credit (Academic Dishonesty)
Z	Failure, 0.00 quality points per credit (Unofficial Withdrawal)
L	Listener - Registration without credit or grade. Class attendance is required, but class participation is not.
LW	Listener Withdrawn - A listener who does not attend sufficient class meetings to be eligible, in the judgment of the instructor, for the grade of L will receive the grade
LW.	
NR	No grade required.
P	Passing - For specifically authorized courses, such as 969. P grades are not calculated in index.
W	Official Withdrawal - Passing at time of withdrawal.
**WF	Official Withdrawal - Failing at time of withdrawal.
**	Students permitted to withdraw after the announced deadlines for whom the grade of WF has been reported will receive a grade of F for the course unless the Office of Graduate and Professional Education approves their withdrawal "without penalty."

### Temporary Grades

No student will be permitted to graduate from the University with temporary grades pending. Students intending to receive a master's degree who have been given permission to continue studies toward a doctoral degree may retain those temporary grades that do not apply to the master's course of study. If a student does not take steps to remove temporary grades, these grades will be changed to F at the expiration of the regular degree program time limits.

The following temporary grades are used:

I - Incomplete. Used to indicate incomplete assignments, absences from final or other examinations, or any other course work not completed by the end of the semester.

An I grade must be removed no later than the end of the first six weeks of the semester immediately following, e.g., incomplete work for the fall semester must be completed by the end of the first six weeks of the spring semester following; incomplete work for the spring semester must be completed by the end of the first six weeks of the following fall semester.

## **Academic Standing, Probation, Dismissal**

Incomplete work for either summer session must be completed by the end of the first six weeks of the following fall semester. Under extenuating circumstances, the Office of Graduate and Professional Education may approve extensions to these time limits if requested to do so in writing by the instructor.

At the time of grading, the instructor who gives an I grade will be required to report to the department chair and the Graduate Studies Office by the I Grade Explanation Form: (1) the nature of the incomplete (absence from the final examination, project or paper not completed, etc.), (2) the student's reason for the incomplete (illness, accident or injury, serious illness or death in immediate family, etc.), and (3) the grade earned by the student in the course exclusive of the incomplete work. Copies of the I Grade Explanation Form will be sent to the department chair and the Graduate Studies Office for file and audit.

Instructors should submit a change of grade to the Graduate Studies Office in order to change the temporary grade of I to a permanent grade by the deadline for completing incomplete work. If the incomplete work has been made up, the instructor will give the appropriate final grade for the course. If the work has not been made up, the instructor may give the student a final grade of F, or may have the option of giving the student a passing grade based on the work that was completed for the course. If the instructor has not reported a final grade upon the expiration of either the deadline or the extension of the deadline, the temporary grade of I will revert to a grade of F.

**S - Satisfactory Progress.** For thesis research, dissertation, independent study, special problems, distance learning and other courses which span two semesters or in which assignments extend beyond the grading deadline in a given semester.

**U - Unsatisfactory Progress.** For thesis research, dissertation, independent study, special problems, distance learning and other courses which span two semesters or in which assignments extend beyond the grading deadline in a given semester.

Temporary grades of S and U are recorded where the work normally extends beyond the regular semester periods. The time limit for such grades is determined by the nature of the project. Final grades are normally recorded at the completion of the project. The grade recorded for

the last course entry (a final grade) is understood to be the grade that applies to all preceding S or U grades in that course. If instructors wish to change individual S or U grades, they may do so in the regular manner through change-of-grade forms. The revised current and cumulative summaries will be posted on the permanent record at the time of and along with the recording of grade changes.

N - No grade reported by instructor.

## **Academic Standing, Probation, Dismissal**

### **Academic Good Standing**

To be considered in good academic standing, a student must maintain a minimum cumulative graduate grade point average (GPA) of 3.00 on a 4.00 scale each semester. To be eligible for an advanced degree, a student's cumulative grade point average shall be at least a 3.00 and the student's grades in courses counted toward the degree requirements of the program shall equal at least a 3.00. A grade below a C- will not be counted toward the course requirements for a degree but is calculated in the student's cumulative grade point average.

In addition to the University's definition of good standing, some programs may also require minimum grades in specific courses in the program. These courses are identified in each program's policy and procedures manual and these unit-specific requirements have been approved by the Faculty Senate.

Performance in graduate lecture courses and seminars is evaluated according to the University's Grading Policy. When the work required in research (868/968), dissertation (969), master's thesis (869), or special problem (866) extends beyond the regular semester period, temporary grades of "S" and "U" should be recorded. Final letter grades are to be recorded only at the completion of the project.

### **Academic Deficiency And Probation**

The Office of Graduate and Professional Education monitors the academic progress of all graduate students and notifies students in writing of all academic deficiencies. The cumulative GPA after each 9-hour increment determines academic standing. (See chart below.)

If a student is on/And earns a cumulative GPA of/  
The status will become:

Any status (or clear)	3.0 or above	Clear
Clear	2.99-2.5	Warning
Clear	2.49-2.0	Probation
Probation	Below 3.0	Dismissal
Warning	Below 3.0	Probation
Any status	Below 2.0	Dismissal

In addition to the University policy regarding minimum grade point averages, some departments require graduate students to maintain certain performance minima in their programs of study in all or in particular courses. Failure to meet the stated minima may lead to academic dismissal from the program.

### **Graduate Studies Academic Probation Policy**

The University's Academic Probation Policy is expressed in the following chart:

The Office of Graduate and Professional Education notifies students when they are dismissed from graduate programs without completing a degree. Dismissals usually take place at the end of a term. Students may be dismissed for the following reasons:

- Upon the expiration of the five-year time limit for master's degree programs or for those students in a doctoral program who were admitted with a master's degree. Upon the expiration of the seven-year time limit for doctoral students who were admitted without a master's degree.
- Upon the failure to meet the grade point average requirements as stated in the policy on Academic Deficiency and Probation.
- Upon written notice to the Office of Graduate and Professional Education of voluntary withdrawal from the program.
- Upon failure to pass the preliminary, language, or comprehensive/candidacy examination(s), a thesis/dissertation/executive position paper proposal defense, or a thesis/dissertation/executive position paper defense.
- Upon the failure to achieve a cumulative grade point average of 3.0 upon the completion of the stated number of required credits for a degree.
- Upon the failure to meet the stated minima in specific course requirements as identified by individual programs when a department has a

policy that such failure leads to dismissal from the program.

- Upon failure to satisfactorily conduct research required for the degree.
- Upon the determination by the faculty of the student's department that the student has failed to meet or has failed to make satisfactory progress towards meeting academic standards required of the student's program other than the failure to achieve a cumulative grade point average of 3.0 upon the completion of the stated number of required credits for a degree.

At the close of each semester, winter session or summer session, in those circumstances deemed appropriate by the department or program faculty exercising its professional judgment, the faculty of each department or program may evaluate the progress of a graduate student toward meeting the academic standards of the program in which the student is enrolled. In addition to graded course work, academic standards include, but are not limited to, professional, ethical, clinical and other standards required of graduate students.

Students are entitled to know the procedures and standards by which their academic performance is assessed. Each program has a statement of policies and procedures by which student academic progress is monitored and by which comprehensive, qualifying, and final examinations/defenses are conducted and graded. If, in the professional judgment of a department or program faculty, a student has failed to make satisfactory progress toward meeting the academic standards of the program in which that student is enrolled, the faculty may vote to dismiss that student from the program.

In the case of dismissal, the program director is required to send a report to the Office of Graduate and Professional Education that states the faculty vote on the decision causing dismissal and the justification for this action. The Office of Graduate and Professional Education will notify a student in writing when the student is being dismissed for failure to make satisfactory progress in the program.

In the case of academic dismissal, the student may appeal the termination by writing to the Office of Graduate and Professional Education. This appeal must be made within ten class days from the date on which the student has been notified of academic dismissal. The Vice Provost will review the appeal and may either uphold the

## PROGRAM CHANGES

dismissal, grant reinstatement or refer the case to the Graduate Hearing Board for resolution.

If the Vice Provost grants reinstatement, the student must meet the conditions of the reinstatement. Failure to meet these conditions will result in dismissal from the program.

A graduate student may be reinstated only once to a given major. The student's academic transcript will reflect the reinstatement with the appropriate academic probation status.

### Re-Enrollment Following Academic Dismissal

A graduate student who has been dismissed from the University for academic deficiency may not be readmitted to the major from which the student was dismissed. This policy does not apply to a student who is dismissed for exceeding the time limit for the completion of the degree and is granted reinstatement to the original major for an extension of time.

A student who is dismissed may be admitted as a matriculated graduate student in a different major. The student must apply and be approved through regular admission procedures. A graduate student may be readmitted only one time to a different major after academic dismissal. All information related to the dismissal is available to the new program admissions committee.

The student's grade point average at the time of dismissal shall not carry over to the new major. The student's academic grade point average shall be based on grades received following admission to a new program. Similarly, credit for courses completed while matriculated in the major from which a student is dismissed may not be used to fulfill requirements of a different graduate program.

### Reapplication After Graduation Or Withdrawal

Students who have officially withdrawn from a graduate program at the University or students who have completed a terminal degree program and subsequently seek to reenter the University for further graduate study must apply for admission and follow the same procedures as any other student seeking admission to graduate study. Students continuing in a doctoral program immediately after completing the master's degree in the same major may request this change of program on a Change of Classification Form.

## Honor Societies

Honor societies at the University of interest to graduate students include Phi Beta Kappa (scholarship in liberal arts), Phi Kappa Phi (scholarship, without regard to area of study), Alpha Zeta (agriculture), Omicron Delta Epsilon (economics), Kappa Delta Pi (education), Tau Beta Pi (engineering), Pi Mu Epsilon (mathematics), Sigma Theta Tau (nursing), Sigma Pi Sigma (physics), Psi Chi (psychology), and Sigma Xi (scientific research).

## PROGRAM CHANGES

### Changing Majors

If a graduate student desires to change majors which are not housed in the same department, the student should submit a completed admission application form to the Office of Graduate and Professional Education and follow the same procedures for admission as any other applicant.

### Changing Status After Earning A Master's Degree

The master's degree is considered terminal unless the student plans to continue in a doctoral program. Students receiving their master's degree at the University of Delaware are not eligible to remain classified as graduate students and are automatically reclassified CEND (Continuing Education Nondegree) in any subsequent semester that they register following degree clearance, unless the department, with the approval of the Office of Graduate and Professional Education, has already admitted them to a doctoral program. The procedures for changing status after earning a master's degree are as follows:

- Continuing toward a doctoral degree. If a master's degree candidate is continuing toward a doctoral degree in the same major as the master's degree, the student should request that the department submit a Change of Classification Form at the same time or before the student submits an application for the master's degree. If the department is unable to determine the student's eligibility to pursue a doctoral degree until after the master's degree is awarded, the department should notify the Office of Graduate and Professional Education by writing such a statement on the student's master's degree application. A student's classification changes from regular status in a master's degree program to precandidacy when admitted to a doctoral program. If a master's degree candidate desires

## DEGREE REQUIREMENTS

to continue toward a doctoral degree in a different major than the master's degree, the student should submit a completed admission application form to the Office of Graduate and Professional Education and follow the same procedure for admission as any other applicant.

- Continuing in a second master's degree program. In the semester preceding the completion of the requirements for the first master's degree, the student should submit a completed admission application form to the Office of Graduate and Professional Education and follow the same procedures for admission as any other applicant.
- Changing to nondegree status. Students who wish to continue to earn graduate credit following the conferral of the terminal master's degree should consult the department for approval to continue as nondegree graduate students. The department will indicate approval by sending the Change of Classification form to the Office of Graduate and Professional Education for approval prior to the completion of the requirements for the master's degree. This option is primarily available for students needing to pursue a specialized certificate.

## DEGREE REQUIREMENTS

### All Graduate Degrees

The following items are University-wide graduate degree requirements. Responsibility for knowing and following the academic rules and regulations, including requirements for graduation, rests with the student. Faculty advisers assist students in planning their academic programs but are not expected to relieve the students of their responsibility. Students should consult the specific information provided in each major departmental section of this catalog for any additional requirements related to the major.

### Application for Advanced Degree

To initiate the process for degree conferral, candidates must submit an "Application for Advanced Degree" to the Office of Graduate and Professional Education. The application deadlines are February 15 for Spring candidates, January 15 for Winter candidates, May 15 for Summer candidates, and September 15 for Fall candidates. The application must be signed by the candidate's adviser and department chair. There is an application fee of \$50 for master's degree candidates and a \$95 fee for doctoral

degree candidates. Payment is required when the application is submitted. Upon completion of the audit, the Office of Graduate and Professional Education notifies students in writing when they have met all degree requirements.

### Copyright Regulations

The University reserves the right to duplicate a thesis/dissertation/executive position paper for distribution to other libraries or for the use of individual scholars. However, the University will not publish a thesis/dissertation/executive position paper for general distribution without the written consent of the author. If copyrighting is desired, it may be arranged when the thesis/dissertation/executive position paper is submitted to the Office of Graduate and Professional Education. Published works are eligible for copyright protection in the United States if the work is first published in the United States.

### Facility Of Expression In English

Candidates for the degree must have acquired the ability to express themselves clearly and forcefully in English, both orally and in writing. The major departments have the responsibility of determining whether candidates have met this requirement.

### Graduate Grade Point Average

Students must have a minimum overall cumulative grade point average of 3.0 to be eligible for the degree. In addition, the grades in courses specifically required for the degree program must average at least 3.0. All graduate-numbered courses taken with graduate student classification at the University of Delaware are applied to the cumulative index. Credit hours and courses for which the grade is below "C-" do not count toward the degree even though the grade is applied to the index. Candidates should see that all final grades have been submitted by their instructors. Temporary grades of "S" (Satisfactory) are assigned for 868 (Research) and 869 (Master's Thesis) and 969 (Doctoral Dissertation) until a final letter grade is submitted upon the completion of the thesis or dissertation.

### Thesis And Dissertation Due Dates

Master's theses are due in the Office of Graduate and Professional Education six weeks prior to the date of degree conferral. Dissertations are due in the Office of Graduate and Professional Education seven weeks prior to the date of

degree conferral. For exact due dates, see the calendar distributed by the Office of Graduate and Professional Education.

### **Time Limits For The Completion Of Degree Requirements**

Time limits for the completion of degree requirements begin with the date of matriculation and are specifically expressed in the student's letter of admission. The University time limit is ten consecutive semesters to complete the degree requirements for students entering a master's degree program. Students completing the requirements for the master's degree who are subsequently granted permission to continue toward the doctoral degree are given an additional ten consecutive semesters. Students entering a doctoral program with a master's degree are given ten consecutive semesters to complete the requirements. Students entering a doctoral program without a master's degree are given fourteen consecutive semesters to complete the requirements. Students who change their degree plan and have transferred from one degree program to another degree program are given ten consecutive semesters from the beginning of the first year in the latest program.

### **Extension Of The Time Limit**

An extension of time limit may be granted for circumstances beyond the student's control. Requests for time extensions must be made in writing and approved by the student's advisory committee and the chair of the department's graduate committee. The department will forward the request to the Office of Graduate and Professional Education. The Office of Graduate and Professional Education will determine the student's eligibility for a time extension and will notify the student in writing of its decision to grant an extension of time.

### **Master's Degrees**

In addition to the general requirements for all graduate degrees, the following regulations apply to all master's degree programs. Departments may have additional regulations beyond those stated below.

### **Credit Hour Requirements**

The minimum number of credits required for the master's degree with thesis is 24 semester hours plus 6 hours of thesis (869). The minimum number of credits for the master's degree

without a thesis is 30 semester hours. The student in a non-thesis program is usually required to pass a comprehensive examination or some other culminating requirement. Requirement of a foreign language is decided by each department as there is not a University-wide language requirement for the master's degree. A maximum of 9 graduate credit hours may be transferred from another institution to the degree. Candidates for the degree must have regular status.

### **The Master's Thesis**

The master's thesis must reflect the ability to conduct scholarly research and to report the results in a manner worthy of publication. The following items are to be submitted to the Office of Graduate and Professional Education: (1) Three original sets of the signature pages showing approval of the thesis; (2) Three copies of the abstract; (3) The thesis as a PDF file. When a thesis is required, it must be approved by (a) the chair of the committee in charge of the candidate's degree program or the advisor, (b) the chair of the department of major concentration or the chair of the committee in charge of an area of study, (c) the Dean of the College, and (d) the Provost.

### **Master's Thesis Committees**

A program of study is planned for each candidate in consultation with an advisor and/or an advisory committee. Each department determines the number of faculty that are required to serve on a thesis committee. The professor in charge of the thesis on behalf of the Advisory Committee should have established a record of publication and/or scholarship in the field of the thesis and shall be a full-time member of the faculty of the University. The definition of faculty shall include professional staff who hold secondary faculty appointments within the department. Faculty who have retired or resigned from the University may continue to chair committees of students whose work began under their direction prior to their retirement or departure from the University. Individuals who do not meet the above stated definition given for faculty status may co-chair the thesis committee provided that the other co-chair meets the definition for faculty status.

### **Doctor Of Philosophy**

The degree of Doctor of Philosophy is conferred in recognition of breadth of scholarly attainment and of demonstrated power to investigate

problems independently and effectively, rather than for the completion of definite courses of study through a stated period of time. In addition to the general requirements for advanced degrees, doctoral candidates must observe the following university requirements.

### **Admission to Doctoral Candidacy**

Upon the recommendation of the doctoral student's advisory committee and the chair of the student's major department, students may be admitted to candidacy for the Ph.D. degree. The stipulations for admission to doctoral candidacy are that the student has (1) had a program of study approved, (2) completed one academic year of full-time graduate study in residence at the University, (3) fulfilled the foreign language requirement, if any, (4) passed the program's qualifying examination(s), (5) shown the ability to do research, and (6) had a research project accepted by the advisory committee with human/animal subjects approval (if appropriate for the research).

When a student has met the requirements for admission to candidacy as explained in this chapter, the department should submit a Recommendation for Candidacy for Doctoral Degree form to the Office of Graduate and Professional Education. The student's classification will change to postcandidacy upon admission to candidacy status.

The deadline for admission to candidacy for the fall semester is August 31. The deadline for admission to candidacy for the spring semester is January 31. The deadline for admission to candidacy for the summer is April 30. Responsibility for seeing that admission to candidacy is secured at the proper time rests with the student.

### **Registration Requirements Prior to Doctoral Candidacy**

Course registration requirements are determined by the student's approved program of study. Once the student has registered for all course requirements in a program of study but has not yet met all of the stipulations for passing into candidacy, the student must maintain registration during the fall and spring semesters in course(s) or in three to twelve credits of Pre-Candidacy Study (964). Pre-Candidacy Study (964) is graded pass/fail. If the student registered in Pre-Candidacy Study is admitted to candidacy before the end of the free drop/add period of the next semester, the registration in Pre-Candidacy

Study (964) for the preceding semester may be changed to the course, Doctoral Dissertation (969). Students who are classified G1 and are holding a graduate assistantship or tuition scholarship must be registered for a minimum of six graduate credits, and those holding a fellowship must be registered for a minimum of nine graduate credits.

### **Registration Requirements after Admissions to Candidacy**

Once a student has met all of the stipulations for candidacy and becomes classified in candidacy, the student is required to register in nine credits of Doctoral Dissertation (969) (twelve credits required in the Ed.D. program). Students may not register for Doctoral Dissertation (969) until admitted to candidacy. Registration in Doctoral Dissertation (969) and Doctoral Sustaining (999) is restricted to students with candidacy. Once the student has registered in nine credits of Doctoral Dissertation (twelve credits required in the Ed.D. program), the student is required to maintain matriculation in the doctoral program by registering in Doctoral Sustaining (999) in subsequent semesters until the degree is awarded. All students must be registered in the term in which the degree is officially awarded. Sustaining registration is required in summer or winter session only if the degree is awarded at the conclusion of the summer or winter session.

### **Course and Residency Requirements**

At least three academic years of graduate academic work are normally required for the Ph.D. degree. At least one continuous academic year must be devoted exclusively to full-time study (9 credit hours per semester) in the major field in residence at the University of Delaware. This residency requirement may be fulfilled using a fall and spring semester combination or a spring and fall semester combination, but summer or winter sessions do not meet the qualification. Course credit earned in a master's program at the University of Delaware may be applied toward the doctoral degree if the candidate is receiving both degrees from the University in the same major field.

### **The Doctoral Dissertation**

The dissertation is expected to reflect the results of original and significant research written in a scholarly and literate manner worthy of publication. The dissertation defense must be completed prior to the submission date and the certification of a successful defense must

be submitted to the Office of Graduate and Professional Education. The dissertation must be approved by the chair of the student's advisory committee, the Dean of the College, the chair of the student's major department, and the Provost. The dissertation is to be signed by the professor in charge of the dissertation and all members of the dissertation committee. The following items are to be submitted to the Office of Graduate and Professional Education: (1) Three original sets of the signature pages showing approval of the dissertation/executive position paper; (2) Three copies of the abstract; (3) The dissertation/executive position paper as a PDF file; (4) Certification of Doctoral Defense; (5) Survey of Earned Doctorates.

### **Dissertation Awards**

The University recognizes excellence of dissertations by awarding four prizes each year to candidates for the degree. Committees of senior faculty make the selection for these prizes: the Wilbur Owen Sypherd Prize in the Humanities, the George Herbert Ryden Prize in the Social Sciences, the Allan P. Colburn Prize in the Mathematical Sciences and Engineering, and the Theodore Wolf Prize in the Physical and Life Sciences.

### **Doctoral Committees**

Each dissertation/executive position paper committee shall consist of not less than four members approved through appropriate departmental procedures:

- At least two members shall represent the primary area of study, one of whom shall be the committee's chairperson. The chairperson should have an established record of publication and/or scholarship in the field of the dissertation/executive position paper and shall be a full-time member of the faculty of the University; the definition of faculty shall include professional staff who hold secondary faculty appointments. Faculty who have retired or resigned from the University may chair committees of students whose work began under their direction prior to their retirement or departure from the University. An advisor who is not employed full time by the University of Delaware may serve as co-chair of the committee provided that the other co-chair meets the conditions stated above.
- One member shall represent the secondary area of study (where appropriate). If the student does not have a secondary area of study, then this member must be drawn from an area in the department outside of the primary area of study.

In either case, the member must be a full-time member of the faculty.

- At least one external member chosen from a different academic unit or from outside the University of Delaware shall be a member of the committee. The external member(s) should normally be expected to have an established record of publication and/or scholarship in the field of the dissertation/executive position paper. Students are encouraged to seek the external member from outside the University in order to broaden the perspectives of the committee. Faculty at the University of Delaware who serve in the capacity of an external member may have a secondary or adjunct appointment in the doctoral candidate's unit, but the primary appointment must be in a different unit.

In general, doctoral committees should strive to achieve consensus concerning the student's performance and quality of work. In the case of dissenting votes, the majority opinion rules and a majority vote in favor is needed for a successful defense.

### **Examination - Pre-Candidacy**

Doctoral students must prove to their advisory committee that they have acquired a comprehensive grasp of their major and minor fields of study through a qualifying examination (written, oral, or both) before they are admitted to formal candidacy.

### **Examination - Post-Candidacy Defense**

Upon completion of the dissertation, a final oral examination must be passed, consisting of a defense of the dissertation and a test of the candidate's mastery of the fields covered in the program. The final oral examination is conducted by the student's advisory committee, together with other examiners approved by the departmental faculty. To permit adequate time for the examiners to review the dissertation, all copies of the tentatively completed dissertation (subject to revisions required by the examining committee) must be deposited in the departmental office at least two weeks before the date of the final oral examination. A department may increase this period if a particular dissertation requires longer study or if the number of dissertations presented makes it impractical to review them thoroughly in a two-week interval. The department shall submit certification of a successful defense to the Office of Graduate and Professional Education.

## College of Agriculture and Natural Resources

### Modern Foreign Language Requirement

There is no University-wide language requirement for the degree of Doctor of Philosophy. The need for proficiency in another language will be determined in accordance with the standards set by the student's major department. Candidates should complete the language requirement as soon as possible after admission to doctoral standing. The language requirement must be met prior to admission to candidacy.

### Secondary Areas

In some programs, studies that add to the student's fundamental knowledge and develop a research point of view must be pursued in at least one related subject. This may be a separate branch of the field in which the major work is done.

### Survey of Earned Doctorates

The Survey of Earned Doctorates form must be completed by all candidates for the doctoral degree. This form is provided by the Office of Graduate and Professional Education.  
Doctor Of Education

The degree of Doctor of Education is conferred in recognition of distinguished achievement in the field of educational leadership. There are two concentrations within the Educational Leadership major: Administration and Policy for students interested in management, and Curriculum, Technology & Higher Education for classroom-based educators. Specific course requirements differ according to concentration, but both concentrations require 54 credit hours of graduate work, including 42 hours of doctoral study and 12 hours of research and writing for the "executive position papers." A student may transfer a maximum of nine hours of graduate work (post-master's) for which a grade of B or better was earned from an accredited institution of higher learning. Students have five years to complete the degree, with extensions granted only for extraordinary circumstances. A cumulative grade point average of 3.0 must be maintained in the courses. Students must complete and defend a proposal for their executive position papers, and later defend in open session the completed papers. Each student has a committee with an advisor/chair and three or four additional members, one of whom must be from outside the College of Education and Human Development.

## College of Agriculture and Natural Resources

The College of Agriculture and Natural Resources offers graduate education through all of its academic departments: Animal and Food Sciences, Bioresources Engineering, Entomology and Wildlife Ecology, Food and Resource Economics, and Plant and Soil Sciences. Each department offers programs leading to the Master of Science degree; additionally, programs leading to the Doctor of Philosophy degree are offered in Animal Science, in Entomology and Wildlife Ecology, Operations Research, and in Plant and Soil Sciences. The College manages an MS degree program cooperatively with Longwood Gardens in the area of Public Horticulture. Additionally, the MA degree is offered in Agricultural Education through the Department of Food & Resource Economics.

The College is interested in attracting highly qualified students with a desire to enter into research and teaching. Professors are formally responsible for research projects in the Delaware Agricultural Experiment Station, and students often move into a facet of an established research project. Close association with the departmental research program affords opportunities to broaden a student's perspective of the research process. Each department has several areas of focus within the discipline.

The Department of Animal and Food Sciences has three graduate degree offerings: the PhD in Animal Science, the MS in Animal Science and the MS in Food Science. In Animal Science, a student may specialize in animal physiology and nutrition; avian microbiology, immunology and pathology; avian molecular biology, genomics, and bioinformatics; and ruminant nutrition, microbiology, and physiology. The MS program in Food Science emphasizes food safety with a focus on food processing and packaging.

The Department of Bioresources Engineering offers a MS degree in Bioresources Engineering and research opportunities through the Operations Research program (see Food & Resource Economics) with studies involving soil and water resources, or environmental issues.

The Department of Entomology and Wildlife Ecology offers graduate opportunities in both applied and basic research dealing with insects, birds, mammals, and other wildlife. Areas of emphasis include ecology, plant-insect interactions, biological control, and conservation biology.

The Department of Food and Resource Economics offers areas of study in quantitative economics, international agricultural trade, economic development, resource economics, marketing and policy. Also housed in the department is the Statistics program, which offers an MS in Statistics, and the interdisciplinary Operations Research program, which offers the MS and the PhD.

In Plant and Soil Sciences, areas of study include plant breeding, tissue culture, molecular biology, pathology, plant improvement, physiology and horticulture. In Soil Science the areas are soil chemistry, biochemistry, microbiology and management. A specialized MS program, the University of Delaware/Longwood program in Public Horticulture is a 2-year Master's degree program requiring a thesis.

The College of Agriculture and Natural Resources houses modern research laboratories and equipment in Worrilow Hall, Townsend Hall, the Charles C. Allen, Jr. Laboratory, the Fischer Greenhouse Laboratory, the Delaware Biotechnology Institute, and other buildings located on the Delaware Experiment Station. Field plots, a 35-acre woodlot, and animal research facilities are available for graduate research. An excellent library and computing site are located in the college. For more information, please see <http://ag.udel.edu/>.

## **Agricultural Education (MA)**

Telephone: (302) 831-1357  
<http://ag.udel.edu/>

### **Program Overview**

The Agricultural Education Program offers a Master of Arts (MA) degree that qualifies the individual for initial teacher certification in the areas of agricultural and natural resources education. Recent undergraduate students or career changers in the areas of agriculture and natural resources or in various technology fields are likely candidates for this degree program.

The pragmatic, hands-on program provides pedagogical skills and uses an investigative, scientific, design-and-construct, and problem solving approach to teaching. The curriculum is designed to allow students to teach in both the classroom and laboratory setting.

### **Requirements For Admission**

In addition to the general graduate admission

requirements of the University, all applicants are required to have satisfactorily completed an approved undergraduate baccalaureate program of study and may not be certified or employed as a teacher. For students lacking appropriate preparatory course work, additional courses applicable to certain areas of study may be required prior to admission, or students may be admitted with the provision that certain content courses be completed concurrent with the courses in the degree program. On a 4.0 system, applicants must have a general undergraduate academic index of 2.5 and a minimum 2.75 index in their major field of study. Applicants must have a combined score of at least 1050 on the verbal and quantitative portions of the GRE. Students for whom English is not their first language must attain a minimum score of 600/250/100 on the paper based/computer based/IBET/TOEFL examination. All students must provide three letters of recommendation from individuals able to assess the applicant's academic potential. The deadline for application is April 2 of each year. Admission to graduate programs at the University of Delaware is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

### **Requirements For The MA Degree**

Students are required to complete a minimum of 33 credit hours, including 21 credit hours of professional education courses, 9 credit hours of an Internship in Teaching, and a three credit Student Teaching Seminar, which is the final requirement for the degree. The Internship in Teaching is a placement in a middle and/or secondary school and, with the degree, prepares a student for initial certification in Agricultural and Natural Resources Education. To be awarded the degree, students must achieve a cumulative GPA of 3.0 on a 4.0 scale for all graduate course work taken and a minimum grade of B in AGED 600 (Internship in Teaching).

## **Animal and Food Sciences (MS, PhD)**

Telephone: (302) 831-2524  
<http://ag.udel.edu/anfs/>  
Faculty Listing: <http://ag.udel.edu/anfs/ourfaculty.php>

## Program Overview

The Department of Animal and Food Sciences offers three graduate degree programs: The Master of Science (MS) degree in Animal Science, the MS degree in Food Science and the Doctor of Philosophy (PhD) degree in Animal and Food Sciences.

In Animal Science, research programs are offered in physiology; ruminant and poultry nutrition; microbiology, immunology and pathology; molecular biology, genomics, and bioinformatics.

In Food Science, research programs are offered in food biochemistry, bacteriology, virology, parasitology, toxicology and processing.

## Research Facilities

Well-equipped laboratories for conducting research are located in Worrilow and Townsend Halls, the Allen Biotechnology Laboratory, and the Delaware Biotechnology Institute (DBI). The Allen Biotechnology Laboratory is a state of the art, biosafety level 2 and 3 facility for the study of conventional and highly pathogenic avian disease agents and recombinant poultry microorganisms. The department maintains dairy cattle, beef cattle, sheep, horses, and poultry for instruction and research on the Delaware Agricultural Experiment Station Farm.

## Requirements for Admission

An applicant for graduate study in Animal and Food Sciences should have an appropriate background from the Baccalaureate degree, with a minimum cumulative grade point average of 2.75, and a 3.00 average in his/her major. Undergraduate preparation for most areas of study should include general and organic chemistry, biology/microbiology, biochemistry, physics, and calculus. For students lacking appropriate preparatory course work, additional courses applicable to certain areas of study may be required prior to admission. A Graduate Record Examination combined score (quantitative + verbal sections) of 1075 on the general exam is desirable. Exceptions may be made for students with special backgrounds, abilities, and interests. All students must provide three letters of recommendation from former professors, a completed Graduate Studies Application form, and a completed assistantship form if applying for financial aid. Foreign students must demonstrate competence in the use of the English language

by a minimum score of 575/233/85 on the paper based/computer based/IBETTOEFL and provide evidence of sufficient financial support for the course of the degree program. Foreign students applying for a teaching assistantship must have a minimum score of 600/250/100 on the paper based/computer based/IBETTOEFL examination. Applicants may be requested to visit the department for a personal interview before a final decision concerning admission is made. Admission to the graduate program is dependent upon availability of an appropriate faculty advisor in the student's area of study.

## Financial Aid

Please refer to the Graduate Fellowships and Assistantships section for more information.

## Requirements for the Degrees

The MS degree program in Animal Science and the MS degree program in Food Science require a minimum of 30 graduate credit hours of which six credits must be ANFS 869 Master's Thesis. The programs are expected to be completed in 2-2.5 years of full-time study. All students pursuing the MS degree will complete the following core courses; ANFS 865 Seminar and CHEM 527 Introductory Biochemistry or CHEM 641 Biochemistry, and a statistics course [FREC 608 Research Methods, FREC 806 Research Techniques and Procedures, or equivalent]. Attendance in ANFS 865 Seminar is required each semester for all graduate students. A maximum of three credits of ANFS 668/ANFS 868 Research or ANFS 666/ANFS 866 Special Problem may be applied towards the MS degree. Course selections are made with the approval of the student's graduate committee. A research proposal and thesis are required for the MS degree. Students, with the assistance of their advisor, will prepare and present a research proposal to their graduate committee for review and approval of the proposed research project. Following completion of the research outlined in the proposal, the MS degree candidate will prepare a written thesis according to the guidelines set forth by the Office of Graduate and Professional Education. A thesis defense, preceded by a seminar, will be held. The student's advisor and graduate committee will administer and evaluate the thesis defense.

The PhD degree program provides the necessary flexibility to design an appropriate plan of study and has only minimal course requirements. A doctoral committee will be appointed within six months following matriculation. The

committee shall consist of between four and six faculty or professional members nominated by the graduate advisor and approved by the Department Chairperson. Participation from industry, government or other academic departments on the doctoral committee may be required depending on the student's area of research. At least one member of the committee shall be from outside the Department of Animal and Food Sciences; however, not more than half of the committee members shall be from outside the Department. Departmental Adjunct Faculty shall be considered as "outside" members in their participation on doctoral committees. The committee is responsible for approving the student's course work and research program. The committee will prepare, administer, and evaluate the student's comprehensive and final examinations and will supervise and approve the dissertation. The student's faculty advisor serves as chair of the doctoral committee.

**Core Courses and General Requirements.** All students pursuing the PhD will complete the following core courses; ANFS 865 Seminar, ANFS 969 Doctoral Dissertation, CHEM 641 Biochemistry, CHEM 642 Biochemistry, and a statistics course [FREC 608 Research Methods, FREC 806 Research Techniques and Procedures, or equivalent]. Attendance in ANFS 865 Seminar is required each semester for all graduate students. Beyond the core courses, no specific number of courses completed or credits earned are uniformly required. The student and advisor in concert with the doctoral committee will select appropriate course work based on the student's background and major and minor (if applicable) area(s) of specialization for the PhD. Consideration will be given to the student's prior training and experience at the undergraduate (B.A. or B.S.) and MS and/or D.V.M./V.M.D. (if applicable) level(s). Students with more advanced training and experience will need fewer courses to complete their PhD program. General requirements for the PhD are based on the university residency requirement, writing of a satisfactory research proposal and dissertation, and passing the comprehensive and the final oral examinations. The candidate's doctoral program will consist of a combination of doctoral committee-approved formal courses, seminars, individual study, and research credits as needed by the student.

**Research Proposal.** Advancement to degree candidacy requires successful oral defense of a research proposal. The proposal will be submitted to the doctoral committee at least two weeks prior to the scheduled defense.

The student will give an oral presentation summarizing the proposal. The committee members will question the student to verify that the student understands the research problem and the experimental approaches needed to address it. The committee will also ensure that the student has the proper training and resources to do the research. As a result of the meeting, the student may be required to revise the proposal and/or take additional course work. The research proposal defense should precede the comprehensive examination.

**Comprehensive Examination.** Successful completion of the comprehensive examination is required of all PhD students prior to their admission to candidacy. The examination, administered by the student's graduate committee, is normally given to the student after completion of all course work and selection of a dissertation topic. The student is required to have a minimum grade point average of 3.0 (4 point scale) at the time of the examination. The written portion of the comprehensive examination will be to prepare and present a research proposal following the formats of one of the following government agencies: USDA (AFRI), NIH or NSF. The topic of the proposal must be outside the primary area of study. The student will follow the proposal preparation guidelines of the chosen granting agency to generate the "Project Description" portion of the proposal. References cited in an accepted bibliographical format are required. The student will have one month to prepare the proposal, which must then be distributed to committee members at least two weeks prior to the presentation and defense. The format of the examination will be presentation by the student, followed by a question and answer period focussed primarily on the proposal, but may be expanded to include other appropriate subject areas. A favorable vote by a majority of the committee including the major advisor is required for passing. Based on the performance of the student in the comprehensive examination, the committee may recommend one of the following actions:

- The student be admitted to candidacy, without qualification or subject to fulfillment of certain conditions.
- The student be reexamined at later date.
- The student be disapproved unconditionally for the degree.

**Dissertation.** The ability to conduct independent research and competence in scholarly writing must be demonstrated by the preparation of a dissertation on a topic related to the major

area of specialization in accordance with the regulations of the Office of Graduate and Professional Education. The contents and conclusions of the dissertation must be defended at the time of the Final Oral Examination (see below) and approved by the doctoral committee. Copies of the dissertation must be available in the departmental office at least ten working days before the date of the Final Oral Examination. Preparation of (a) manuscript(s) for publication of the information contained within the dissertation is expected prior to, or within one month after, approval of the dissertation by the committee at the Final Oral Examination.

**Final Oral Examination.** Upon recommendation of the doctoral committee, a Final Oral Examination of the dissertation will be scheduled for the doctoral candidate who has satisfied all other requirements for the degree. The examination must be scheduled at least three weeks prior to the time the examination is to be held. The examination shall be related in a large part to the dissertation but it may cover the entire field of study of the candidate. The examination will be administered by the student's doctoral committee. The student will give an oral presentation (seminar) summarizing the dissertation research. Committee members will question the student about the dissertation and related subject areas to verify that the candidate fully understands the research findings and their implications. A favorable vote of a majority of the members of the committee is required for passing. If the candidate fails, it is the responsibility of the doctoral committee to determine whether he/she may take another examination.

## **Bioresources Engineering (MS)**

Telephone: (302) 831-2468

For more information, <http://ag.udel.edu/>

Faculty Listing: <http://ag.udel.edu/breg/faculty/facultyStaff.htm>

### **Program Overview**

The Master of Science in Bioresources Engineering is a vibrant and diverse program that allows students to study land and water resources or plant and animal systems. The program especially encourages interdisciplinary education and research and provides the students with a greater choice and flexibility in shaping their education. Students are encouraged to address "real world" problems and participate in "hands-on" field and laboratory experiences so that they are better

prepared to take on future challenges in industry, government, and academia.

### **Research Areas**

The BREG Masters Degree program focuses on two areas: land and water resources and plant and animal systems. Potential research areas for students concentrating on land and water resources include projects in nonpoint pollution, stormwater and watershed management, water quality modeling, bioremediation, land application of wastewater, irrigation water management and vegetative control on drainage ditches. Representative projects for students focusing on plant and animal systems vegetable harvesting, animal physiology, poultry welfare, poultry house environmental management and sensor technology

### **Research Facilities**

The department maintains research laboratories equipped for soil and water analysis, machine design and fabrication, and applied poultry research in WorriLow Hall. Students have access to mainframe and microcomputers for data collection, analysis and presentation and an excellent library in the College of Agriculture and Natural Resources.

### **Requirements for Admission**

An applicant for graduate study in Bioresources Engineering should have an appropriate Baccalaureate degree in engineering or a related field with a minimum cumulative grade point average of 2.80 and a 3.00 average in his/her major. Applicants should have a strong science or engineering background and have completed mathematics through differential equations. For students lacking appropriate preparatory course work, additional courses applicable to certain areas of study may be required prior to admission. A Graduate Record Examination combined score (quantitative + verbal sections) of 1050 on the general exam is required. Students need to supply a minimum of at least three letters of recommendation that address the student's likelihood of successfully completing graduate education from former instructors or supervisors. Exceptions may be made for students with special backgrounds, abilities, and interests. International students must demonstrate competence in the use of the English language by a minimum score of 550 / 213 on the paper based/computer based TOEFL. Admission to the graduate program may be

dependent upon availability of an appropriate faculty advisor in the student's area of study.

#### Financial Aid

Graduate students in good standing generally receive financial support from a research assistantship, departmental assistantship or fellowship. Graduate students on an assistantship or fellowship are expected to give their full-time attention to graduate study. Please refer to Graduate Fellowships and Assistantships for more information.

#### Master of Science Degree Requirements

A minimum of 30 credits are required for the Bioresources Engineering Master of Science degree. It is to include 24 credits of approved course work and 6 credits of thesis (BREG 869). All students enrolled in the program will be required to take BREG 631 Experimental Methods for Engineers and a graduate level advanced mathematics or statistics course.

Students may choose their advanced mathematics or statistics course from the following list including, but not limited to:

CIEG 601	Introduction to the Finite Element Methods
CIEG 605	Intermediate Topics in Finite Element Analysis
MATH 503	Advanced Calculus for Applications
MATH 508	Introduction to Complex Variables and Applications
MATH 535	Introduction to Partial Differential Equations
MATH 611	Introduction to Numerical Analysis and Scientific Computing
MEEG 891	Advanced Engineering Mathematics
STAT 601	Probability Theory for Operations Research and Statistics
STAT 611	Regression Analysis
STAT 635	Statistical Quality Control
STAT 657	Statistics for Earth Scientists

Only graduate level courses (500-599), (600-699), (800-899) are applicable towards the course requirements. Selection of courses will be done in consultation with the chair of the thesis committee based upon the student's interest and area of research. The programs are usually expected to be completed in two years of full-time study.

Following completion of the research outlined in the proposal, the MS degree candidate

will prepare a written thesis according to the guidelines set forth by the Office of Graduate and Professional Education. A thesis defense, preceded by a seminar, will be held. The student's advisor and graduate committee will administer and evaluate the thesis defense.

Entering students may also choose a non-thesis option in which the students develop state-of-the-art background through course selection rather than complete an independent research project. The non-thesis option is available in Land and Water Resources, but not in Plant and Animal Systems. Students originally enrolled in the thesis master's degree program may not transfer to the non-thesis option except under special circumstances and with the approval of their thesis advisor and the departmental Graduate Committee.

#### Land and Water Resources Non-Thesis Option Core Course Credits:

BREG/PLSC 603	Soil Physics	3
BREG 621	Nonpoint Source Pollution Control	3
BREG 622	Watershed Modeling	3
BREG 623	Advanced Storm Water Management	3
BREG 631	Experimental Research Methods	3
	Additional 600 level or above mathematics or statistics course	3

#### Electives

	Five courses (600 level or above) taken with approval of faculty advisor	15
TOTAL	30	

Graduate students must maintain a minimum GPA of 3.00 to remain in good academic standing. GPA requirements are monitored by the Office of Graduate and Professional Education according to the Graduate Studies Academic Probation Policy.

#### Entomology and Wildlife Ecology (MS, PhD)

Telephone: (302) 831-2526

<http://ag.udel.edu/>

Faculty Listing: <http://ag.udel.edu/enwc/faculty/facultyStaff.htm>

#### Program Overview

The Department offers programs leading to the Master of Science (MS) in Entomology, MS in Wildlife Ecology, and the Doctorate of

Philosophy (PhD) in Entomology and Wildlife Ecology. Graduate students in these fields couple a focus on insects or vertebrates with a broad knowledge of other related fields of biology, especially ecology. The MS degree programs prepare students for pursuit of the PhD. While it is possible to go directly to the PhD program, the Department Faculty prefers that students complete the MS degree before being admitted or reclassified into the doctoral degree program in Entomology and Wildlife Ecology.

#### Research Facilities

Facilities to support graduate study in the department include laboratories; an insectary; programmed growth chambers; a greenhouse; field plots and a 35-acre woodlot on the experimental farm; collections of pinned, liquid, and slide specimens of insects, amphibians and reptiles; bird and mammal skins; equipment for DNA analysis; a capillary gas chromatograph; advanced optical systems; and an excellent library collection of pertinent journals and books. The USDA Beneficial Insects Introduction Research Unit located on the campus and several preserves, parks, and wildlife areas, research centers, governmental organizations, and companies located nearby offer additional opportunities for field and laboratory study.

#### Requirements For Admission

Minimum requirements for admission to the master's and doctoral degree programs are an undergraduate academic index of 2.8 overall and 3.0 in the major field of study and a combined score of 1050 on the verbal and quantitative portions of the GRE. Graduate GPA (if applicable) should be at least 3.2. A paper-based TOEFL score of at least 550 (or 213 computer-based, 79 on IBET) is required for international students. The Advanced GRE in Biology is required with a minimum score of 580 for PhD applicants.

#### Financial Aid

Graduate students in good standing generally receive financial support from a research assistantship, teaching assistantship or fellowship. Graduate students on an assistantship or fellowship are expected to give their full-time attention to graduate study. Please refer to the Graduate Fellowships and Assistantships section for more information.

#### Master of Science Degree Requirements

General requirements for both MS majors are:

(1) completion of at least 30 graduate credit hours, including a thesis describing independent research (6 credit hours); (2) passing an oral, general knowledge examination centering on the student's program of study; (3) presenting the thesis research in a formal departmental seminar; and (4) passing a thesis defense. Students in the Entomology major also must pass an Insect Family Recognition Test.

#### Core MS Degree Courses for Both Majors

ENWC 814	Advanced Ecology	3
ENWC 870	Graduate Research Seminar	0
ENWC 888	Topics in Entomology and Wildlife Ecology	0
ENWC 869	Master's Thesis	6
	A graduate-level statistics course	3

#### Entomology Major

ENWC 605	Insect Structure and Function	4
ENWC 606	Insect ID - Taxonomy	3
	One other graduate level course primarily on insects	3

(Obtain list from department for qualified courses)

#### Wildlife Ecology Major

Two of the following:

ENWC 615	Wildlife Research Techniques	3
ENWC 618	Ornithology	3
ENWC 620	Behavioral Ecology	3
ENWC 624	Herpetology	3
ENWC 625	Mammalogy	3
ENWC 635	Population Ecology	3

#### Additional Coursework (both MS programs)

Students must earn additional graduate credit hours appropriate to the major to bring the total earned to at least 30 credits. A maximum of 3 credits in ENWC 666, ENWC 668, ENWC 866, and ENWC 868 and 6 credits of ENWC 869 can be applied to the degree.

#### Doctor of Philosophy Degree Requirements

Doctoral students entering the program with an MS must complete a total of at least 30 graduate credits.

Doctoral Students in Entomology and Wildlife Ecology must complete the following courses or their equivalent for both concentrations, either before or during their program at Delaware:

ENWC 814	Advanced Ecology	3
ENWC 870	Graduate Research Seminar	0
ENWC 888	Topics in Entomology & Applied Ecology	0
	6 credits of graduate statistics (600-level or above)	6

9 credits of Doctoral Dissertation  
(ENWC 969) 9

Doctoral students must satisfy the requirements of at least one of two concentrations, Entomology or Wildlife Ecology, by completing the following courses or their equivalent under the selected concentration, either before or during their program at Delaware.

#### Entomology Concentration

ENWC 605 Insect Structure & Function 4

ENWC 606 Insect ID - Taxonomy 3

One other graduate level course primarily on insects 3

(Obtain list from department office for qualified courses)

#### Wildlife Ecology Concentration

Two of the following:

ENWC 615 Wildlife Research Techniques 3

ENWC 618 Ornithology 3

ENWC 620 Behavioral Ecology 3

ENWC 624 Herpetology 3

ENWC 625 Mammalogy 3

ENWC 635 Wildlife Population Dynamics 3

If any of the above course requirements are completed before starting the PhD program, substitute courses counting toward the total minimum credits must be approved by the student's graduate committee. Students entering with a B.S. must complete a total of at least 60 graduate credits while enrolled in the program. A maximum of 3 credits in ENWC 666, ENWC 668, ENWC 866, ENWC 868, and 9 credits of ENWC 969 can be applied to the doctoral degree.

### **Food and Resource Economics (MS, PhD)**

Telephone: (302) 831-2511

<http://ag.udel.edu/>

Faculty Listing: <http://ag.udel.edu/frec/faculty/facultyStaff.htm>

The Department of Food and Resource Economics administers graduate programs in Agricultural and Resource Economics, Operations Research, and in Statistics.

### **Agricultural and Resource Economics (MS)**

#### Program Overview

The program in Agricultural and Resource Economics leads to the Master of Science degree and offers students the perspectives

and skills necessary to understand and work in the agribusiness or government sectors of the economy. Also, a strong intermediate level of training is offered so that students may continue graduate work and obtain the PhD degree. The department has ready access to computer terminals for mainframe computer connection and microcomputers.

#### Requirements for Admission

Students making application are required to have satisfactorily completed an approved undergraduate program of study. On a 4.0 system, applicants must have a general academic index of 3.0. Students who have an academic index below 3.0 may be granted provisional admission if they have Graduate Record Examination scores above 1050 with good letters of reference. Students for whom English is not their first language must attain a minimum score of 550/213/79 on the paper based/computer based/IBET on the TOEFL examination. Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

#### Requirements for the Degree

Students are required to complete a minimum of 30 credit hours including either a thesis or a non-thesis option. Under the thesis option, students complete 24 hours of course work and 6 hours of thesis work. Under the non-thesis option, students complete 27 hours of course work and 3 hours of a directed project. All students must take ECON 801 and either ECON 552 or ECON 802. All students must take four of the following quantitative courses: FREC 608, FREC 615, FREC 674, FREC 682, FREC 801, ECON 822 and ECON 823. Students writing a thesis must take two 800-level FREC courses while students under the non-thesis option must take three 800-level FREC courses from the following: FREC 810, FREC 826, FREC 827, and FREC 834. In addition, no more than three credits of independent study may be taken unless approved by the department chair, advisor and the department graduate committee. Agricultural and resource economics courses taken previously may partially meet the requirements if they do not count towards the fulfillment of another degree.

The student plans a course program in consultation with the major professor, in order to attain competency in economics, quantitative methods, and agricultural and resource economics.

Students must achieve an overall index of 3.0 on a 4.0 scale for all graduate course work taken. The student's progress toward the degree will be monitored by the academic adviser and the department graduate committee.

A student choosing the thesis option is required to prepare a thesis that reflects a substantive analysis of a subject in the field of agricultural and resource economics. An oral examination covering both course work and thesis will be given to determine whether the student has a breadth of understanding of the field. A student selecting the non-thesis option is required to complete a directed research project to be presented at a department seminar. Operations Research (MS, PhD)

## **Operations Research (MS, PhD)**

Telephone: (302) 831-6242

<http://ag.udel.edu/frec/grad/ORprograms.htm>

### Program Overview

The Operations Research Program at the University of Delaware is an interdisciplinary graduate program, drawing its faculty and students from various participating academic units that include: the College of Agriculture and Natural Resources (Bioresources Engineering and Food and Resource Economics), the College of Business and Economics (Business Administration and Economics), the College of Engineering ( Civil and Environmental Engineering and Electrical and Computing Engineering), the College of Arts and Sciences (Computer and Information Sciences, Mathematical Sciences, School of Urban Affairs and Public Policy), and the College of Earth, Ocean, and Environment. Programs of study are tailored to student and faculty interests and emphasize research and internship. Course work includes a core in operations research, mathematical optimization, statistics, and applied probability, in addition to supporting courses related to areas of application.

### Requirements for Admission

Admission to the Operations Research Program is selective and competitive based on the number of well qualified applicants and the limits of available faculty and facilities. Those

applicants who meet the stated minimum academic requirements are not guaranteed admission, nor are those applicants who fail to meet those minimum requirements necessarily precluded from admission if they offer other appropriate strengths.

A student must have a minimum average grade of B in undergraduate studies with a grade of B or higher in calculus and linear algebra and a minimum combined verbal and quantitative score of 1150 on the Graduate Record Examination. Foreign students must have a minimum TOEFL score of 600/250/100 on the paper based/computer based IBET for admission to the Operations Research Program, and are encouraged to take the TSE.

Students should send all application materials to the office of Graduate Studies. For fall admission, the application deadline is February 1. For spring admission, the application deadline is October 1.

### Financial Aid

Various forms of partial and comprehensive financial aid are available on a competitive basis to students with excellent credentials. Applications for aid should be made along with the application for admission. At present, a high proportion of full time students receive some financial support after having initially established very good academic records in the Operations Research Program at the University of Delaware.

Teaching assistantships and research assistantships provide a stipend plus full tuition for fall and spring semesters. Additional stipends are sometimes available for summer. Students on teaching or research assistantships work up to 20 hours per week (partially funded students work 10 hours per week) and are expected to maintain full time status (9 credit hours per semester). Teaching assistants help with departmental instruction. Research assistants typically work on faculty research projects. Assistantships are normally awarded on the semester basis, are reviewed after each semester, and are renewed if the student's overall performance (academic performance and work responsibilities) in the program is satisfactory.

During the second year of study, students can also work for 20 hours per week during the academic year and 40 hours during the summer and Winter Sessions as corporate interns in the Corporate Operations Research

Program (CORP). The intern's performance is evaluated each semester and the internship is continued subject to performance, availability of funds, and corporate needs. Interns are expected to maintain full-time graduate student status. In most cases internships are paid work experiences and if the company participates in the CORP program the tuition for interns is borne by the University.

### Requirements for the Degrees

Students should acquire through the program:

Standard working knowledge of OR models and solution techniques including:

- assumptions and limitations of models
- an understanding of why analysis of a model should yield the results received
- ability to question results for consistency and logic
- appreciation of sensitivity analysis

Art of model building (i.e., ability to fit models to problems)

- Computer skills (such as programming and software applications)
- Presentation skills
- Appreciation of recent literature on:
  - a. A problem domain of student's choice and
  - b. Advances in an OR technique and relations to practical problem solving.

The student is encouraged to select an advisor among the affiliated or core faculty at the early stage of enrollment. The director of the program will assist in the search. After the first semester, but no later than during the second semester, a student should have an advisor for course selection and thesis/dissertation purposes. Changes in the advisor are possible with special justification, but all concerned, including the director of the program, must agree. The program encourages co-advisors for students, if it is in their interest.

The Master's Program allows students to take either of the thesis or non-thesis option. The thesis option requires a research-oriented thesis (six credits) and course work including the ORES 600 level sequence, OR related courses, two semesters of seminar attendance, and course offerings in the area of application, for a total of 33 credit hours. A thesis committee consisting of at least four members, two of which are OR faculty, should be formed after the first year of study to advise the candidate and administer

the thesis defense exam. One member should be external to the student's home department. The non-thesis option requires an internship and a related report in place of the thesis. Students can also participate in a formalized internship program called CORP (Corporate Operations Research Program). Students in this program usually intern at the corporation during the academic year (September to May), for 20 hours per week and for 40 hours per week during the Summer and Winter sessions.

The PhD Program prepares well qualified students for management, research or teaching careers in industry, government or academia. Dissertations for the PhD degree are a blend of empirical and theoretical research combining OR methodologies with application from a particular discipline. A dissertation committee consisting of at least five members, three of whom are OR faculty, should be formed after the second year of study to advise the candidate and administer the final dissertation defense exam. The degree requires at least 51 credit hours, with nine credits fulfilling the dissertation requirement and the remainder about equally divided among OR related courses and course offerings from the area of application. PhD candidates must take the ORES 800 level course sequence and register for two semesters of seminar attendance. Comprehensive exams are administered in three areas (OR and two of the student's chosen concentration areas) after a majority of the course work has been successfully completed. Statistics (MS)

## Statistics (MS)

### Requirements For Admission

Candidates for admission to the statistics program need not have majored in any specific undergraduate field as a prerequisite for admission. However, competence is expected in linear algebra, advanced calculus, and computer programming. On a 4.0 system, applicants should have a GPA of at least 2.5 and an average of at least 3.0 in mathematics and related areas. Applicants who have completed an advanced degree must have done so with a GPA of at least 3.0. In addition, applicants must take the GRE Aptitude Test.

### Requirements For The Master's Degree In Statistics

Candidates for the MS degree choose one of the following programs:

- I. Master's with Thesis
- II. Master's without Thesis
- III. Master's Internship Program

The student pursuing any of these programs must complete the following courses:

STAT 601, STAT 602, STAT 603, STAT 611, STAT 615 and STAT 617.

Three semesters of the one credit-hour course STAT 641 (Statistical Laboratory).

A student who has taken any of the 600 level statistics requirements as an undergraduate must substitute other statistics courses subject to his or her advisor's approval.

#### Program I

In addition to the required courses above, Program I requires six additional credits of course work and six hours of thesis credits. The department maintains a list of approved courses. The completed thesis will be presented at a departmental seminar.

#### Program II

In addition to the required courses above, Program II requires 12 additional credits of course work. The department maintains a list of approved courses.

#### Program III

In addition to the required courses above, Program III requires six additional credits of course work and six hours of internship credit. The department maintains a policy for internship requirements and procedures. Plant and Soil Sciences (MS, PhD)

### **Plant and Soil Sciences**

Telephone: (302) 831-8153

<http://ag.udel.edu/>

Faculty Listing: <http://ag.udel.edu/plsc/faculty/facultyStaff.htm>

#### Program Overview

The Department of Plant and Soil Sciences offers graduate programs that lead to degrees of Master of Science and Doctor of Philosophy in plant and soil sciences. The objectives of the programs are to equip the student with background and techniques necessary for degree completion, opportunities for advanced

study in the plant and soil sciences, and for job placement.

In addition to modern research facilities in Worrielow Hall and at the Delaware Biotechnology Institute (DBI), special items available for student research include field, state-of-the-art greenhouse and growth chamber facilities, radioisotope room, scintillation counters, gas and liquid chromatographs, x-ray diffractometer, Fourier transform infrared spectrometer, pressure-jump relaxation apparatus, atomic absorption spectrophotometers, inductively coupled plasma spectrometer, low- and high-speed centrifuges, microtomes, electrophoretic apparatus, cold rooms, atomic force and electron microscopes, carbon-nitrogen-sulfur analyzer, DNA sequencers, and a bioinformatics center.

#### Requirements For Admission

Students seeking admission must provide Graduate Record Examination scores, grade transcripts, evaluation by three professionals, evidence of English language proficiency for applicants whose native tongue is not English, and a completed Graduate Studies application form. A member of the department also must agree to serve as the faculty advisor or rotation coordinator for the student.

#### Financial Aid

Please refer to the Graduate Fellowships and Assistantships section for more information.

#### Requirements For The Degrees

A minimum of 30 semester hours is required for the Master of Science degree, to include 24 semester hours of approved course work and 6 hours of thesis PLSC 869. All MS students must take a minimum of 12 hours in one of two research areas (plant biology or soil science), and they must register in PLSC 802 Professional Development. In addition to the University general requirements for advanced degrees, the awarding of the Master of Science degree is contingent upon an approved research proposal, the successful oral defense of research performed, and an acceptable thesis. A non-thesis Master's degree is also offered. Students must complete 30 credits of coursework, present a seminar (PLSC 865) that is based on a required independent study project (PLSC 666), complete PLSC 802, and pass an oral examination administered by the student's graduate advisory committee at the end of the degree program. Advancement to PhD degree candidacy is

contingent upon an approved research proposal and successful completion of written and oral qualifying examinations administered by the student's advisory committee. There is no minimum number of course credits required, but candidates must register for nine credits of Dissertation (PLSC 969), must register for PLSC 802 Professional Development, and must present an acceptable dissertation.

An approved program of study is required for all degrees. The program is developed with close supervision and assistance of a faculty adviser and advisory committee and arranged according to the academic and professional needs of the student. The program is usually developed by the end of the first semester of study. There is no language requirement other than English proficiency for the Master of Science or Doctor of Philosophy degree.

## Public Horticulture (Longwood Graduate Program) (MS)

Telephone: (302) 831-2517

<http://www.udel.edu/longwoodgrad>

### Program Overview

The Graduate Program in Public Horticulture was established at the University in 1967 with the support of Longwood Gardens. The Program is thesis driven and leads to the Master of Science degree; it is unique in its educational approach to leadership in the public horticulture profession. Graduates have found employment in arboreta, botanical gardens, display gardens, horticultural societies, Cooperative Extension, park systems, and garden-related foundations. Graduate Fellows participate at the University in an academic course of study tailored to their individual needs, and they may choose to take courses to prepare for a PhD program. Additionally, all students work closely with the management staff in administration, business, education and visitor services, horticulture and maintenance at Longwood Gardens. This joint effort of the University and Longwood Gardens uniquely prepares students for professions in a wide variety of careers in public horticulture.

Students participate in symposium planning, a multi-week internship in an international region, professional outreach, as well as intensive visits to North American institutions with public horticulture emphasis. A generous stipend is an integral part of the Fellowship and all tuition is paid by the Program.

### Requirements For Admission

Applicants should demonstrate experience and interest in public horticulture and leadership potential. Applicants should submit a Graduate Record Examination combined score (verbal and quantitative) of at least 1050, an analytical writing score of at least 3, three letters of recommendation, and one official transcript of the undergraduate record. Admission is selective and competitive. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. Applicants must apply on-line via the UD Graduate School, which can be accessed from the Program's website.

### Financial Aid

All students admitted to the Program are awarded a Longwood Fellowship that provides a stipend and tuition scholarship for two years.

### Requirements For The Degree

The following is required for the Master of Science degree in Public Horticulture

PLSC 637	Collections Management and Curation	3
PLSC 832	Botanic Garden Management, Section 11	3
PLSC 864	Seminar Planning and Development	1+1
PLSC 868	Research	4
PLSC 869	Master's Thesis	2
MSST 802	Leadership and Management of Museums	3
MSST 804	Museum Internship	3
	Research Methodology or Statistics Course	3
	Another Museum Studies Course	3
	Management and Leadership Courses	12
	<b>Total Credits</b>	<b>38</b>

Longwood Fellows may, with the assistance of their research committee, choose other course credits from disciplines that will support the research area.

The Program begins July 1. Fellows participate directly in staff rotations associated with the daily operations of Longwood Gardens during the first summer. Academic study begins at the University with the opening of the fall term.

## College of Arts and Sciences

### College of Arts and Sciences

The College of Arts and Sciences offers a number of Master's and PhD degree programs administered by the department with which they are affiliated. Virtually all faculty members in the college are qualified to supervise graduate-level programs. More details about these faculty and the degrees they hold may be found on the faculty listing website for individual departments.

#### Fine Arts (MFA)

Telephone: (302) 831-2244

<http://www.udel.edu/art/>

Faculty Listing: [http://www.udel.edu/art/favc\\_faculty/index.htm](http://www.udel.edu/art/favc_faculty/index.htm)

#### Program Overview

To make important art is an automatically expansive process. It is a momentum and an action, disregarding traditional boundaries in favor of ideas and actualizations. The Department of Art at the University of Delaware realizes that the contemporary artist benefits from a thorough investigation of their own practice as well as wide-ranging feedback from others, and we strive to create an environment that encourages these conditions. Our program is divided among research, practice, and discourse.

Students are asked to take academic classes to encourage them to develop a language with which to discuss what they are doing; they are asked to keep up a dedicated studio practice where they are pushed to fully engage their interests; and they come together with this language and studio work for regularly scheduled critiques. The M.F.A. program hosts a diverse faculty capable of responding to a range of work in a variety of conditions, and we foster a communal teaching model where students will dialogue with professionals and other graduate students outside of their perceived "field." Our curriculum allows for both radical experimentation and a devoted effort to a unique vision.

We work to develop thoughtful, articulate artists through an M.F.A. program housed within a diverse University. We consider the University setting to be an ideal territory for the development of intellectually strong and challenging works of art, and we encourage our students to take advantage of the broad range

of ideas being discussed outside of the arts. At the same time, the intimate size of our program allows for the graduate faculty to engage with students on an individual level, and to nourish work that comes out of a personal vision rather than any overarching philosophy of what art should be.

#### Requirements For Admission

Applicants should send the completed application, transcripts, and application fee, resume, personal statement, and three letters of recommendation to the Office of Graduate and Professional Education. Applicants will find information for presenting 15-20 examples of their recent work on the department website. The department's application deadline is February 15, with decisions regarding admission generally made by March 15. See Graduate Admissions for further information.

#### Financial Aid

Please refer to Graduate Fellowships and Assistantships for further information.

#### Requirements For The Degrees

A minimum of 60 credits, a public exhibition and a supporting paper are required for the MFA degree. The 60 graduate credit hours required for the MFA degree are distributed in the following manner:

REQUIREMENTS	
CREDIT HOURS	
Graduate Studio	33
Graduate Critique	12
Critical Issues Seminar	3
Research Seminar	3
Non-art Academic	3
MFA Supporting Paper and Exhibition	6
TOTAL	60

Graduate faculty reviews with each student are held at the end of each semester (15, 30, and 45 hour reviews). Students must pass these reviews to continue in the program. Students who do not pass the review are generally placed on probation for one semester or in some cases asked to leave the program. Once a student is placed on probation, they have one semester to improve their performance or they will be asked to leave the program.

In some instances, the Department's Graduate Admissions Committee may establish additional

requirements to be met by the individual student.

## **Art Conservation (MS)**

Telephone: (302) 831-3489 <http://www.artcons.udel.edu/>

Faculty Listing: <http://www.artcons.udel.edu/faculty>

The department of Art Conversation offers the Master of Science in Art Conversation and the Preservation Studies PhD.

The Winterthur/University Of Delaware MS Program In Art Conservation

### Program Overview

The program offers a three-year interdisciplinary curriculum leading to a degree of Master of Science in Art Conservation. The program was established in the spring of 1974 as a cooperative effort between Winterthur and the University. The program is designed to educate and train conservation professionals who can carry out the examination, stabilization and treatment of art and artifacts, are versed in general principles of collection care, and have a broad academic background in science and the humanities to assure enlightened decision making. The following subjects are to be studied: materials science, history of art, archaeology, art and artifact technology, craft skills, cultural context, preventive maintenance, art care treatment techniques and conservation history, ethics and philosophy. Major conservation specialty areas include: textiles, wood, paper, photographs, library materials, paintings, painted and decorative surfaces, natural science collections, and anthropological, historical, decorative and art objects of all materials.

### Requirements For Admission

Only applicants who are accepted as Fellows in Conservation are admitted to the program. Positions will be awarded to college graduates who have completed coursework in art history, archaeology, studio art and chemistry, and the minimum of 400 hours of pre-program experience in conservation, and who can demonstrate academic and independent work in manual and studio skills. Applicants who wish to major in Furniture Conservation must also demonstrate a solid competency in traditional woodcraft as related to conservation treatment and assessment. Specific course requirements are available online at

<http://www.artcons.udel.edu/academic/masters/application>

Applications to the program must be filed by January 15. Applicants are expected to obtain a GRE score of 1050 or better (verbal plus quantitative). Admission is selective and competitive based on the number of well qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission.

### Financial Aid

The fellowships are awarded annually. A full grant covers tuition for each semester and carries an annual stipend. Funding for professional development and research travel is also available by application.

### Requirements For The MS Degree

Courses carrying an ARTC designation are generally open only to art conservation graduate students. (Permission of instructor is required for other students.) There is no thesis or language requirement in the program. A research/technical study paper is done in the second year. Comprehensive examinations are given at the end of the first and second years, and a portfolio of third-year work and a final oral presentation and oral examination are required before graduation. Two 8-week summer work projects are part of the required curriculum.

Students are permitted one 3-credit elective per semester for the first two years of study (a total of 12 elective credits within the 68 credits required for graduation). Elective course work should focus on the following topics: (1) history of the technology of cultural property; (2) connoisseurship and provenance studies; (3) reconstruction studies in studio arts and crafts; (4) museum studies. Elective courses may include course offerings in Art Conservation and other relevant departments/programs including Art History, Anthropology, Art, Museum Studies and the Winterthur Program in American Material Culture or courses offered via cooperative agreements arranged by the Art Conservation Department or other University departments with other higher education institutions. Independent study topics may be negotiated between faculty and students. Independent study topics may not duplicate the content of existing University of Delaware courses. A total of six credits of independent study may be permitted during the first two years of study.

## First-Year Academic Program

### Summer

Orientation to museum collections, conservation photography, examination techniques, preventive conservation, and microscopy.

### Fall Semester

ARTC 615 Properties and Structure of Art Materials I 3

ARTC 654 Examination and Treatment of Art Objects I 3

ARTC 670 Chemical and Physical Techniques Used in the Examination of Art Materials I 3  
One elective course. Elective courses include course offerings in Art Conservation or in other relevant departments/programs.

### Spring Semester

ARTC 616 Conservation Research Methods 3

ARTC 655 Examination and Treatment of Art Objects II 3

ARTC 671 Chemical and Physical Techniques Used in the Examination of Art Materials II 3  
One elective course. Elective courses include course offerings in Art Conservation or in other relevant departments/programs.

Comprehensive examination.

## Second-Year Academic Program

### Summer

Summer Work Project - 8 weeks

### Fall Semester

ARTC 650 Seminar in Art Conservation 1

ARTC 658 Topics in Advanced Apprenticeship and Research in Art Conservation I 6

ARTC 672 Chemical and Physical Techniques Used in the Examination of Art Materials III 3

One elective course. Elective courses include course offerings in Art Conservation or in other relevant departments/programs.

### Spring Semester

ARTC 650 Seminar in Art Conservation 1

ARTC 659 Topics in Advanced Apprenticeship and Research in Art Conservation II 6

ARTC 673 Chemical and Physical Techniques Used in the Examination of Art Materials IV 3

One elective course. Elective courses include course offerings in Art Conservation or in other relevant departments/programs.

Qualifying examination.

## Third-Year Academic Program

### Summer

Summer Work Project - 8 weeks

### Fall Semester

ARTC 870 Internship in Conservation 9

### Spring Semester

ARTC 870 Internship in Conservation 9

Final portfolio, oral presentation and oral examination.

## Preservation Studies (PhD)

Telephone: (302) 831-3489

<http://artcons.udel.edu/doctorate>

Faculty Listing: <http://www.udel.edu/materialculture/faculty/faculty.html>

Contact PSP Director, Joyce Hill Stoner  
[jhstoner@udel.edu](mailto:jhstoner@udel.edu) for additional information.

### Program Overview

The Preservation Studies PhD in the department of Art Conservation is an interdisciplinary doctoral course of study that teaches the philosophies, research methodologies, and policies informing preservation efforts focused on art, architecture, landscapes, and material culture. It is distinct from other discipline-based courses of graduate study in that it provides a mechanism to combine cross-field expertise toward doctoral study in preservation. The Preservation Studies Program prepares students to address questions regarding individual objects and works of art, collections, buildings and structures, and sites and landscapes. More specifically, it trains its PhD candidates to 1) assess the significance and cultural contexts for the production, function, reception, and preservation of all aspects of visual and material culture; 2) identify, evaluate, and implement preservation practice and policy; and 3) integrate ideas and methods from the full range of preservation-related disciplines.

The Preservation Studies doctoral program builds on unique and distinguished programs at the University of Delaware. The Preservation Studies Program may involve collaboration with faculty and physical resources in the Colleges of Arts and Sciences, Agriculture, Engineering, Human Services, Education, and Public Policy, Marine and Earth Studies, and the Winterthur Museum. Applicants apply to a specific area of concentration within Preservation Studies, and

acceptance is contingent upon compatibility with existing University of Delaware resources.

### Requirements for Admission

Successful applicants to the Preservation Studies Program must hold a Master's Degree in a discipline relevant to one of the program concentrations. All college and university transcripts should be submitted to the Office of Graduate and Professional Education; these must come directly from the institution. The application must also include the following: a paragraph summary of intended dissertation research and the relation of this topic to existing UD expertise and resources and a personal statement discussing areas of interest, intellectual goals, and how this program would be seen to meet these goals. Applicants must demonstrate prior background work that will enable them to successfully complete graduate-level courses and conduct graduate-level research on the proposed dissertation topic. A professional and academic résumé is required as is a writing sample to help the admissions committee assess the applicant's ability to design and conduct a research project and to communicate findings to the scholarly community. Graduate Record Examination scores are required. Applicants for whom English is not a native language should submit TOEFL scores in order to demonstrate satisfactory proficiency in the English language. A score of 550 or higher is required for paper-based TOEFL exams; 213 or higher is required for computer-based TOEFL exams. Applications must include three letters of recommendation that speak to the applicant's ability to conduct research in the chosen area of concentration. The deadline for submission of an official application form to the Office of Graduate and Professional Education is February 1. The committee may request additional materials. An on-campus interview is strongly encouraged.

The Preservation Studies Program will convene a committee of at least three faculty members in the chosen area of expertise to process and consider the application after all materials listed above are received. Admission to the program will be selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities for each concentration and dissertation topic area. Applicants who meet stated minimum requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from

admission if they offer other appropriate strengths.

### Financial Aid

Funding is competitive and may take the form of fellowships, teaching assistantships, and research assistantships. Please refer to Graduate Fellowships and Assistantships for further information.

### Requirements for the Degrees

Upon their acceptance into the Program, students will meet with their advisors to formalize their curricula. They will choose approved courses relevant to their area of concentration and projected course of study. Areas of concentration include: Historic Preservation Planning (including Structures, Landscape, and Preservation of Social and Cultural Context), Preservation Technologies, Conservation Research and Technical Studies, and Heritage Management. Each student's curriculum must include a balance of courses that provide an introduction to the wide range of theoretical and methodological issues as well as courses supporting individual preservation research endeavors. Theoretical and methodological breadth ensures that all students in Preservation Studies are familiar with basic procedures of research design and data handling and analysis needed to conduct dissertation research. Eighteen credits of coursework are required. A non-credit seminar for presentation of research in progress will also be required for three semesters (PRES 801). Three courses will be required as approved by the advisor, selected in consultation with the student. There will be three electives. Once advanced to candidacy, students must register for at least 9 credits of PhD dissertation credit (PRES 969). (A total of 27 course credits.) Proficiency in one or more foreign languages may be required for certain areas of concentration and/or dissertation topics and will be determined by the chair of the dissertation committee. Likewise, proficiency in certain practical laboratory techniques may be necessary for certain concentrations.

After 18 credits of course work have been graded, the student must pass a written qualifying examination in the areas of concentration, supervised by senior faculty from the appropriate departments. The scope and content of the examination will be determined by the dissertation committee chair in consultation with members of the committee and/or professors of courses the student has

completed for the concentration requirement. The qualifying examination must be passed before the student proceeds to candidacy. One semester after passing the qualifying examination, the student must submit a formal dissertation proposal (of about 10-15 pages) to his or her dissertation committee. The completed dissertation is expected to reflect the results of original and high quality research of significance to preservation studies, written in a scholarly and literary manner worthy of publication. The student will conduct an oral defense of the dissertation to all members of the dissertation committee.

### **Art History (MA, PhD)**

Telephone: (302) 831-8415; Fax: (302) 831-8243

<http://www.udel.edu/ArtHistory>

Faculty Listing: <http://www.udel.edu/ArtHistory/faculty/>

#### Program Overview

The department offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. The department offers studies in the history of art from ancient to modern times, with special concentrations in American art and in European art from the Renaissance through the modern eras. Cooperative arrangements with Bryn Mawr College and the University of Pennsylvania permit students to take courses at both institutions. Other arrangements with various institutions enable students to work with original objects and documents and to arrange, under faculty and museum staff supervision, exhibitions on a variety of subjects. The University Gallery, located on the campus, has a collection of about 6,000 objects for teaching and student research as well as providing opportunities for organization of exhibitions. The collections of Gertrude Käsebier photographs and Abraham Walkowitz paintings and drawings, e.g., are the largest in existence. The University Gallery has received the Paul R. Jones Collection of African American Art, the Frederick and Lucy S. Herman Native American Art Collection, and the Mabel and Harley McKeague Alaskan Inuit Collection. Periodically, art history graduate seminars have contributed to the research for, and organization of, exhibitions at such museums as the Metropolitan Museum of Art, the Whitney Museum of American Art, the Hirshhorn Museum and Sculpture Garden, the Delaware Art Museum, and the Pennsylvania Academy of the Fine Arts, as well as the University Gallery.

Resources of the department include an extensive image collection, the Decimal Index of the Art of the Netherlands, the "Illustrated Bartsch," and the Wayne Andrews photographic archive of American architecture, a cumulative index of dissertations and theses in American art. The University Library includes the Esther I. Schwartz Collection in the American Decorative Arts and special collections of books on museology and the conservation of works of art, as well as the George MA Hanfmann Professional Library of Ancient Art, the E.P. Richardson Library, and the Lloyd and Edith Havens Goodrich-Albert Pinkham Ryder Archive. There is also a collection of books and ephemera on Italian Futurism.

Another university resource is the Center for Historic Architecture and Design (CHAD), a multidisciplinary research and public service group exploring the evolution of historic architecture, engineering, and the built environment. Based in the College of Arts & Sciences, CHAD is cosponsored by the departments of Art History, History, and Geography, the College of Engineering, and the Museum Studies Program, and the Winterthur Program in Early American Culture. CHAD is the first American university center in this field recognized by the Department of the Interior. Graduate students in art history may pursue a graduate specialization both in architectural history and in historic preservation and may qualify for CHAD grants, internships, and research assistantships.

The Department of Art History enjoys a longstanding relationship with the Center for Material Culture Studies, a dynamic collaboration of individuals, programs, and departments engaged in the documentation, interpretation, and preservation of the objects and images that have shaped American life. The Center builds on our collective national reputations and extraordinary strengths in well-established academic, research, and public service programs in the fields of material culture, historic preservation, museum studies, and historical archaeology. The Center for Material Culture Studies capitalizes on institutional partnerships with the Winterthur and Hagley museums, Historical Society of Delaware, and Delaware Division of Historical and Cultural Affairs. The Center offers competitive graduate student research assistantships, new and developing courses in design history and visual culture, and an exciting teaching and learning environment for faculty, staff, and students. The Center's programs reach into its University

constituencies ranging from the humanities to the performing and studio arts, and reaching out to larger public and scholarly communities.

The Winterthur Museum Library, open to graduate students in art history, is especially strong in American art and in Western European art and design, a special strength in the Department of Art History. It also contains the Waldron Phoenix Belknap, Jr., Research Library of American Painting and the Joseph Downs Manuscript Collection.

The nearby Delaware Art Museum includes a comprehensive collection of American paintings, sculpture, and prints from about 1800 to the present day, the Samuel and Mary R. Bancroft English Pre-Raphaelite Collection, the John Sloan Collection, the Howard Pyle Collection, and the N.C. Wyeth papers.

#### Requirements for Admission

Graduates of the program have entered careers in college and university teaching, museum curatorship and administration, national and state arts agencies, architectural preservation and historic sites, librarianship, and research. Although it is desirable for candidates to have majored in the history of art, well-qualified applicants from other fields will be considered. Applicants are required to take the Aptitude Test of the Graduate Record Examination.

Applications for admission in the fall semester must be in the Office of Graduate and Professional Education by January 1. Applicants may request assistantships as part of the online application. See Graduate Admissions for further information.

Students are admitted to the graduate program in Art History on the basis of consideration of a combination of all of the following materials: a writing sample; a personal statement; letters of recommendation; undergraduate and, if relevant, graduate records; and Graduate Record Examination (GRE) scores. Normally, for admission the minimum combined score for the verbal and quantitative portions of the GRE is 1050, and the minimum undergraduate grade point average (GPA) is 3.00. However, achievement of that minimum score and GPA does not by any means guarantee admission, as the majority of admitted students have considerably higher scores and averages. On the other hand, under special or unusual circumstances, other strengths may obviate

the need to meet one or both of those stated minima.

#### Financial Aid

Please refer to Graduate Fellowships and Assistantships for further information.

#### Requirements for the Degrees

Requirements for the M.A. degree in Art History consist of 27 credits of course work plus 3 Master's Paper credits, satisfactory completion of the foreign language requirement (one language), and satisfactory completion of the Master's Paper. All students will be required to take 27 credit hours, of which at least 21 hours must be Art History graduate courses. With prior permission from the Director of Graduate Studies, students may substitute one or more courses in such related fields as Anthropology, Early American Culture, Historic Preservation, History, Museum Studies, and Philosophy. The degree requirements should be completed within two years of full-time study.

For students seeking a Ph.D. in art history, the department offers two routes to degree completion. One is designed for students who hold an M.A. in art history or its equivalent. The other, the Direct Ph.D. Program, is designed for students who hold a Bachelor's Degree in art history, or a related field, and are seeking a Ph.D. in art history. Students admitted to the Direct Ph.D. Program have the option of stepping out of the program at the M.A. degree.

Requirements for students in the Direct Ph.D. program consist of a minimum of 36 credits of graduate course work and satisfactory completion of the language requirement (2 languages), the M.A. Paper, and major and minor Ph. D. field exams. At least 30 of the course credits are to be in Art History seminar courses and the other 6 to be selected from additional seminars, graduate lecture courses, or independent study courses, or a combination of these. In addition to the 36 credits of graduate course work, 3 credits of ARTH 870 Master's Paper and 9 Dissertation Credits are required. Candidates then produce a dissertation, which is defended in an oral examination.

Requirements for the Ph.D. for students holding an M.A. include a minimum of 24 credits of graduate course work beyond the M.A. and satisfactory completion of the language requirement (2 languages) and major and minor Ph.D. field exams. At least 18 of the

course credits are to be in Art History seminar courses and the other 6 to be selected from additional seminars, graduate lecture courses, or independent study courses, or a combination of these. In addition to the 24 credits of graduate course work, 9 dissertation Credits are required. Candidates then produce a dissertation, which is defended in an oral examination.

## **CURATORIAL TRACK PHD PROGRAM IN ART HISTORY**

The Curatorial Track PhD program (CTPhD) is intended to prepare graduate students in Art History for curatorial careers in specialized art historical fields. The program is open to students who have been accepted into the department's doctoral program. Its nature is twofold: 1) a scholarly component will provide students with a thorough and intensive specialized training in graduate-level art historical studies; 2) a practical, interdisciplinary component will involve coursework in such related fields as art conservation, technical art history, preservation and material culture studies; curatorial and museum studies; and business and non-profit management. This second component also comprises a minimum of two internships in art museums, including our program's partners: the Philadelphia Museum of Art, The Pennsylvania Academy of Fine Arts, the Delaware Art Museum, and the Walters Art Museum, among others.

### **Requirements for the CTPhD:**

Students with a BA entering the Art History Direct PhD program and electing to take the Curatorial Track will follow all the rules and regulations ([www.udel.edu/ArtHistory/graduate/gradrevision.html](http://www.udel.edu/ArtHistory/graduate/gradrevision.html)) of the Art History Direct PhD except as follows:

The credit minimums and distribution for CTPhD students will be: 8 courses (24 credits) in Art History graduate courses, following the same breadth requirements, etc., as the regular Art History Direct PhD and 6 courses (18 credits) in CTPhD Program Courses (see below for specific distribution requirements);

The total minimum courses/credits for CT students in the Direct PhD Program will therefore be 14 courses (42 credits), plus 3 Master's Paper credits (ARTH870), plus 9 Dissertation credits (ARTH969) = 54 credits.

Students with an MA entering the CTPhD follow all the rules and regulations of the Art History

PhD program, except as follows:

The credit minimums and distribution for CTPhD students will be: 6 courses (18 credits) in Art History graduate courses, following the same breadth requirements, etc., as the regular Art History PhD program and 6 courses (18 credits) in CTPhD Program Courses (see below for specific distribution requirements);

The total minimum courses/credits for CT students entering the program with an MA will therefore be 12 courses (36 credits), plus 9 Dissertation credits (ARTH969) = 45 credits.

### **Area Requirements**

A minimum of 6 graduate courses (18 credits), one in each of the following six areas:

Art Conservation, Technical Art History, Preservation Studies and Material Culture Studies, Techniques and Materials - Courses that fulfill this requirement will focus on such topics as: techniques and materials of paintings; examination and treatment of art objects; conservation ethics and research methods.

Curatorial Studies, Museum Studies, Exhibition Courses - Courses that fulfill this requirement will focus on such topics as: collections management; museum education; exhibition design and organization; public engagement. Newly designed courses could address issues of collecting, researching and display in museums specializing in ethnicity-related artworks, including, on the University of Delaware campus, the Paul R. Jones Collection of African American Art.

Non-Profit Management, Organizations, Human Resources, Administration, Accounting, or a course in a similar area with advisor's approval - Courses that fulfill this requirement will focus on such topics as: understanding people in organizations; or ethical issues in the business environment.

Elective - One course in any area with the approval of the advisor and the Director of Graduate Studies.

Internship A (ARTH 664, max. 6 credits) - One semester of curatorial internship in area museums (a 2-month or longer summer internship will be deemed to count as a semester). Internship B (ARTH 664, max. 6 credits) A second semester of curatorial internship, either in the same museum as the first or in a different one (a 2-month or longer summer internship will be deemed to count as a semester).

## Doctoral Examination for the CTPHD

Major Field Exam will include a connoisseurship component, which, when feasible, will include original objects.

The Minor Field exam is not required.

## Relation To The MA In American Material Culture

At the University of Delaware, there are two avenues to the historical study of the visual arts: (1) The MA and PhD program in the Department of Art History; and (2) the MA in American Material Culture sponsored by the Winterthur Program, a multidisciplinary graduate course of study offered cooperatively by the University and the Henry Francis du Pont Winterthur Museum. Students interested primarily in studying American decorative arts in a material culture context should consider the Winterthur Program in American Material Culture described in this catalog. The Department of Art History is concerned with the fine arts (painting, sculpture, and architecture) and with the decorative arts in that context, with study of the decorative arts at the PhD level especially encouraged.

At the PhD level, the department offers specialization in the decorative arts through courses at Winterthur, and students may take their minor field examination and elect to write their dissertations in this area. These students have access to the collections and teaching staff at Winterthur. Master's theses may also be written on the subject.

## Biological Sciences (MS, PhD) (PhD/ MBA) (PSM/Certificate in Biotechnology)

Telephone: (302) 831-1841

<http://www.bio.udel.edu/>

Faculty Listing: <http://www.bio.udel.edu/people/faculty.php>

### Program Overview

The Department of Biological Sciences offers Master of Science and Doctor of Philosophy degrees in the fields of physiology; cancer biology, cardiovascular biology; cell and extracellular matrix biology; developmental biology; microbiology and virology; and molecular biology and genetics. Formalized concentrations (<http://www.udel.edu/bio/ed/grad/concentrations/>) have been established to provide students with customized research and career mentorship. Since many students

pursuing the PhD in Biological Sciences are interested in pursuing careers in industrial science, the Department of Biological Sciences and The Alfred Lerner College of Business and Economics has developed a jointly administered PhD in Biological Sciences/ MBA degree. Financial aid is available to all research MS and Ph.D. graduate students in the form of assistantships. The stipend level for 2011-2012 is \$22,000 per 12 months for MS and pre-candidacy PhD students, and \$23,000 per 12 months for post-candidacy PhD students. In addition, all graduate assistants in Biological Sciences receive a full tuition scholarship from the University of Delaware and university subsidized health insurance.

The Department of Biological Sciences also offers the Professional Science Masters (PSM) in Biotechnology (<http://www.udel.edu/professional/biotech/>) degree as well as a Graduate Certificate in Biotechnology. The PSM in Biotechnology combines coursework in the core life science disciplines, coursework in other scientific disciplines relevant to biotechnology, 15 credits of business coursework from the Alfred Lerner College of Business and Economics and a six-month long industrial internship to give students real world experience in biotechnology. Both the PSM and Certificate can be pursued part-time and are an ideal choice for those working in industry who want to expand their training while continuing to work.

### Research Facilities

The Department of Biological Sciences occupies Wolf Hall and the McKinly Laboratory building and has modern well-equipped laboratories for research and teaching. The buildings are adjacent and located on the "Green" on the main campus. Other research opportunities are available at the Delaware Biotechnology Institute and with jointly appointed faculty mentors working in other UD departments. Translational Research opportunities exist at the A.I. Dupont Hospital for Children and the Christiana Care Health System as part of the Human Health Initiative and the Center for Translational Cancer Research. Extensive core facilities support departmental research efforts and include a modern laboratory animal facility, atomic force microscopy, confocal and electron microscopy, histology, DNA sequencing, gene array analysis, proteomics, and whole animal imaging.

### Requirements for Admission

Graduate admission criteria of the Department include a recommended minimum scholastic

index (grade point average on a 4.0 point scale) of 3.0 overall and 3.0 in the sciences. The Graduate Record Examination (GRE) General test (Verbal and Quantitative) is required. Competitive scores are approximately 550 (Verbal), and 650 (Quantitative).

Admission to graduate programs in Biological Sciences requires demonstrated academic excellence and the following (or the equivalent): two years of biological sciences; one semester of mathematics, preferably calculus or statistics; one year of college physics; one year of inorganic (general) chemistry; and one course in organic chemistry. Any deficiency in undergraduate training must be made up (without graduate credit) during the first year of graduate study.

All applications must be made electronically to the University's Office of Graduate and Professional Education. Applications must include three letters of recommendation (sent directly to the University of Delaware Office of Graduate and Professional Education or uploaded on the web based application) from persons able to judge the applicant's ability to pursue graduate study, a CV, personal statement and transcripts. Applications for the MS and Ph.D. degrees are normally considered only for fall entrance, but applicants who are U.S. citizens or permanent residents may request permission to enroll during the spring or summer semester. For the MS and Ph.D. degrees, application materials must be complete by October 1 in order to be considered for spring admission. International applicants for the MS and Ph.D. degrees are considered only for fall admission. Complete applications received by January 15 have optimal consideration for fall admission and financial aid; April 15 is the final Departmental deadline. In exceptional circumstances, we can consider late applications from U.S. citizens until June 15. Applications for the PSM and Certificate in Biotechnology are routinely considered for both Fall and Spring admission. Applications for fall received by February 1st will receive optimal consideration, but applications will be accepted until July 1st. Applications for spring received by October 1st will receive optimal consideration, but applications will be accepted until December 1st.

Applicants who are not U.S. citizens must complete the Test of English as a Foreign Language (TOEFL) with a score of 600 or higher on the paper-based test, or 250 or higher on the computer-based test, or 100 or higher on the IBT in accordance with University of

Delaware regulations for graduate assistantship eligibility. These tests, as well as the GRE, are administered through the Educational Testing Service. Previous education, training or residence in the U.S. does not exempt foreign nationals from these requirements. Requests for a waiver of the language test requirements (for example, for students from English-speaking countries outside of the U.S.) must be approved by the University of Delaware Office of Graduate and Professional Education. Foreign applicants needing further language training prior to matriculation into graduate study are encouraged to apply through the UD English Language Institute's conditional admission program (see [http://www.udel.edu/eli/programs\\_cap\\_list.html](http://www.udel.edu/eli/programs_cap_list.html))

Admission to the graduate program in Biological Sciences is competitive. Those who meet the stated minimum requirements are not guaranteed admission, nor are those who fail to meet all those requirements necessarily precluded from admission if they offer other appropriate strengths.

#### Requirements for the Degrees

<http://www.bio.udel.edu/ed/graduate/>

The research based Master of Science program requires a minimum of 30 credits that include 16 hours of graduate courses, 6 hours of thesis and successful completion of the preliminary examination. Primary emphasis is on research that culminates in a written thesis and the oral defense of that thesis.

For the PhD degree, 16 hours of graduate courses, successful completion of the preliminary and qualifying examinations and the defense of a written research proposal and dissertation are required. Two semesters of experience in the teaching of undergraduates is required of all doctoral candidates. The preliminary examination is administered after two semesters of study are completed and is designed to identify the student's strengths and weaknesses and suitability for further graduate study. The doctoral qualifying examination is an in-depth examination of the student's research specialty and is administered after six semesters of enrollment. It is expected that a significant portion of the dissertation will be suitable for publication.

The PSM in Biotechnology requires 12 credits of life sciences coursework, 9 credits of applied biotechnology coursework, 15 credits of "PLUS" curriculum focused on business and ethics

and 6 credits of an industrial internship for a minimum of 42 credits. (see <http://www.udel.edu/professional/biotech/>)

The Certificate in Biotechnology requires 9 credits of life sciences coursework and 6 credits of applied biotechnology coursework. (see <http://www.udel.edu/professional/biotech/certificate/index.html>)

#### Dual Degree PhD In Biological Sciences and Master of Business Administration

<http://www.bio.udel.edu/ed/graduate/dual-degree-phd-biological-sciences-and-mba.php>

Students desiring to pursue the joint PhD in Biological Sciences/MBA initially apply directly to the PhD program of the Department of Biological Sciences and must meet the admissions requirements of the PhD program. The student matriculates into the PhD program, must successfully complete all first-year course work, choose a dissertation advisor, pass the preliminary examination and form the dissertation advisory committee as required for the PhD program. During the summer between the first and second year in the PhD program, the student must convene their advisory committee and petition them for permission to take 6 credits of tier-one MBA coursework in addition to their PhD coursework requirements during the second year. Since PhD students are supported on assistantships based in the Department of Biological Sciences and receive tuition scholarships for these assistantships, continued enrollment in any MBA classes is dependent on maintained satisfactory progress towards the PhD

Once the student has successfully completed all required course work for the PhD degree and has completed 6 credits of MBA coursework, students interested in the joint PhD/MBA program must convene their PhD advisory committee and petition for permission to apply to the joint PhD/MBA program. If this petition is granted, the student's progress towards the PhD is reviewed by the Graduate Affairs Committee (GAC) of the Department of Biological Sciences. If GAC finds that the student is in good standing in the department, the student then applies to the MBA program for admission into the joint PhD/MBA program.

#### **Chemistry and Biochemistry (MA, MS, PhD)**

Telephone: (302) 831-1247

<http://www.udel.edu/chem/>  
Faculty Listing: <http://www.udel.edu/chem/faculty.html>

#### Program Overview

The Department of Chemistry and Biochemistry offers programs leading to the PhD, MS, and MA degrees. Financial support for PhD students is available in the form of teaching assistantships, research assistantships, and fellowships. The thesis for the Master of Science degree or the doctoral dissertation may be in analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, or physical chemistry. Certain courses offered in other departments may be taken for credit for advanced degrees in chemistry if these fit logically into the proposed course of study and have the approval of the candidate's advisor.

Four major state-of-the-art facilities support the research of faculty and students. These laboratories are operated by PhD-level scientists who provide analytical service and training courses. The Blue Hen NMR Complex houses eight liquid- and solid-state FT-NMR spectrometers and one FT-ESR spectrometer. Graduate students routinely use these instruments in their research. The departmental mass spectrometry laboratory encompasses instruments that provide service in electrospray ionization (ESI), matrix-assisted laser desorption ionization (MALDI), fast-atom bombardment (FAB), chemical ionization (CI), and electron ionization (EI) mass spectrometry. GC/MS, LC/MS, and MALDI instruments are available for routine student use. The X-ray laboratory includes a state-of-the-art diffractometer for small molecule crystallography. Our department also houses the university-wide Surface Analysis Facility, which provides analytical capabilities in scanning probe microscopy (SPM), including scanning tunneling microscopy (STM) and atomic force microscopy (AFM), Auger electron spectroscopy (AES), X-ray photoelectron spectroscopy (XPS or ESCA) and time-of-flight secondary ion mass spectrometry (TOF-SIMS).

A research facility to perform macromolecular crystallography is also housed in the department. A wide variety of equipment is available in individual research laboratories. The department maintains electronics, machine, and glass-blowing shops as well as a chemistry reference library. Further information regarding research areas and resources can be found at the departmental web site <http://www.udel.edu/chem/>

## Requirements For Admission

Admission to the graduate program in the Chemistry and Biochemistry Department is evaluated on the basis of the applicant's GRE scores and undergraduate records including the transcript and letters of recommendation. TSE and TOEFL scores are required for foreign applicants for whom English is not the first language. Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

## Requirements For The Degrees

### MA in the Department of Chemistry and Biochemistry

A minimum of 30 credit hours of graduate-level courses is required with an overall B average (3.00). A minimum of 18 credit hours must be course work at the 600 level or above (excluding pre-candidacy study, research, thesis or dissertation credits) as specified in the PhD requirements listed below. A maximum of 12 credit hours, 500 level or greater, may be taken in other departments toward the 30 credit hour requirement. No thesis is required. The MA degree requires successful completion of a series of cumulative examinations.

### MS in the Department of Chemistry and Biochemistry

A minimum of 30 credit hours of graduate-level courses is required with an overall B average (3.00). A minimum of 18 credit hours must be course work at the 600 level or above (excluding pre-candidacy study, research, thesis or dissertation credits) as specified in the PhD requirements listed below. A maximum of 12 credit hours, 500 level or greater, may be taken in other departments toward the 30 credit hour requirement.

First year-graduate students are required to take a non-credit one-hour special seminar, CHEM 865-010 (new student seminar) and CHEM 601, Introduction to Laboratory Instruction. Graduate students must also register for one of the topical seminar series (CHEM 865-XXX - Biochemistry Seminar, Organic/Inorganic Seminar, Physical/Analytical Seminar), as well as Colloquia (CHEM 865-XXX). A thesis is required. Thesis must not

represent more than six credit hours. Thesis and/or research must represent a minimum of 6 and a maximum of twelve credit hours toward the 30 credit hour requirement.

### PhD in the Department of Chemistry and Biochemistry

A minimum of 30 credit hours of graduate-level courses is required with an overall B average (3.00). The department course requirements are a minimum of eighteen credit hours in graduate level courses (600-level or higher) excluding research and dissertation (CHEM 868 and CHEM 969). At least nine of these must be taken outside the student's division. Specific course requirements for each division are listed below. Scientific courses offered by other Departments may be counted as courses outside the student's division, if approved by the faculty in the student's division. The student must achieve at least a cumulative grade point average of 3.00 in the courses that fulfill this requirement. The course requirements, including the division's requirements, should be satisfied within four semesters of entering the program with a bachelor's degree.

First year-graduate students are required to take a non-credit one-hour special seminar, CHEM 865-010 (new student seminar) and CHEM 601, Introduction to Laboratory Instruction. Graduate students must also register for one of the topical seminar series (CHEM 865-XXX - Biochemistry Seminar, Organic/Inorganic Seminar, Physical/Analytical Seminar), as well as Colloquia (CHEM 865-XXX). The PhD degree requires successful completion of a series of cumulative examinations. The PhD degree requires a thesis based on original research and a final public oral defense of the dissertation.

Analytical Chemistry: Six credit hours of graduate analytical courses plus three additional credit hours of graduate coursework designated by the research advisor. The three additional credit hours can be selected from graduate level analytical courses, other graduate level courses in the Chemistry and Biochemistry Department, or graduate level courses in other departments. Courses in other departments must be approved by the analytical faculty. Analytical courses which can satisfy this requirement include:

- CHEM 620 Analytical Spectroscopy
- CHEM 621 Chemical Separations
- CHEM 622 Electroanalytical Chemistry
- CHEM 623 Chemometrics
- CHEM 624 Principles of Mass Spectrometry

- CHEM 625 Chemical Ionization Mass Spectrometry
- CHEM 626 Instrumental Methods in Mass Spectrometry
- CHEM 627 Practical Mass Spectrometry
- CHEM 628 Chemical Sensors
- CHEM 629 Surface Chemistry and Analysis
- CHEM 820 Special topics in analytical chemistry (may be repeated for credit when topics vary)

Biochemistry: At least 6 credits in graduate-level biochemistry courses. The Biochemistry Division or the student's research advisor must approve the courses used to satisfy the departmental course requirement of 18 credits in graduate level courses.

- CHEM 641 Biochemistry
- CHEM 642 Biochemistry
- CHEM 643 Intermediary Metabolism
- CHEM 644 Mechanisms of Enzyme Catalysis
- CHEM 645 Protein Structure and Function
- CHEM 646 DNA-Protein Interactions
- CHEM 647 Biochemical Evolution
- CHEM 648 Membrane Biochemistry
- CHEM 684 Biochemistry of Nucleic Acids
- CHEM 686 Biophysical Chemistry

Inorganic Chemistry: Nine credit hours from the following courses:

- CHEM 651 Advanced Inorganic Chemistry I
- CHEM 652 Organometallic Chemistry
- CHEM 653 Bioinorganic Chemistry
- CHEM 654 Advanced Inorganic Chemistry II

Organic Chemistry:

- CHEM 633 Advanced Organic Chemistry: Physical
- CHEM 634 Advanced Organic Chemistry: Synthesis and Reactivity

Two additional courses (6 credit hrs) with a CHEM-63X or CHEM-83X designation (one of these courses may be audited)

It is strongly recommended that the courses taken outside of Organic Chemistry should be chosen from the following list:

- CHEM 641 Biochemistry
- CHEM 642 Biochemistry
- CHEM 651 Advanced Inorganic Chemistry I
- CHEM 652 Organometallic Chemistry
- CHEM 654 Advanced Inorganic Chemistry II

If a student wishes to take other courses than these outside of Organic Chemistry, then each of these courses must be approved: (a) at the Fall and Spring advisements for first-year graduate students by the representative from the Organic Chemistry Division on the Graduate Curriculum Committee and (b) at other times by the Organic Chemistry Faculty.

Language Requirement (Organic Chemistry only): Any modern foreign language is acceptable and proficiency may be established by any one of the following:

Two full years of college-level courses in one of the specified languages with an average grade of C or better. An equivalent undergraduate background may be accepted, upon request to GCC.

Submission of evidence of satisfactory performance (a score greater than 500 or one above the 50th percentile) on the ETS Graduate School Foreign Language Test for one of the specified languages. Students will make arrangements to take these examinations directly with ETS.

Satisfactory performance in a departmental reading examination in one of the specified languages. Responsibility for determining the frequency and content of these examinations, as well as their grading, will rest with the organic division and the examinations will be administered by the organic divisional secretary. The use of a dictionary will be permitted throughout each examination.

A student wishing to use options (a) or (b) should consult with the Executive Secretary of the Department of Chemistry and Biochemistry who will verify grades or test scores. A student wishing to use option (c) should consult with the secretary of the organic division who will arrange for an examination and communicate the result to the executive secretary of the Department of Chemistry and Biochemistry who will see that it is recorded in the student's file.

Physical Chemistry: A minimum of three courses from among the following:

- CHEM 671 Quantum Chemistry
- CHEM 672 Advanced Quantum Chemistry
- CHEM 674 Chemical Dynamics
- CHEM 677 Chemical Thermodynamics

One may substitute for one of these three courses from related three-credit courses outside physical chemistry upon the approval of the research advisor.

## Communication (MA)

Telephone: (302) 831-8041

Website: <http://www.udel.edu/communication>

Faculty listing: [http://www.udel.edu/communication/people\\_faculty.html](http://www.udel.edu/communication/people_faculty.html)

### Program Overview

The Department of Communication offers a Master of Arts degree in Communication. A graduate student may concentrate in any of the department's areas of emphasis or may select a more general program. In either case, the coursework and related elements of the program will provide the student with the necessary background to undertake the research required to complete a M.A. thesis or to pass the comprehensive examination for successful completion of the degree. The program is designed to produce competent consumers of empirical research and theory in preparation for PhD studies or for a career as a communication specialist if this is a terminal degree.

### Requirements for Admission

To be considered for admissions, all applicants are evaluated on the following criteria:

- Undergraduate academic work; both total GPA and major GPA are considered and a 3.0 in both categories is generally the accepted minimum;
- A minimum of between 500 and 600 on the verbal and quantitative portions of the GRE; Foreign student's TOEFL scores must be at least 650 for the paper based exam, 280 for the computer based exam, and 114 for the internet version;
- Three letters of recommendation; and A statement written by the applicant addressing his or her interest in seeking graduate education in communication. These data are carefully considered in relation to the strengths of the department to determine if it can give the applicant the graduate education desired.

Admission to the MA program in Communication is selective and competitive, based on the number of well-qualified applicants and the limits of available faculty and facilities. Applicants who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

### Financial Aid

A limited number of teaching assistantships (and

sometimes research assistantships) are available and are awarded competitively in the spring of each year. The application deadline for teaching or research assistantships in Communication is February 10th. Teaching Assistants are expected to attend a number of training sessions in the month prior to their enrollment. Those who fail to attend these sessions will forfeit their financial aid.

### Requirements for the Degree

Upon entering the program, students are given a temporary advisor. By the completion of nine hours of graduate work, students are expected to have chosen their major advisor with whom they can work closely. Students are expected to maintain a 3.0 or better GPA. A thesis or comprehensive exam is required of all MA candidates. There is an oral portion of the comprehensive examination as well as an oral examination of the MA thesis by the candidate's committee after each member of this committee has had time to review the project thoroughly.

### Requirements for a MA in Communication with a Thesis:

COMM 601	Epistemology and Theory in Communication	3
COMM 603	Communication Research Methods - Procedures	3
COMM 604	Communication Research Methods - Analysis	3
COMM 630	Interpersonal Communication Theory	3
COMM 670	Mass Communication Theory	3
COMM 869	Master's Thesis	6
	Three elective Courses include:	9

- One course must be taken in Communication
- Two courses (or six credits) may be taken outside the Communication Department in a related area, if approved by the graduate student's committee

### Requirements for a MA in Communication w/ Comprehensive Exams:

COMM 601	Epistemology and Theory in Communication	3
COMM 603	Communication Research Methods - Procedures	3
COMM 604	Communication Research Methods - Analysis	3
COMM 630	Interpersonal Communication Theory	3
COMM 670	Mass Communication Theory	3

Five elective courses include:

- Three course must be taken in Communication

- Two courses (or six credits) may be taken outside the Communication Department in a related area, if approved by the graduate student's committee

- Comprehensive Exams in three areas.

## **BIOINFORMATICS & COMPUTATIONAL BIOLOGY**

Telephone: (302) 831-0161

<http://bioinformatics.udel.edu/Education>

Faculty Listing: <http://bioinformatics.udel.edu/Education/faculty>

### **PROGRAM OVERVIEW**

Bioinformatics & Computational Biology is an emerging field where biological and computational disciplines converge. The field encompasses the development and application of computational tools and techniques for the collection, analysis, management, and visualization of biological data, as well as modeling and simulation methods for the study of biological systems. Essential to the 21st century life sciences research and key to our understanding of complex biological systems, Bioinformatics & Computational Biology is impacting the science and technology of fields ranging from agricultural, energy and environmental sciences to pharmaceutical and medical sciences.

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energy and environmental sciences to pharmaceutical and medical sciences.

The Graduate Certificate in Bioinformatics is administered through the Department of Computer & Information Sciences and coordinated by the Center for Bioinformatics & Computational Biology. The scientific curriculum is supported with the research strength, education resources and bioinformatics infrastructure from ten participating Departments across the Colleges of Arts & Sciences, Engineering, Agriculture & Natural Resources, and Earth, Ocean & Environment, as well as the Delaware Biotechnology Institute.

The Computational Sciences Concentration provides knowledge and experience in developing computational methods and bioinformatics tools and databases for modern biological studies, biotechnology or medicine. The Certificate will provide bioinformatics core competency as a stepping stone for a professional career.

### **REQUIREMENTS FOR ADMISSION**

Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

The following are the admission requirements to the Graduate Certificate in Bioinformatics:

- A bachelor's degree at an accredited four-year college or university with a minimum grade average of 3.0 on a 4.0 system;
- Applicants may have undergraduate degrees from biological, computational, or other disciplines. However, applicants are expected to have scholarly competence in mathematics, computer science and/or biology;
- The following GRE scores are competitive: Quantitative: 650, Verbal + Quantitative: 1200. No GRE subject test is required;
- International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not the first language. The University requires an official paper-based TOEFL score of at least 550, at least 213 on the computer-based TOEFL, or at least 79 on the Internet-based TOEFL. TOEFL scores more than two years old cannot be considered official;
- Three letters of recommendation are required. At least one letter must be from a professor;

other letters can be from employers or others who have had a supervisory relationship with the applicant and are able to assess the applicant's potential for success in graduate studies; and

- Applications must also include a resume outlining work and academic experience, as well as an application essay consisting of the answers to the following questions:

- What educational background and scientific research or employment experience prepare you
- What are your long-term professional objectives?
- What specific attributes of the bioinformatics program make you feel that this degree is appropriate to help you achieve your professional objectives?

## DEGREE REQUIREMENTS

The Graduate Certificate in Bioinformatics requires 15 credits in the Bioinformatics & Computational Biology Core courses to achieve core competency in Bioinformatics.

### BINF-CERT: COMPUTATIONAL SCIENCES CONCENTRATION

Credit Requirements:  
Bioinformatics & Computational Biology Core-  
Computational Science..... 15 Credits  
Total number of required credits: 15

Bioinformatics & Computational Biology Core-  
Computational Science (15 credits)  
(All coursework is worth 3 credits unless otherwise noted.)

Bioinformatics  
CISC636 Bioinformatics

Introduction to Discipline (select one)  
ELEG 671 Introduction to Biomedical  
Engineering  
BISC 602 Molecular Biology of Animal Cells  
BISC 612 Advanced Cell Biology  
BISC 654 Biochemical Genetics  
PLSC 636 Plant Genes and Genomes  
ANFS 670 Principles of Molecular Genetics  
MAST 616 Methods in Molecular Biology

Systems Biology  
MATH 660 Introduction to Systems Biology

Database  
CISC 637 Database Systems

Biostatistics (select one)

STAT 613 Multivariate Statistical Methods  
with Biology Applications

STAT 656 Biostatistics Graduate Certificate in  
Bioinformatics - Life Sciences  
Concentration

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### PROGRAM OVERVIEW

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The Life Sciences Concentration provides knowledge and experience in applying bioinformatics methods, tools and databases as an integral approach to life science research, modern biotechnology or medicine.

The Certificate will provide bioinformatics core competency as a stepping stone for a professional career.

## REQUIREMENTS FOR ADMISSION

Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

The following are the admission requirements to the Graduate Certificate in Bioinformatics:

- A bachelor's degree at an accredited four-year college or university with a minimum grade average of 3.0 on a 4.0 system;
- Applicants may have undergraduate degrees from biological, computational, or other disciplines. However, applicants are expected to have scholarly competence in mathematics, computer science and/or biology;
- The following GRE scores are competitive: Quantitative: 650, Verbal + Quantitative: 1200. No GRE subject test is required;
- International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not the first language. The University requires an official paper-based TOEFL score of at least 550, at least 213 on the computer-based TOEFL, or at least 79 on the Internet-based TOEFL. TOEFL scores more than two years old cannot be considered official;
- Three letters of recommendation are required. At least one letter must be from a professor; other letters can be from employers or others who have had a supervisory relationship with the applicant and are able to assess the applicant's potential for success in graduate studies; and
- Applications must also include a resume outlining work and academic experience, as well as an application essay consisting of the answers
- What educational background and scientific research or employment experience prepare you for this bioinformatics degree program?
- What are your long-term professional objectives?
- What specific attributes of the bioinformatics program make you feel that this degree is appropriate to help you achieve your professional objectives?

## DEGREE REQUIREMENTS

The Graduate Certificate in Bioinformatics requires 15 credits in the Bioinformatics & Computational Biology Core courses to achieve core competency in Bioinformatics.

## BINF-CERT: LIFE SCIENCES CONCENTRATION

Credit Requirements:

Bioinformatics & Computational Biology Core–  
Life Science (15 Credits)

Total number of required credits: 15

Bioinformatics & Computational Biology Core–  
Life Science (15 credits)

(All courses are worth 3 credits unless otherwise noted.)

Bioinformatics

ANFS 644 Bioinformatics

Introduction to Discipline

MAST 697 Bioinformatics Programming for  
Biologists

Systems Biology

MAST 698 Environmental and Systems  
Bioinformatics

Database

CISC 637 Database Systems

Biostatistics (select one)

STAT 613 Multivariate Statistical  
Methods with Biology  
Applications

STAT 656 Biostatistics Professional Science

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## PROGRAM OVERVIEW

Bioinformatics & Computational Biology is an emerging field where biological and computational disciplines converge. The field encompasses the development and application of computational tools and techniques for the collection, analysis, management, and visualization of biological data, as well as modeling and simulation methods for the study of biological systems. Essential to the 21st century life sciences research and key to our understanding of complex biological systems, Bioinformatics & Computational Biology is impacting the science and technology of fields ranging from agricultural, energy and environmental sciences to pharmaceutical and medical sciences.

The Professional Science Master's program in Bioinformatics is administered through the Department of Computer & Information Sciences and coordinated by the Center for Bioinformatics & Computational Biology. The scientific curriculum is supported with the research strength, education resources and bioinformatics infrastructure from ten participating Departments across the Colleges of Arts & Sciences, Engineering, Agriculture & Natural Resources, and Earth, Ocean & Environment, as well as the Delaware Biotechnology Institute.

The Computational Sciences Concentration provides knowledge and experience in developing computational methods and bioinformatics tools and databases for modern biological studies, biotechnology or medicine.

Graduates of the Professional Science Master's program will play a key role in multi- and interdisciplinary teams, bridging life sciences and computational sciences. The scientific curriculum, along with "Plus" component for professional skills and the immersive internship will prepare PSM graduates for a professional career in industry or government.

#### REQUIREMENTS FOR ADMISSION

Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

The following are the admission requirements to the Professional Science Master's program in Bioinformatics:

- A bachelor's degree at an accredited four-year college or university with a minimum grade average of 3.0 on a 4.0 system;
- Applicants may have undergraduate degrees from biological, computational, or other disciplines. However, applicants are expected to have scholarly competence in mathematics, computer science and/or biology;
- The following GRE scores are competitive: Quantitative: 650, Verbal + Quantitative: 1200. No GRE subject test is required;
- International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not the first language. The University requires an official paper-based TOEFL score of at least 550, at least 213 on the computer-based TOEFL, or at least 79

on the Internet-based TOEFL. TOEFL scores more than two years old cannot be considered official;

- Three letters of recommendation are required. At least one letter must be from a professor; other letters can be from employers or others who have had a supervisory relationship with the applicant and are able to assess the applicant's potential for success in graduate studies; and
- Applications must also include a resume outlining work and academic experience, as well as an application essay consisting of the answers to the following questions:

- What educational background and scientific research or employment experience prepare you for this bioinformatics degree program?
- What are your long-term professional objectives?
- What specific attributes of the bioinformatics program make you feel that this degree is appropriate to help you achieve your professional objectives?

#### DEGREE REQUIREMENTS

The Professional Science Master's program in Bioinformatics has the following curriculum requirements:

- Science Core in Bioinformatics & Computational Biology (15)
- Ethics Core (3)
- Science Electives in Bioinformatics & Computational Biology (6)
- Internship (6)
- Professional Science Master's Plus Courses (12)
  - Business/Industry Track (BI)
  - Government/Non-Profit Track (GN)

The Professional Science Master's in Bioinformatics requires 24 credits of graduate-level coursework, 6 credits of internship and 12 credits of PSM PLUS coursework, totaling 42 credits. The 24 credits of coursework must include 15 credits in the Bioinformatics & Computational Biology Core courses and 3 credits in the Ethics Core courses.

An Internship (BINF864) is required for the PSM degree. The internship will be in most cases completed at participating companies/institutions in the BINF-PSM program and be jointly supervised by the Faculty Advisor and a Co-Mentor in the hosting institution. Unless special permission is granted, students need to complete 12 credit hours prior to the start of their internship. The participating mentors will develop with the internship student specific

objectives to be met during the internship, and have the internship approved by the Director of the Master's BINF-PSM program prior to the start of the internship. A final written report and a poster presentation are required to complete the course.

The PSM degree requires at least 12 credits of PLUS coursework in addition to their science core. Whereas students in the PSM program may have professional goals that would lead them into business and industry or to government or non-profit employment, the University of Delaware offers two tracks for the PSM PLUS component. The University recommends the student follow one of the PLUS tracks below, however students may cross over tracks to fit their interest.

## COMPUTATIONAL SCIENCES CONCENTRATION

Credit Requirements:

- A. Bioinformatics & Computational Biology Core–Computational Sciences (15)
- B. Ethics Core (3)
- C. Electives–Computational Sciences (6)
- D. Internship (6)
- E. PSM Plus courses (12)

Total number of required credits: 42

A. Bioinformatics & Computational Biology Core–Computational Sciences (15)  
(All coursework is worth 3 credits unless otherwise stated.)

Bioinformatics

CISC636 Bioinformatics

Introduction to Discipline (select one)

ELEG 671 Introduction to Biomedical Engineering

BISC 602 Molecular Biology of Animal Cells

BISC 612 Advanced Cell Biology

BISC 654 Biochemical Genetics

PLSC 636 Plant Genes and Genomes

ANFS 670 Principles of Molecular Genetics

MAST 616 Methods in Molecular Biology

Systems Biology

MATH 660 Introduction to Systems Biology

Database

CISC 637 Database Systems

Biostatistics (select one)

STAT 613 Multivariate Statistical Methods with Biology Applications

STAT 656 Biostatistics

B. Ethics Core (3 credits)

Ethics (select one)

BIOL 631 Practice of Science

UAPP 648 Environmental Ethics

UAPP 650 Values Ethics and Leadership

BUAD 840 Ethical Issues in Global Business Environments

C. Electives–Computational Sciences (6 credits)

Electives (select two)

CISC 841 Algorithms in Bioinformatics

CISC 621 Algorithm Design and Analysis

CISC 640 Computer Graphics

CISC 642 Introduction to Computer Vision

CISC 650 Computer Networks

CISC 675 Object Oriented Software Engineering

CISC 681 Artificial Intelligence

CISC 683 Introduction to Data Mining

CISC 882 Natural Language Processing

CISC 886 Multi-Agent Systems

CISC 887 Internet Information Gathering

CISC 888 Machine Learning

MATH 607 Survey of Scientific Computing

MATH 611 Introduction to Numerical Analysis and Scientific Computing

STAT 670 Introduction to Statistical Analysis I

STAT 671 Introduction to Statistical Analysis II

STAT 608 Statistical Research Methods

STAT 615 Design and Analysis of Experiments

STAT 619 Time Series Analysis

STAT 621 Survival Analysis

STAT 674 Applied Data Base Management

ELEG 633 Image Processing

ELEG 652 Principles of Parallel Computer Architectures

ELEG 655 High-Performance Computing with Commodity Hardware

ELEG 679 Introduction to Medical Imaging Systems

ELEG 680 Immunology for Engineers

CHEG 620 Biochemical Engineering

CHEG 621 Metabolic Engineering

D. Internship (6 credits)

BINF 864 Internship (1-6)

E. PSM Plus courses (12 credits)

Business/Industry Track

Survey of Business

BUAD 500 Survey of Business

Leadership and Organization  
BUAD 870 Understanding People in Organizations

Project Management, Operations or Entrepreneurship (select one)  
BUAD 831 Operations Management and Management Science  
BUAD 835 Managing New Product Development Projects  
BUAD 871 Managing for Creativity and Innovation  
ENTR 860 High Technology Entrepreneurship  
MISY 840 Project Management and Costing Intellectual Property  
CHEG 595 Intellectual Property for Engineers and Scientists

Government/Non-Profit Track

Survey of Public Administration  
UAPP 803 Seminar in Public Administration

Leadership and Organization (select one)  
UAPP 835 Organization and Management in Public and Nonprofit Sectors  
UAPP 604 Leadership in Organizations

Managerial Decision Making or Financial Management (select one)  
UAPP 819 Management Decision Making in Public & Nonprofit Sectors  
UAPP 833 Financial Management in Public & Nonprofit Sectors  
UAPP 827 Program and Project Analysis  
UAPP 829 Taxation and Fiscal Policies

Legal and Regulatory Affairs  
UAPP 646 Administrative Law and Policy

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- International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not the first language. The University requires an official paper-based TOEFL score of at least 550, at least 213 on the computer-based TOEFL, or at least 79 on the Internet-based TOEFL. TOEFL scores more than two years old cannot be considered official;
- Three letters of recommendation are required. At least one letter must be from a professor; other letters can be from employers or others who have had a supervisory relationship with the applicant and are able to assess the applicant's potential for success in graduate studies; and
- Applications must also include a resume outlining work and academic experience, as well as an application essay consisting of the answers to the following questions:

- What educational background and scientific research or employment experience prepare you for this bioinformatics degree program?
- What are your long-term professional objectives?
- What specific attributes of the bioinformatics program make you feel that this degree is appropriate to help you achieve your professional objectives?

## DEGREE REQUIREMENTS

The Professional Science Master's program in Bioinformatics has the following curriculum requirements:

- Science Core in Bioinformatics & Computational Biology (15)
- Ethics Core (3)
- Science Electives in Bioinformatics & Computational Biology (6)
- Internship (6)
- Professional Science Master's Plus Courses (12)
  - Business/Industry Track (BI)
  - Government/Non-Profit Track (GN)

The Professional Science Master's in Bioinformatics requires 24 credits of graduate-level coursework, 6 credits of internship and 12 credits of PSM PLUS coursework, totaling 42 credits. The 24 credits of coursework must include 15 credits in the Bioinformatics & Computational Biology Core courses and 3 credits in the Ethics Core courses.

An Internship (BINF864) is required for the PSM degree. The internship will be in most cases

completed at participating companies/institutions in the BINF-PSM program and be jointly supervised by the Faculty Advisor and a Co-Mentor in the hosting institution. Unless special permission is granted, students need to complete 12 credit hours prior to the start of their internship. The participating mentors will develop with the internship student specific objectives to be met during the internship, and have the internship approved by the Director of the Master's BINF-PSM program prior to the start of the internship. A final written report and a poster presentation are required to complete the course.

The PSM degree requires at least 12 credits of PLUS coursework in addition to their science core. Whereas students in the PSM program may have professional goals that would lead them into business and industry or to government or non-profit employment, the University of Delaware offers two tracks for the PSM PLUS component. The University recommends the student follow one of the PLUS tracks below, however students may cross over tracks to fit their interest.

## LIFE SCIENCES CONCENTRATION

Credit Requirements:

- A. Bioinformatics & Computational Biology Core–Life Sciences (15)
- B. Ethics Core (3)
- C. Electives–Life Sciences (6)
- D. Internship (6)
- E. PSM Plus courses (12)

Total number of required credits: 42

- A. Bioinformatics & Computational Biology Core–Life Sciences (15)  
(All coursework is worth 3 credits unless otherwise noted.)

Bioinformatics  
ANFS 644 Bioinformatics

Introduction to Discipline  
MAST 697 Bioinformatics Programming for Biologists

Systems Biology  
MAST 698 Environmental and Systems Bioinformatics

Database  
CISC 637 Database Systems

Biostatistics (select one)

- STAT 613 Multivariate Statistical Methods  
with Biology Applications  
STAT 656 Biostatistics

B. Ethics Core (3)

Ethics (select one)

- BIOL 631 Practice of Science  
UAPP 648 Environmental Ethics  
UAPP 650 Values Ethics and Leadership  
BUAD 840 Ethical Issues in Global Business  
Environments

C. Electives–Life Sciences (6)

Electives (select two)

- BISC 600 Biotechnology and Molecular  
Medicine  
BISC 602 Molecular Biology of Animal Cells  
BISC 605 Advanced Mammalian Physiology  
BISC 612 Advanced Cell Biology  
BISC 615 Vertebrate Developmental Biology  
BISC 625 Cancer Biology  
BISC 641 Microbial Ecology  
BISC 645 Bacterial Evolution  
BISC 654 Biochemical Genetics  
BISC 656 Evolutionary Genetics  
BISC 665 Advanced Molecular Biology &  
Genetics  
BISC 671 Cellular and Molecular Immunology  
BISC 675 Cardiovascular Physiology  
BISC 679 Virology  
BISC 682 Bacterial Pathogens Molecular  
Mechanisms  
BISC 693 Human Genetics  
STAT 670 Introduction to Statistical Analysis I  
STAT 671 Introduction to Statistical Analysis II  
CHEM 624 Principles of Mass Spectrometry  
CHEM 641 Biochemistry  
CHEM 645 Protein Structure and Function  
CHEM 646 DNA-Protein Interactions  
CHEM 649 Molecular Biophysics  
ANFS 670 Principles of Molecular Genetics  
MAST 616 Methods in Molecular Biology  
MAST 618 Marine Microbial Ecology  
MAST 623 Physiology of Marine Organisms  
MAST 625 Microbial Physiology and Diversity  
MAST 634 Marine Molecular Sciences  
PLSC 636 Plant Genes and Genomes  
PLSC 644 Physiology of Plant Stress  
HESC 602 Data Analysis and Interpretation in  
Health Sciences  
HESC 654 Medical Physiology  
PHYT 606 Research  
PHYT 623 Clinical Neuroscience (4)  
PHYT 633 Applied Physiology II

D. Internship (6 credits)

- BINF 864 Internship (1-6)

E. PSM Plus courses (12 credits)

Business/Industry Track

Survey of Business

- BUAD 500 Survey of Business

Leadership and Organization

- BUAD 870 Understanding People in  
Organizations

Project Management, Operations or  
Entrepreneurship (select one)

- BUAD 831 Operations Management and  
Management Science  
BUAD 835 Managing New Product  
Development Projects  
BUAD 871 Managing for Creativity and  
Innovation  
ENTR 860 High Technology Entrepreneurship  
MISY 840 Project Management and Costing

Intellectual Property

- CHEG 595 Intellectual Property for Engineers  
and Scientists

Government/Non-Profit Track

Survey of Public Administration

- UAPP 803 Seminar in Public Administration

Leadership and Organization (select one)

- UAPP 835 Organization and Management in  
Public and Nonprofit Sectors  
UAPP 604 Leadership in Organizations

Managerial Decision Making or Financial  
Management (select one)

- UAPP 819 Management Decision Making in  
Public & Nonprofit Sectors  
UAPP 833 Financial Management in Public &  
Nonprofit Sectors  
UAPP 827 Program and Project Analysis  
UAPP 829 Taxation and Fiscal Policies

Legal and Regulatory Affairs

- UAPP 646 Administrative Law and Policy

**Master of Science in Bioinformatics &  
Computational Biology (BICB-MS)**

Telephone: (302) 831-0161

<http://bioinformatics.udel.edu/Education>

Faculty Listing: [http://bioinformatics.udel.edu/  
Education/faculty](http://bioinformatics.udel.edu/Education/faculty)

PROGRAM OVERVIEW

Bioinformatics & Computational Biology is an

emerging field where biological and computational disciplines converge. The field encompasses the development and application of computational tools and techniques for the collection, analysis, management, and visualization of biological data, as well as modeling and simulation methods for the study of biological systems. Essential to the 21st century life sciences research and key to our understanding of complex biological systems, Bioinformatics & Computational Biology is impacting the science and technology of fields ranging from agricultural, energy and environmental sciences to pharmaceutical and medical sciences.

The Master of Science in Bioinformatics & Computational Biology is administered through the Department of Computer & Information Sciences and coordinated by the Center for Bioinformatics & Computational Biology. The scientific curriculum is supported with the research strength, education resources and bioinformatics infrastructure from ten participating Departments across the Colleges of Arts & Sciences, Engineering, Agriculture & Natural Resources, and Earth, Ocean & Environment, as well as the Delaware Biotechnology Institute. The Computational Sciences Concentration provides knowledge and experience in developing computational methods and bioinformatics tools and databases for modern biological studies, biotechnology or medicine.

Graduates of the Master of Science program will play a key role in multi- and interdisciplinary teams, bridging life sciences and computational sciences. The thesis-based MS degree will prepare students for advanced research in bioinformatics and computational biology.

## REQUIREMENTS FOR ADMISSION

Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

The following are the admission requirements to the Master of Science program in Bioinformatics & Computational Biology:

- A bachelor's degree at an accredited four-year college or university with a minimum grade average of 3.0 on a 4.0 system;
- Applicants may have undergraduate degrees

from biological, computational, or other disciplines. However, applicants are expected to have scholarly competence in mathematics, computer science and/or biology;

- The following GRE scores are competitive: Quantitative: 650, Verbal + Quantitative: 1200. No GRE subject test is required;

- International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not the first language. The University requires an official paper-based TOEFL score of at least 550, at least 213 on the computer-based TOEFL, or at least 79 on the Internet-based TOEFL. TOEFL scores more than two years old cannot be considered official;
- Three letters of recommendation are required.

At least one letter must be from a professor; other letters can be from employers or others who have had a supervisory relationship with the applicant and are able to assess the applicant's potential for success in graduate studies; and

- Applications must also include a resume outlining work and academic experience, as well as an application essay consisting of the answers to the following questions:

- What educational background and scientific research or employment experience prepare you for this bioinformatics degree program?
- What are your long-term professional objectives?
- What specific attributes of the bioinformatics program make you feel that this degree is appropriate to help you achieve your professional objectives?

## DEGREE REQUIREMENTS

The Master of Science program in Bioinformatics & Computational Biology has the following curriculum requirements:

- Science Core in Bioinformatics & Computational Biology (15)
- Ethics Core (3)
- Science Electives in Bioinformatics & Computational Biology (6)
- Thesis (6)
- Seminar (3)

The Master of Sciences in Bioinformatics & Computational Biology requires 24 credits of graduate-level coursework, 6 credits of thesis and 3 credits of seminar, totaling 33 credits. The 24 credits of coursework must include 15 credits in the Bioinformatics & Computational Biology Core courses and 3 credits in the Ethics Core courses. Attendance in Seminar (BINF865) is

required for three semesters for all graduate students.

A Thesis (BINF869) is required for the MS degree. Unless special permission is granted, students need to complete 12 credit hours prior to the start of their thesis. Students, with the assistance of their Faculty Advisor, will prepare and present a research proposal to their Thesis Committee for review and approval of the proposed research project. Following completion of the research outlined in the proposal, the MS degree candidate will prepare a written thesis according to the guidelines set forth by the Office of Graduate and Professional Education. A thesis defense, preceded by a seminar, will be held. The student's Faculty Advisor and Thesis Committee will administer and evaluate the thesis defense.

#### COMPUTATIONAL SCIENCES CONCENTRATION

Credit Requirements:

A. Bioinformatics & Computational Biology

Core-Computational Science (15)

B. Ethics Core (3)

C. Electives-Computational Sciences (6)

D. Thesis (6)

E. Seminar (3)

Total number of required credits: 33

A. Bioinformatics & Computational Biology

Core-Computational Science (15 credits)

Bioinformatics

CISC636 Bioinformatics 3

I

Introduction to Discipline (select one)

ELEG 671 Introduction to Biomedical Engineering 3

BISC 602 Molecular Biology of Animal Cells 3

BISC 612 Advanced Cell Biology 3

BISC 654 Biochemical Genetics 3

PLSC 636 Plant Genes and Genomes 3

ANFS 670 Principles of Molecular Genetics 3

MAST 616 Methods in Molecular Biology 3

Systems Biology

MATH 660 Introduction to Systems Biology 3

Database

CISC 637 Database Systems 3

Biostatistics (select one)

STAT 613 Multivariate Statistical Methods with Biology Applications 3

STAT 656 Biostatistics 3

B. Ethics Core (3 credits)

Ethics (select one)

BIOL 631 Practice of Science 3

UAPP 648 Environmental Ethics 3

UAPP 650 Values Ethics and Leadership 3

BUAD 840 Ethical Issues in Global Business Environments 3

C. Electives-Computational Sciences (6 credits)

Electives (select two; all courses worth 3 credits)

CISC 841 Algorithms in Bioinformatics

CISC 621 Algorithm Design and Analysis

CISC 640 Computer Graphics

CISC 642 Introduction to Computer Vision

CISC 650 Computer Networks

CISC 675 Object Oriented Software Engineering

CISC 681 Artificial Intelligence

CISC 683 Introduction to Data Mining

CISC 882 Natural Language Processing

CISC 886 Multi-Agent Systems

CISC 887 Internet Information Gathering

CISC 888 Machine Learning

MATH 607 Survey of Scientific Computing

MATH 611 Introduction to Numerical Analysis and Scientific Computing

STAT 670 Introduction to Statistical Analysis I

STAT 671 Introduction to Statistical Analysis II

STAT 608 Statistical Research Methods

STAT 615 Design and Analysis of Experiments

STAT 619 Time Series Analysis

STAT 621 Survival Analysis

STAT 674 Applied Data Base Management

ELEG 633 Image Processing

ELEG 652 Principles of Parallel Computer Architectures

ELEG 655 High-Performance Computing with Commodity Hardware

ELEG 679 Introduction to Medical Imaging Systems

ELEG 680 Immunology for Engineers

CHEG 620 Biochemical Engineering

CHEG 621 Metabolic Engineering

D. Thesis (6 credits)

BINF 869 Master's Thesis (1-6)

E. Seminar in Bioinformatics & Computational

Biology (3 credits)

Seminar (3 Semesters)

BINF 865 Seminar (1)

#### English (MA, PhD)

Telephone: (302) 831-2363

[http://www.english.udel.edu/grad\\_program/](http://www.english.udel.edu/grad_program/)

Faculty Listing: [http://www.english.udel.edu/faculty\\_profiles.htm](http://www.english.udel.edu/faculty_profiles.htm)

## Program Overview

The Graduate Program in English offers a Master of Arts and a Doctor of Philosophy degree program. The program's main objective is to prepare students to be productive scholars and excellent teachers of English studies. To achieve this goal, we offer an ambitious range of courses in English, American and Anglophone literature, literacy theory, cultural studies, film studies, theatre history, rhetoric and composition, and the history of the English language. Students receive rigorous training in the methods of literary research and are encouraged to publish their work in scholarly and professional journals as part of their studies. Pedagogical training in the teaching of writing and literature, prepares students to teach a variety of courses. The department has a large number of full-time faculty, three of whom hold named chairs. Graduate students and faculty meet to share work outside the classroom in a rich array of student-faculty colloquia, scholarly lectures, and readings.

## Requirements For Admission

An applicant for the MA program is expected to have an undergraduate major in English consisting of approximately 30 credit hours in English and American literature above the freshman level. The average in this work should be at least A-/B+ (3.5 on a scale of 1 to 4). The applicant must take the Graduate Record Examinations and is expected to score at least 1100 in the combined Verbal and Analytical tests, and for PhD applicants at least 500 in the Advanced Test in English and American literature. Three letters of recommendation and a writing sample (a critical paper) are required.

Students with a B.A. who seek to enter the PhD program must first gain admission to the MA program. Students who distinguish themselves in the MA program may then apply to enter the PhD program.

Transfer students with MAs from other institutions may also apply for the PhD program. They are expected to have an academic index of at least 3.75 in their MA courses, a combined score of at least 1200 in the Verbal and Analytical tests, at least 600 in the GRE Advanced Test in literature, and excellent recommendations from their graduate professors. Their writing samples should evidence strong analytical abilities.

Students are admitted into the graduate program for the Fall semester only. For students applying

for funding as well as admission to the graduate program, all application materials must be postmarked by January 1. For those seeking admission without funding, all application materials must be postmarked by May 1.

Admission is selective and competitive based on the number of well qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other relevant strengths.

## Financial Aid

The Department of English funds approximately 40 students each year, reserving awards for first-year MA through third-year PhD students, contingent upon satisfactory progress. Funded students are granted one of the following awards: a fellowship; a teaching, research, editorial, or administrative assistantship; or a teaching assistantship in the University Writing Center. All students on stipend receive tuition scholarships and have the opportunity to purchase, at low cost, coverage under the University's Graduate Student Accident and Sickness Insurance Plan.

Teaching assistants in the classroom normally teach one section of freshman composition in one semester and two in the other semester. Experienced teaching assistants have opportunities to teach other composition and literature courses. Students who serve as research, editorial, or administrative assistants and those who teach in the Writing Center work 15-20 hours per week each semester.

## Requirements For The Degrees

The MA in English is granted when the following requirements have been met: (1) at least ten courses (30 credit hours), or eight courses (24 credit hours) plus thesis (ENGL 869, 6 credits); (2) demonstrated ability to work in a foreign language; and (3) successful completion of the MA Comprehensive Examination.

The PhD is granted when the following requirements have been met: (1) at least eight courses (24 credit hours) beyond those taken for the MA; (2) full-time study in two consecutive semesters; (3) demonstrated ability to work in a second foreign language or advanced ability in one foreign language; (4) passing the PhD Specialty Examination; (5) writing and

successfully defending the dissertation.

### **Fashion Studies (MS)(4+1 BS/MS)**

Marsha Dickson, PhD, Department Chair  
Belinda Orzada, PhD, Director of Graduate Studies

Telephone: (302) 831-8713

<http://www.udel.edu/fash/graduate/>

Faculty Listing: <http://www.udel.edu/fash/about/directory.html>

#### Program Overview

The Department of Fashion and Apparel Studies offers a Master of Science in Fashion and Apparel Studies. The program is designed to prepare students to be effective professionals in the global apparel industry. All students will complete design problem-solving and consumer behavior courses to bring an understanding of both to meet challenges in the global fashion industry. The growth and dominance of large multinational apparel brands and retailers has created a need for graduates who are globally oriented and innovative, with apparel product design expertise, consumer behavior expertise, strong research skills, an understanding of social responsibility and sustainability, and strong communication skills. Graduates will be eligible for key industry positions that create value for a firm by integrating knowledge about consumer research, product design, product merchandising, product sourcing, and product presentation. The program has an international focus and emphasizes understanding design, theory, and research as they relate to fashion phenomena. Concepts and practices from social responsibility and sustainability underlie the graduate program. The MS in Fashion and Apparel Studies is also designed to provide students interested in future doctoral work in fashion and apparel programs a strong foundation toward that goal.

#### **MS in Fashion and Apparel Studies**

##### Requirements For Admission

Admission to the program is selective and competitive based on the number of applicants and limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. Prospective full-time candidates are admitted for the fall semester only. Part-time candidates may begin

in the fall or spring semester. A few funded assistantships are available; applications received by February 1 will be considered for funding. Review of applicants begins on February 1.

Candidates for admission need not have majored in fashion related areas previously, but they will be expected to possess:

- Strong written and oral communication skills
- An understanding of computer systems and basic word processing and spreadsheet applications
- Knowledge of consumer behavior or social psychological aspects of clothing
- Knowledge of the global fashion industry
- Understanding of design and aesthetic concepts
- Applicants interested in a creative design focus should have had a minimum of one patternmaking course

Appropriate credit and non-credit courses are available at UD to students with deficiency in any of these areas.

Specific admission requirements are:

- A cumulative grade-point average (GPA) equivalent to at least 3.0 on a 4.0 scale in all prior undergraduate college-level course work.
- A GRE (Graduate Record Exam) score (taken within past 5 years), with a minimum combined verbal and quantitative score of 1050 and no less than 550 on the verbal GRE.
- Students whose first language is not English must take the Test of English as a Foreign Language (TOEFL) unless a prior degree was obtained from a U.S. institution. The minimum score for TOEFL should be 550 or higher (paper-based test) or 213 (computer-based test) or 79 on the Internet-based TOEFL to be considered for admission. TOEFL scores more than two years old cannot be validated or considered official.
- An interview with member(s) of the Fashion and Apparel Studies graduate faculty may be required.

See Graduate Admissions for additional information, particularly for application procedures and dates.

##### Requirements for the Degree

The master's program requires a minimum of 32 hours of graduate coursework, including 6 hours of thesis, 6 semester hours of research methods and statistics, 14 required hours of departmental

courses, and 6 elective hours of additional focus area courses in the department.

Master's students are required to take the following courses:

FASH 822	Global Fashion Consumer	3
FASH 825	Interdisciplinary Approaches to Creative Problem Solving	3
FASH 800	Research Analysis in Fashion Studies	3
FASH 689	Apparel Supply Chains & Social Responsibility	1

Social Responsibility and Sustainability Core  
Select three courses from:

FASH 689	Apparel Supply Chains & Social Responsibility	1
FASH 691	Socially Responsible Apparel: Global Policy	1
FASH 692	Sustaining Global Apparel Supply Chains	1
FASH 693	Culture & Work in the Apparel Industry	1
FASH 694	Apparel Consumers and Social Responsibility	1
FASH 695	Bringing Social Responsibility to Apparel Corporate Culture	1
FASH 696	Current Initiatives for Apparel Industry Labor Compliance	1
FASH 697	Worker-Centric Social Responsibility for Apparel Industry	1
FASH 698	Redesigning Green Apparel-Design, Sourcing, Packaging	1
FASH 699	Producing Environmentally Responsible Apparel	1

And all of the following:

FASH 665	Fashion Studies Seminar (taken twice, 1 hr each)	2
EDUC 665	Elementary Statistics (or equivalent)	3
	Research Methods (IFST 615, EDUC 607 or equivalent)	3
	Special Interest electives (600 or 800 level) - may be from inside or outside of the department	6
FASH 869	Thesis	6

TOTAL

324+1 bachelor of science in fashion merchandising - master of science in fashion and apparel studies

The 4+1 program allows Fashion Merchandising majors who desire more education than the undergraduate major can provide to complete the master's degree in Fashion and Apparel Studies in half the time. By accelerating attainment of a master's degree which includes writing a thesis, students are provided with

expanded opportunities for attaining effective written communication skills, to think critically to solve problems, to work independently, and an opportunity to gain research experience with faculty scholars. A Master of Science in Fashion and Apparel Studies may result in expanded opportunities for career growth in fashion, apparel, retail and related industries.

#### Requirements for Admission

The Bachelor of Science degree in Fashion Merchandising requires 124 credits. An additional 32 credits are required for the Master of Science in Fashion and Apparel Studies, including 6 hours of thesis research. Undergraduate courses taken in the junior and senior years are combined to waive up to 13 credits of bachelor degree course requirements. In the freshmen and sophomore years and first semester of the junior year, students follow the FM curriculum as outlined in the undergraduate catalog.

Students are admitted into the 4+1 program in the spring of the junior year. During the second semester of the junior year and the senior year a minimum of 13 graduate credits at the 600 and 800 levels will be completed. Upon completion of the 4-year undergraduate degree, students will immediately begin taking the remaining graduate credits over a 1-year period.

Specific admission requirements are:

- Students must be enrolled at the University of Delaware in the Department of Fashion and Apparel Studies pursuing an undergraduate major in Fashion Merchandising.
- A minimum of 60 undergraduate credits and a GPA equivalent to at least 3.2 on a 4.0 scale in all prior undergraduate college-level course work.
- Students must take the GRE; however, the GRE is waived if a student has a 3.5 GPA or higher.
- Primary criteria: Candidates for admission must submit 3 letters of recommendation and a personal statement describing interests, intellectual goals, and how this program would meet their goals and objectives. A resume and a writing sample (research paper) are required.
- Secondary criteria: In instances such as high applicant numbers, candidates for admission will be evaluated on additional criteria including determination by faculty of the students' clear promise, or demonstration of, research potential, as well as an Interview.
- Students are admitted with provisional status until completion of the senior year and 120 credits, whereupon they are granted regular

status as graduate students.

Admission to the 4+1 program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

Application deadlines. Review of applicants begins October 15th of the junior year and students are officially notified by November 1st. Students begin the 4+1 program in the spring of the junior year.

## CURRICULUM CREDITS

### UNIVERSITY REQUIREMENTS

ENGL 110 Critical Reading and Writing  
(minimum grade C-) 3

First Year Experience (FYE) See your advisor for a planning guide. 3

- University Breadth Requirements (minimum grade C-)
- Up to 3 credits from each of the University
- Breadth requirement 12
- categories may be used to simultaneously satisfy these College of Arts and Sciences Breadth requirements. See your advisor for a planning guide. 12

Discovery Learning Experience (DLE) See your advisor for a planning guide. 3

Multi-cultural Course See your advisor for a planning guide. 3

### COLLEGE REQUIREMENTS

Second Writing Course (minimum grade C-)  
This course must be taken after completion of 60 credit hours.

Appropriate writing courses are normally designated in the semester's Registration Booklet. (See list of courses approved for Arts and Sciences second writing requirement.) 3

MATH 114, MATH 115, or higher/equivalent  
(minimum grade C-) 3

Intermediate Level Foreign Language  
Completion of the intermediate level course (107 or 202) or higher or exemption 0-12

COLLEGE BREADTH REQUIREMENTS (minimum grade C-)

The College Breadth Requirements are in

addition to the University Breadth Requirement. A total of twenty-one credits from Groups A, B, C is required with a minimum of six credits in each group. The six credits from each group could be from the same area.

One course from each of these groups will satisfy University Breadth Requirements. A minimum grade of C- required in courses to count as University Breadth Requirements.  
Group A: Creative Arts and Humanities  
Three credits from approved A&S Group A list (3)  
FASH 133 Fashion Art Studio 3

Group B: History and Cultural Change  
Three credits from A&S Group B list 3  
Three credits of Costume History from FASH 213, FASH 214, or FASH 224 3

Group C: Social and Behavioral Science  
PSYC 100 Introduction to Psychology 3  
SOCL 201 Introduction to Sociology 3  
ECON 151 Introduction to Microeconomics 3

Group D: Mathematics, Natural Science, and Technology  
CHEM 101 General Chemistry 4  
CHEM 102 General Chemistry 4

### FASHION DEPARTMENT CORE REQUIREMENTS (minimum grade C-)

FASH 210 Seminar on Fashion and Sustainability 3  
FASH 215 Fundamentals of Textiles I 3  
FASH 218 Fashion Merchandising 3  
FASH 220 Fundamentals of Textiles II 3  
FASH 325 Multimedia Fashion Presentations 3  
FASH 665 Fashion Studies Seminar 1  
FASH 380 Product Development 3  
FASH 419 Social-Psychological Aspects of Clothing 3  
FASH 655 Textile & Apparel in the Global Economy 3  
COMM 212 Oral Communications in Business 3

### FASHION MERCHANDISING MAJOR (minimum grade C-)

FASH 355 International Fashion Consumers and Retailers 3  
FASH 418 Merchandise Planning 3  
FASH 420 Assortment Planning, Sourcing and Buying 3  
FASH 630 Apparel Brand Management & Marketing 3

Accounting course from: FASH 217, ACCT 207, or ACCT 200	3-4
MISY160 Business Computing: Tools and Concepts	3
ACCT 352 Law and Social Issues in Business	3
BUAD 301 Introduction to Marketing	3
BUAD 309 Management and Organizational Behavior	3
BUAD 471 Advertising Management	3
BUAD 474 Marketing Channels and Retailing	3
ECON 152 Introduction to Macroeconomics	3
Research course from: HDFS 615 or EDUC 607	3
FASH 800 Research Analysis in Fashion Studies	3
<b>TOTAL UNDERGRADUATE CREDITS</b>	<b>124</b>

**GRADUATE REQUIREMENTS CREDITS**

Master's students are required to take the following courses:

FASH 822 Global Fashion Consumer	3
FASH 825 Interdisciplinary Approaches to Creative Problem Solving	3
FASH 665 Fashion Studies Seminar	1
EDUC 665 Elementary Statistics (or equivalent)	3
FASH 869 Thesis	6
FASH 869 Apparel Supply Chains & Social Responsibility	1
	1

Social Responsibility and Sustainability Core 3  
Select three courses from:

FASH 689 Apparel Supply Chains and Social Responsibility	1
FASH 691 Socially Responsible Apparel: Global Policy	1
FASH 692 Sustaining Global Apparel Supply Chains	1
FASH 693 Culture and Work in the Apparel Industry	1
FASH 694 Apparel Consumers and Social Responsibility	1
FASH 695 Bringing Social Responsibility to Apparel Corporate Culture	1
FASH 696 Current Initiatives for Apparel Industry Labor Compliance	1
FASH 697 Worker-centric Social Responsibility for Apparel Industry	1
FASH 698 Redesigning Green Apparel: Design, Sourcing, & Packaging	1

FASH 699 Producing Environmentally Responsible Apparel 1

**TOTAL 4+1 CREDITS (143)**

**Foreign Languages and Literatures (MA)**

Telephone: (302) 831-2592

<http://www.udel.edu/fltl/main/GraduateInfo.html>

Faculty Listing: <http://www.udel.edu/fltl/main/FacultyInfo.html>

**Program Overview**

The department offers two Master of Arts programs, the MA in Foreign Languages and Literatures and the MA in Foreign Languages and Pedagogy. Graduate students in French, German, and Spanish have the opportunity to spend a semester or a year abroad in Caen, Bayreuth, or Granada.

**Application for Admission**

The Department of Foreign Languages and Literatures recognizes the University application deadlines of July 1 for the Fall semester and December 1 for the Spring semester. However, students are encouraged to apply much earlier. The Department observes a policy of rolling admissions. For funding, applications should be received by February 1, as the initial round of funding decisions will be made in mid-February. Students who miss the February 1 deadline may still be considered for any teaching assistantships or graduate scholarships not assigned in February.

**Financial Aid**

The Department of Foreign Languages and Literatures has two principal types of awards: graduate assistantships and tuition scholarships. Graduate assistants may be assigned to the classroom as teaching assistants, to the Media Center or to individual faculty to serve as research or writing assistants. In their first year, graduate students who teach are usually assigned as team-teachers of elementary or intermediate foreign language courses, working with experienced instructors.

**Study Abroad Opportunities**

Exchange programs with the Universities of Caen (France), Bayreuth (Germany), and Granada (Spain) offer graduate students an opportunity to spend a semester or a year abroad.

## MA in Foreign Languages and Literatures

This degree program offers students a choice of several options in the study of foreign languages and literatures: a single-major plan (30 credits), a major-minor plan (36 credits), and a double-major plan (42 credits). Major fields are French, German, and Spanish. Minor fields are French, German, Spanish, Latin, Italian, Russian, Applied Linguistics/Pedagogy, and related disciplines.

### Requirements for Admission

The requirements for admission are:

- B.A. or equivalent in the target language/literature, or in another appropriate discipline.
- Undergraduate Grade Point Average of 2.9 overall, and 3.25 in the proposed MA major subject.
- GRE General Test for all students. Applicants should also take the GRE analytical writing test. A minimum combined score of 1050 on the verbal and quantitative parts of the GRE is normally required. Low GRE scores may, however, be balanced by high grades and strong letters of recommendation.
- TOEFL for international students (paper-based: minimum of 550 minimum for admission, 600 for teaching assistantship; computer-based: minimum of 213 for admission, 250 for teaching assistantship; internet-based iBT: minimum of 79 for admission, 100 for teaching assistantship).
- Three letters of recommendation, preferably from professors who know you well and can comment on your academic performance in the target language, as well as on your current target language proficiency (if you are a non-native speaker of that language). If you have been away from the academic world for some years, a letter from an employer may be substituted for on academic letter.
- Applicants must submit a writing sample of at least 1000 words in the target language (this may be a paper written for an undergraduate class). In addition, candidates applying for a teaching assistantship may have a brief personal or telephone interview conducted in English and the target language.

Admission to the MA in Foreign Languages and Literatures is competitive. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet one or more requirements necessarily precluded from admission if they offer other appropriate strengths.

## Requirements for the Degree

Depending on the option chosen, between 30 and 42 credits are required, including at least 24 in the major languages and literatures.

Candidates must pass a written and oral comprehensive examination based on reading lists in the major literature.

### Foreign Languages and Pedagogy (MA)

Telephone: (302) 831-2592

<http://www.udel.edu/fllt/main/GraduateInfo.html>

Faculty Listing: <http://www.udel.edu/fllt/main/FacultyInfo.html>

### Program Overview

The department offers two Master of Arts programs, the MA in Foreign Languages and Literatures and the MA in Foreign Languages and Pedagogy. Graduate students in French, German, and Spanish have the opportunity to spend a semester or a year abroad in Caen, Bayreuth, or Granada.

### Application for Admission

The Department of Foreign Languages and Literatures recognizes the University application deadlines of July 1 for the Fall semester and December 1 for the Spring semester. However, students are encouraged to apply much earlier. The Department observes a policy of rolling admissions. For funding, applications should be received by February 1, as the initial round of funding decisions will be made in mid-February. Students who miss the February 1 deadline may still be considered for any teaching assistantships or graduate scholarships not assigned in February.

### Financial Aid

The Department of Foreign Languages and Literatures has two principal types of awards: graduate assistantships and tuition scholarships. Graduate assistants may be assigned to the classroom as teaching assistants, to the Media Center or to individual faculty to serve as research or writing assistants. In their first year, graduate students who teach are usually assigned as team-teachers of elementary or intermediate foreign language courses, working with experienced instructors.

### Study Abroad Opportunities

Exchange programs with the Universities of

Caen (France), Bayreuth (Germany), and Granada (Spain) offer graduate students an opportunity to spend a semester or a year abroad.

### MA in Foreign Languages and Pedagogy

This degree program permits students to complete all requirements for reciprocal certification, except for student teaching, in French, German or Spanish. It also allows in-service teachers to improve and perfect their language skills and to keep up-to-date with pedagogical advances. This degree program also offers students a choice of several options in the study of foreign languages and literatures and pedagogy: a single-major plan (30 credits), a major-minor plan (36 credits), and a double-major plan (42 credits). Major fields are French, German, and Spanish. Minor fields are French, German, Spanish, Latin, Italian, Russian, Applied Linguistics/Pedagogy, and related disciplines.

### Requirements for Admission

The requirements for admission are:

- B.A. or equivalent in the target language/literature, or in another appropriate discipline.
- Undergraduate Grade Point Average of 2.9 overall, and 3.25 in the proposed MA major subject.
- GRE General Test for all students. Applicants should also take the GRE analytical writing test. A minimum combined score of 1050 on the verbal and quantitative parts of the GRE is normally required. Low GRE scores may, however, be balanced by high grades and strong letters of recommendation.
- TOEFL for international students (paper-based: minimum of 550 minimum for admission, 600 for teaching assistantship; computer-based: minimum of 213 for admission, 250 for teaching assistantship; internet-based iBT: minimum of 79 for admission, 100 for teaching assistantship).
- Three letters of recommendation, preferably from professors who know you well and can comment on your academic performance in the target language, as well as on your current target language proficiency (if you are a non-native speaker of that language). If you have been away from the academic world for some years, a letter from an employer may be substituted for one academic letter.
- Applicants must submit a writing sample of at least 1000 words in the target language (this may be a paper written for an undergraduate class). In addition, candidates applying for a teaching assistantship may have a brief personal or telephone interview conducted in English and the target language.

Admission to the MA in Foreign Languages and Pedagogy is competitive. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet one or more requirements necessarily precluded from admission if they offer other appropriate strengths.

### Requirements for the Degree

Depending on the option chosen, between 30 and 42 credits are required, including at least 15 in the major languages and literatures and 9 in foreign language pedagogy. Course work for students planning to seek teacher certification as well as the degree consists of 33 credits, including 15 in the major language, 9 in foreign language pedagogy, and 9 in Education (EDUC 613, EDUC 614, EDUC 619); these students must also pass a teacher competency test as established by the University Council on Teacher Education and must student teach. Candidates must pass a written and oral comprehensive examination based on reading lists in the major literature and in foreign language pedagogy.

### History (MA, PhD)

Telephone: (302) 831-8226

<http://www.udel.edu/History/>

Faculty Listing: <http://www.udel.edu/History/faculty.html>

### Program Overview

The Department of History offers MA and PhD programs in American history, European history, and the history of industrialization. In conjunction with these, it provides an opportunity for students to earn a certificate in Museum Studies or to earn a Masters degree in history education. The Department offers more limited graduate study in Ancient, African, Asian, Latin American, and Middle Eastern history.

Graduates from its programs hold professional positions in government, schools, museums, and historical agencies, in addition to academic positions in colleges and universities.

### The University Of Delaware - Hagley Program

This program offers a core curriculum focused on the history of industrialization, with an emphasis on social, cultural, and comparative perspectives. Prospective students with interests in the history of technology, consumption, business and work may apply for fellowships for MA and PhD work. Students may also earn a

certificate from the University's Museum Studies Program.

### History Of American Civilization

The Department of History in cooperation with the Winterthur Museum and numerous departments across the campus, sponsors a PhD program in the History of American Civilization. Based on the multidisciplinary study of American social and cultural history, the Program is distinguished by its emphasis on American material culture.

### Museum Studies

An MA or PhD candidate from any of the History graduate programs may qualify for a certificate in Museum Studies upon satisfactory completion of the required twelve credits in the Museum Studies Program. The University of Delaware is a recognized leader in education for museum careers; its graduates now staff scores of museums and historical/archival agencies across the country.

### Access To Special Resources

Students who do not seek admission to the Hagley or American Civilization programs may still take the courses that these programs feature. All history programs are enriched by the University's affiliation with the Hagley and Winterthur museums and by the proximity of museums and archival collections nearby in the mid-Atlantic region.

Courses in historical editing, archaeology, archival management, and visual approaches to history are offered on a regular basis.

### Requirements For Admission

Programs at both the MA and PhD levels are offered. Master's Degree applicants should have a combined verbal and quantitative GRE score of at least 1050, an overall undergraduate average of 3.0, an undergraduate history average of 3.0, and must submit 3 letters of recommendation and a history seminar paper or its equivalent. PhD track applicants should have a combined GRE score of 1250, an overall undergraduate/graduate average of 3.0, an undergraduate/graduate history average of 3.5, and must submit 3 letters of recommendation and a history seminar paper or its equivalent. Applicants should note that the admissions committee will evaluate this writing sample closely and it should represent the applicant's

preparedness to do rigorous graduate work. Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated academic requirements are not guaranteed admission nor are those who fail to meet those requirements necessarily precluded from admission, if they offer other appropriate strengths. The History Department normally admits students to all History programs for the fall semester only. The deadline for application is January 15, but early application is strongly encouraged. Students considering graduate work in history should consult "Guidelines to Graduate Programs in History" at [www.udel.edu/History](http://www.udel.edu/History).

### Financial Aid

Teaching Assistantships, Stewart Fellowships, tuition scholarships, and University Fellowships are available to graduate students at the MA and PhD levels. Please refer to Graduate Fellowships and Assistantships for additional information.

### Requirements For The Degrees

Candidates for the MA degree are required to complete 30 hours of course work, of which 21 hours must be in history. The history credits must include one of the department's five basic historiography courses, 4 reading seminars, 2 research and writing seminars or 1 research and writing seminar and a 6-credit MA thesis.

The PhD degree recognizes the candidate's command of specific fields of history as well as the ability to conceive and execute a PhD dissertation. The following specific requirements must be met: completion of 30 credits of graduate work of which at least 24 must be in history; the history credits must include 2 of the Department's 5 basic historiography courses, 4 reading seminars, and 2 research and writing seminars; demonstration of reading competence in a foreign language (faculties in certain specialties require additional language or skill requirements); passage of written field exams; a defense of the dissertation prospectus within six months of passing exams, and a presentation of a dissertation-based research paper to a departmental assembly of faculty and graduate students within a year of passing exams. After the preceding requirements have been met, the candidate must finish a dissertation and defend it in an oral exam.

## **Liberal Studies (MA)**

Telephone: (302) 831-6075

<http://www.udel.edu/mals/>

Faculty Listing: <http://www.udel.edu/mals/prospective.html#2>

### Program Overview

Designed primarily for adult, vocationally established individuals, the Master of Arts in Liberal Studies (MALS) degree offers interdisciplinary graduate education centered in the humanities and social sciences. The program emphasizes the history of ideas and the connections between fields of learning, encouraging a multidisciplinary approach to knowledge.

### Requirements for Admission

Requirements for admission differ from the traditional graduate programs offered at the University. Candidates submit an official transcript of previous undergraduate and graduate studies, three supporting letters (not the form from the Graduate Studies Office) from individuals who can discuss the applicant's strengths and capabilities, and a short essay of approximately three pages describing the applicant's intellectual interests and how the applicant thinks these can be developed in the MALS program. After preliminary screening, promising applicants will be invited to an interview after which the final admission decision will be made.

Admission is selective and competitive based on the number of well qualified applicants and the limits of available faculty and facilities.

### Requirements for the Degree

Students working for the MALS degree must take a three-credit gateway experience and two interdisciplinary core courses. They also choose a series of interdisciplinary electives designed specifically for the program and complete either a master's thesis or a project. By advisement of the Director and with consent of the course instructor, MALS students may enroll in up to six credits of regular graduate offerings in the participating departments.

## **Linguistics and Cognitive Science (MA, PhD) (BS/MA option)**

Telephone: (302) 831-6806; Fax: (302) 831-6896

<http://www.ling.udel.edu/ling/>

Faculty Listing: <http://www.ling.udel.edu/ling/>

The Department of Linguistics offers programs leading to the MA degree in Linguistics and Cognitive Science and the PhD in Linguistics. In addition, the department offers the option of a combined BS/MA in Cognitive Science/ Linguistics and Cognitive Science (this is not an option for Speech Pathology). The MA in Linguistics and Cognitive Science is a flexible degree, allowing students to design programs of study in areas of theoretical linguistics, cognitive science, and applied linguistics (including teaching English as a second language). Areas for PhD specialization include theoretical linguistics (syntax, semantics, phonology, morphology), psycholinguistics (first and second language acquisition, language processing, neurolinguistics), endangered and under-described languages (linguistic field methods, language typology, language documentation), and applied linguistics.

### Requirements For Admission

Students with a BA/BS or MA/MS in linguistics or in an appropriate field may apply. (Students without a degree in linguistics proper may be asked to take additional courses to meet minimum training in linguistics.) Applicants are required to submit a completed application, a writing sample, three letters of recommendation, GRE scores (a minimum of 1050 on verbal and quantitative combined is normally required; the analytical score is also considered), official transcripts of all previous work, and a personal statement describing interests and objectives. Foreign students whose language of education is not English must also submit TOEFL scores. A minimum of 100 on the computer-based/IBT TOEFL is normally required. Foreign students whose native language is not English and who are awarded a teaching assistantship must attend the ELITA training offered by UD before assuming their assistantship duties.

Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

### Financial Aid

Financial aid is available for PhD students only and takes the form of teaching assistantships, graduate assistantships and research assistantships. Conditions on funding are stated

in the Graduate Guidelines available from the department's Director of Graduate Studies and on the department website (<http://www.ling.udel.edu/ling/>).

### Requirements For The Master's Degree

For the MA degree, students must complete 30 credit hours planned in consultation with the student's advisor and the Director of Graduate Studies or the Cognitive Science Graduate Advisor. These credits must include at least 21 credit hours in cognitive science or linguistics courses and at least one 800-level seminar in cognitive science or linguistics. Full details of all programs are available from the department's Director of Graduate Studies or the Cognitive Science Graduate Advisor.

### Combined BS and MA Option

Qualified undergraduate students in the BS in Cognitive Science as well as students completing a Bachelors degree in related fields like Anthropology, Computer and Information Science, Philosophy and Psychology (and other fields by application) may apply for the Combined BS and MA option. Whereas the traditional programs for the BS and MA degrees involve 4 years of undergraduate work and 2 years of graduate work, the Combined BS and MA option enables students to earn both degrees in a 5-year period. Students who complete the Combined BS and MA program will graduate with both a Bachelor of Science degree in Cognitive Science and a Master of Arts degree in Linguistics and Cognitive Science. Students who are candidates for the Combined BS and MA option, and who complete the requirements for the BS but fail to complete the additional MA requirements, will receive the BS degree. This combined degree is not applicable for an MA in Speech Pathology.

#### a. Admission into the Combined BS and MA Program

Students may apply for admission to the Combined BS and MA program at the end of the sophomore year. The application process requires submission of a completed graduate application form for review by the Departmental Graduate Studies Committee. Initial admission will be based upon the student's ability to meet the following recommended entrance criteria:

- Combined mathematics and verbal SAT scores of at least 1200

- An undergraduate GPA of at least 3.25
- Completion of all core courses for the BS other than CGSC 485
- Submission of a writing sample, based on work completed in a Cognitive Science course

Admission is competitive so meeting the minimal requirements for admission does not guarantee admission nor does the failure to meet a requirement result in an automatic rejection. The GRE is not required for admission to the Combined BS and MA program by UD undergraduates.

#### b. Maintaining Status within the Program

Upon admission into the program and prior to the start of the junior year of study, the student will meet with his graduate advisor and submit a planned program of study, including all elective courses, to the Graduate Studies Committee. Planned programs of study are due by the end of fall semester of the student's junior year.

Continuation in the Combined BS and MA program is contingent upon maintaining a cumulative GPA of at least 3.25 in undergraduate courses with CGSC and LING designations and in graduate coursework. Satisfactory progress includes following the prescribed program of study.

Each student's progress and GPA will be evaluated at the end of each academic year by the student's advisor and the Graduate Studies Committee. Students who fail to meet the minimum GPA requirements or fail to show progress toward the degree will be dropped from the Combined BS and MA program. They may, however, continue in the undergraduate major unless their undergraduate progress is unsatisfactory according to the rules in effect for the BS program.

#### c. Degree Requirements for the Master of Arts in Linguistics and Cognitive Science and the BS in Cognitive Science

The graduate level course requirements for students in the Combined BS and MA option are the same as those for the MA in Linguistics and Cognitive Science. The course requirements for the degree include 30 credit hours planned in consultation with the student's advisor and the Director of Graduate Studies, which must include at least 21 credit hours in the Linguistics Department and at least one 800-level seminar.

The MA in Linguistics and Cognitive Science is a flexible program of study that provides training in both Linguistics and Cognitive Science. Separate tracks are provided for students whose emphasis is clearly in Cognitive Science or in Linguistics. In addition, students may propose a program of study that combines elements of the Linguistics and Cognitive Science tracks. See the Department's Graduate Policy Statement for additional information. Students in the Combined BS and MA option must fulfill all graduate and undergraduate course requirements for both the MA and their undergraduate degree.

#### d. Course Overlap

In the event that a student in the Combined BS and MA option completes a required graduate course as an undergraduate, and elects to count that course toward the bachelors degree, he will be required to substitute another graduate course, the choice requiring approval of the Director of Graduate Studies. When a student completes a 400-level undergraduate course that has content very similar to that of a parallel 600-level graduate course, he must petition the Director of Graduate Studies to substitute another graduate course for the 600-level course in question.

#### e. Revisions to Planned Program of Study in Combined BS and MA Option

Students who wish to make changes to their program of study must first obtain permission from their advisor. The advisor must then make a written request to the Graduate Studies Committee to revise the program of study.

#### Requirements For The PhD Degree

Students are required to take 60 credits beyond the BA/BS: 51 credits in courses proper and 9 dissertation credits. Students entering with a credited MA/MS in an appropriate area as determined by the department must take 30 credits: 21 in courses proper and 9 in dissertation. All transfer credit must be in accord with the rules of the Graduate Office; approval of transferred courses is at the discretion of the Committee on Graduate Studies of the Department of Linguistics. Students must take LING 607 Phonology I, LING 609 Syntax I, LING 608 Phonology II, LING 610 Syntax II, CGSC 696 Psycholinguistics, and at least three 800-level seminars. No course can satisfy two requirements except that the three 800-level seminars can count toward specialization

requirements; transfer credit for these requirements may be accepted, but only under the conditions stated above. It is suggested that the remainder of the course work have an appropriate balance of work in the subfields of linguistics and, at the same time, be directed toward the major areas of research interest.

Students are required to take one major examination, the Qualifying Examination and to write one publishable research paper for admission to Doctoral Candidacy. After successful completion of all requirements, students are required to write a dissertation followed by an oral defense.

Students whose native language is English are required to demonstrate proficiency in a language other than English. The goal is for students to be able to function as a professional in the field of linguistics in general and in their chosen area of specialization. Proficiency may be either written or spoken. Students are responsible for presenting a rationale for the selection of a particular language and for requesting a speaking or reading proficiency test. Students whose native language is not English will be assumed to have proficiency in English and will have thereby satisfied the proficiency requirement.

The language requirements must be satisfied prior to acceptance of the Dissertation Prospectus. No language examinations taken at any other school will fulfill any language requirement.

#### Program In Cognitive Science

The program in Cognitive Science is administered by the Department of Linguistics and Cognitive Science. See MA information (above) regarding the MA in Linguistics and Cognitive Science. While there is no Doctoral degree in Cognitive Science, the PhD in Linguistics allows a secondary specialization in Cognitive Science, and advanced degrees in related disciplines (e.g., Psychology) also permit students to develop concentrations in the field. There are also regular graduate course offerings in Cognitive Science that allow individualized training in the field.

#### M.A. Certificate in Cognitive Science

Matriculated graduate students in doctoral or masters programs may apply for admission to the cognitive science certificate program. Applications should be submitted to the steering

committee for the certificate program (via the chair of Linguistics and Cognitive Science).

Requirements are completion of 15 credits of graduate level courses selected from the list below.

Students will take 9-12 hours outside of their home department.

Student must, in consultation with his or her major advisor, submit a plan of study to the cognitive science certificate steering committee as early as possible. The student must have complete no more than six credits of course work towards the certificate when the plan of study is presented. The plan proposed must be accompanied by a cohesive rationale for the specific set of courses included in the plan. The plan must designate a member of the faculty from one of the relevant departments other than the student's home department as the certificate advisor, who must approve the plan of study. (Some grandfathering of current students will be possible as the new program takes effect.)

The cognitive science steering committee must review each student's accomplishments at or before the time the student receives the terminal degree in the home department and, if the student has fulfilled the requirements, approve the awarding of the certificate.

The courses below are those that qualify for the program. Additional courses may be added to the list or removed from the last during each academic year, with oversight of the steering committee.

List of qualifying courses for the Graduate Certificate in Cognitive Science (New courses may be proposed annually by the participating departments.):

#### Anthropology

ANTH 666 Independent Study

#### Computer and Information Systems

CISC 601 Elements of the Theory of Computation

CISC 681 Artificial Intelligence

CISC 886 Multi Agent Systems

#### Education

EDUC 802 Seminar in Reading

EDUC 807 Writing Processes in Educational Settings

EDUC 816 Literacy Problems

EDUC 817 Individual Intelligence Testing

EDUC 820 Contexts for Learning

EDUC 821 Cognition and Instruction

EDUC 823 Learning and Development

EDUC 833 Research and Theory of Mathematics Learning

EDUC 834 Research and Theory of Mathematics Teaching

EDUC 835 Research and Theory of Mathematics Curriculum

EDUC 848 Language Acquisition

EDUC 870 Child Neuropsychology

#### Linguistics and Cognitive Science

CGSC 604 Animal Minds

CGSC 610 Embodied Cognition

CGSC 611 Naturalized Semantics (pending)

CGSC 618 Meaning and Language Use

CGSC 620 Research Methods in Cognitive Science

CGSC 650 Recent Topics in the Philosophy of Mind

CGSC 651 Topics in Cognitive Science

CGSC 670 Elements of Cognitive Science

CGSC 671 Discovering Human Language: Introduction to Field Linguistics

CGSC 685 Seminar in Cognitive Science

CGSC 696 Psycholinguistics

CGSC 850 Topics in Experimental Methods

CGSC 890 Studies in Linguistics

LING 604 Structure of Language

LING 651 Logical Structures in Language

LING 691 Semantics

#### Physical Therapy

PHYT 623 Clinical Neuroscience

#### Philosophy

PHIL 866 Special Problems

#### Psychology

NSCI 629 Integrative Neuroscience

NSCI 631 Topics: Learning, Memory, and Brain; Developmental Behavioral Neuroscience; Seminar on Spatial Cognition; Stress and the Brain

PSYC 642 Mental Representation and Memory

PSYC 667 Topics: Seminar on Language and Cognition; Visual Cognition; Early Perceptual-Cognitive Development

PSYC 806 Social Cognition

PSYC 809 Research Design

PSYC 860 Psychological Statistics

PSYC 633 Cognitive Neuroscience (proposed)

### **Mathematical Sciences (MS, PhD) (4+1 BS/MS)**

Telephone: (302) 831-2346

<http://www.math.udel.edu>

Faculty Listing: <http://www.math.udel.edu/people/>

## Program Overview

The Department of Mathematical Sciences offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy in Applied Mathematics or Mathematics. The department also offers a 4+1 BS/MS program that allows students to complete both the Bachelor of Science degree in any undergraduate major administered by the department and the MS degree in a total of five years of full-time study.

Many of the major areas of mathematics are included among the research interests of the faculty of the department. There are numerous active seminars on these and other mathematical topics, as well as a steady stream of visiting scientists from all over the world.

The department is committed to providing individualized attention and guidance to every student in the program.

## Requirements for Admission

Admission to the graduate programs in Applied Mathematics and Mathematics is open to students who have completed the equivalent of a baccalaureate degree in mathematics or related fields, and have a sound preparation in linear algebra and advanced calculus. On a 4.0 system, applicants should have a GPA of at least 2.5 and an average of at least 3.0 in mathematics and related areas. Applicants who have completed an advanced degree must have done so with a GPA of at least 3.0. In addition, applicants must take the GRE Aptitude Test.

Students applying to the 4+1 BS/MS program must be in their junior year of study at the University of Delaware, enrolled in a Bachelor of Science degree program administered by the Department of Mathematical Sciences, must have a cumulative GPA of at least 3.2, a GPA of at least 3.4 in their major, and must have completed at least two mathematics courses at or above the 400 level. Two letters of recommendation and academic transcripts are required as part of the application process. The letters of recommendation must be from University of Delaware faculty.

## Financial Aid

Students holding assistantships are expected to perform satisfactorily in their assigned duties and to make good progress in their academic work. Renewal of financial aid is not automatic.

Due to the size of our program, we can only offer financial aid for up to 10 semesters for students entering with a Bachelor's degree; those entering with a Master's degree for up to 8 semesters. The department, however, will make every attempt to provide some form of funding for qualified students. First year teaching assistants are required to attend teaching workshops scheduled by the department.

For continued support beyond the 3rd year, a student entering with a Master's degree must pass the Candidacy Exam by the beginning of his/her 4th semester in order to be offered continued support beyond the 2nd year. For a student who does not pass the Candidacy Examination on the first try, there is no guarantee for support for the following academic year. However, a student may make a second and final attempt to pass the Candidacy Examination, and if the attempt is successful, the department will make every effort to secure funding for such a student.

## Requirements for the Master's Degree

To be eligible for the degree an M.S. candidate must complete 30 hours of course work beyond the Bachelor's degree. Students must maintain a GPA of 3.0 or better. These thirty hours of course work must be at or above the 600 level excluding Math 607. Students may take 3 credit hours worth of coursework outside of the department. Any additional course work taken for credit outside of the department requires approval of the Graduate Studies Committee.

Of the 30 credit hours required for an MS, at most 3 credits can be from a reading course unless an exception is granted by the Graduate Studies Committee.

The thesis option for the M.S. degree consists of 24 credit hours of course work plus 3 credit hours of research via Math 868 and 3 credit hours of thesis via Math 869, leading to a Master's Thesis. The purpose of this option is to assess the student's ability to conduct and report original research on a particular area within the field of specialization and/or synthesize and critically analyze important issues in the field of specialization. The particular form of the thesis project (e.g., report of original research or critical review of and exposition on the literature) will be determined by the student in consultation with his or her Thesis Advisor and the Thesis Committee. The Thesis Committee shall consist of three faculty; it is not required that a member of the committee be from outside mathematics.

After the topic(s) and project format have been determined, the student will have a maximum of one year to complete the written thesis (typically 50 to 60 pages). An oral defense will be scheduled following the Thesis Committee's evaluation of the thesis.

All requirements above must be fulfilled by any student enrolled in the 4+1 BS/MS program. However, a student may count up to six credit hours of graduate courses in the mathematical sciences earned while the student was an undergraduate toward the total unit requirement for the MS degree.

### Requirements For The PhD Degree

Students with no prior graduate course work must complete 48 credit hours of courses including:

- At least 27 credits of MATH courses at the 600 level or above, excluding MATH 607.
- A maximum of 27 credits of MATH courses at the 600 level.
- A maximum of 6 credits of MATH 868 (Research).
- A maximum of 6 credits at the 600 level or above in non-MATH courses, unless special permission is granted in advance by the Graduate Committee.

Candidates for the Ph.D. degree must also:

- Maintain a GPA of 3.0 or better.
- All Applied Mathematics and Mathematics students must complete the requirements for MS and pass the Preliminary Examination based on MATH 600, MATH 602, (Advanced Calculus) and MATH 672 (Linear Algebra) or MATH 612 (Numerical Linear Algebra). Students entering with Bachelor's degrees are required to pass the Preliminary Examination by the beginning of their 4th semester. Students entering with a Master's degree must complete this requirement by the end of the second semester of study. Students who do not meet this requirement are recommended for dismissal. Pass the oral Candidacy Examination.
- Select a Dissertation Committee, subject to the approval of the Graduate Committee.
- Complete two semesters of experience in teaching undergraduate students, or obtain a waiver from the Graduate Committee.
- Complete 9 credits of MATH 969 (Doctoral Dissertation) after admission to candidacy.
- Complete and successfully defend a

dissertation.

**Candidacy Exam:** A student entering with a Bachelor's degree must pass the oral Candidacy Exam by the beginning of their sixth semester of study. Students entering with a Master's degree must pass the Candidacy Examination by the beginning of their fourth semester of study. A second and final attempt is permitted. Dismissal will be recommended for a student who does not pass the Candidacy Exam on the second try.

In this examination a student must choose 2 topics from Algebra, Analysis, Applied Mathematics, Discrete Mathematics, Probability, and Numerical Analysis. The exams are based on MATH 650 and MATH 845 (Algebra), MATH 616, MATH 617 and MATH 810/MATH 835 (Applied Mathematics), MATH 688 and MATH 888 (Discrete Mathematics), MATH 613, MATH 612 and MATH 813/MATH 814 (Numerical Analysis), MATH 806 and MATH 836 (Functional Analysis and PDE) and MATH 630, MATH 631 and MATH 850 (Probability). Another subject area may be substituted for one of the above by petition to the graduate committee based on two graduate level courses and supported by a faculty member.

**Dissertation:** A student must successfully defend his/her dissertation in front of a committee consisting of the dissertation advisor and no less than three additional members, one of whom must be from outside the department. The dissertation must contain original publishable results. Music (MM)

### Music

Telephone: (302) 831-2577 <http://www.music.udel.edu>

Faculty Listing: <http://www.music.udel.edu/faculty/directory/>

### Program Overview

The Department of Music offers master's degree programs for students seeking advanced study in music. The degree Master of Music has two main purposes: (1) To provide instruction for gifted performers as they enter the professional world of orchestral, recital, and solo performance; or, (2) To enhance and upgrade the credentials and abilities of K-12 music educators, individuals preparing to enter doctoral-level programs in performance, and students intending to teach in postsecondary level institutions where the master's degree is required.

Students may choose between three concentrations: Performance (emphasizing studio instruction or conducting, and culminating in a public recital), Teaching (directed towards music educators in grades K-12 who desire a master's degree in this discipline), or Composition.

#### Research Facilities

Music study is enriched by the well-equipped and modern facilities in the Amy E. du Pont Music Building and the Center for the Arts. These provide ample rehearsal, practice, and performance spaces. An excellent collection of scores, books, and music journals is housed in the University's Morris Library. In addition, the department's Music Resources Center contains a fine collection of audio and video recordings. The building also houses extensive electronic equipment to support the work in computer technology which has earned the department international acclaim.

#### Requirements For Admission For The Master's Degree

The entering student is expected to have an undergraduate degree in music. The applicant must also submit a transcript of all previous academic work to the Office of Graduate and Professional Education, revealing an acceptable grade-point average (normally 3.0). The student must also submit a statement of professional goals and three letters of recommendation to the Office of Graduate and Professional Education. Students applying for admission to the Performance Concentration must pass an audition.

Applicants must perform satisfactorily on the department's music theory entrance exam prior to enrolling in MUSC 695 (Advanced Analytical Techniques). Applicants must also perform satisfactorily on the music history entrance exam in order to enroll in MUSC 611 (Studies in Music History). Students who fail either exam will be required to complete remedial coursework in that area.

Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

#### Financial Aid

Graduate assistantships are available to a select number of full-time students. The applicant should contact the department for information. Please refer to Graduate Fellowships and Assistantships for additional information.

#### Requirements For The Master's Degree

##### I. Performance Concentration: Instrumental (non-keyboard)

###### Courses:

Students are required to complete 35 credit hours (maintaining a cumulative grade point average of B or better) to be granted the degree Master of Music: Performance. All students take the following:

MUSC 601	Master's Recital	1
MUSC 603	Chamber Music Literature	3
MUSC 605	Symphonic Literature	3
MUSC 611	Studies in Music History	3
MUSC 620	Large Ensemble	4
MUSC 621	Chamber Ensemble	1
MUSC 622	Materials and Methods of Research	3
MUSC 661	Advanced Private Study	2
MUSC 662	Advanced Private Study	2
MUSC 663	Advanced Private Study	2
MUSC 664	Advanced Private Study	2
MUSC 681	Pedagogy and Literature	3
MUSC 695	Advanced Analytical Techniques Elective Music or Non-Music Elective	3

###### Other Requirements:

The culmination of the degree is a public recital (MUSC 601), which is preceded by an acceptable recital-approval hearing. In addition, toward the end of the course of study, the student must pass an oral examination.

##### II. Performance Concentration: Instrumental (keyboard)

###### Courses:

Students are required to complete 34 credit hours (maintaining a cumulative grade point average of B or better) to be granted the degree Master of Music: Performance. All students take the following:

MUSC 601	Master's Recital	1
MUSC 602	Advanced Keyboard Literature	3
MUSC 603	Chamber Music Literature	3
MUSC 611	Studies in Music History	3
MUSC 621	Chamber Ensemble	4
MUSC 622	Materials and Methods of Research	3
MUSC 661	Advanced Private Study	2
MUSC 662	Advanced Private Study	2

MUSC 663	Advanced Private Study	2
MUSC 664	Advanced Private Study	2
MUSC 681	Pedagogy and Literature	3
MUSC 695	Advanced Analytical Techniques	3
ELECTIVE	Music or Non-Music elective	3

Other Requirements:

The culmination of the degree is a public recital (MUSC 601), which is preceded by an acceptable recital-approval hearing. In addition, toward the end of the course of study, the student must pass an oral examination.

III. Performance Concentration (voice)

Courses:

Students are required to complete 32 credit hours (maintaining a cumulative grade point average of B or better) to be granted the degree Master of Music: Performance. All students take the following:

MUSC 601	Master's Recital	1
MUSC 608	Vocal Literature	3
MUSC 609	Choral Music Literature I	3
or		
MUSC 610	Choral Music Literature II	3
MUSC 611	Studies in Music History	3
MUSC 620	Large Ensemble	1
MUSC 621	Chamber Ensemble	1
MUSC 622	Materials and Methods of Research	3
MUSC 661	Advanced Private Study	2
MUSC 662	Advanced Private Study	2
MUSC 663	Advanced Private Study	2
MUSC 664	Advanced Private Study	2
MUSC 681	Pedagogy and Literature	3
MUSC 695	Advanced Analytical Techniques	3
ELECTIVE	Music or Non-Music elective	3

Other Requirements:

The culmination of the degree is a public recital (MUSC 601), which is preceded by an acceptable recital-approval hearing. In addition, toward the end of the course of study, the student must pass an oral examination.

IV. Performance Concentration (conducting)

Courses:

Students are required to complete 33 credit hours (maintaining a cumulative grade point average of B or better) to be granted the degree Master of Music: Performance. All students take the following:

MUSC 600	Master's Performance in Conducting	2
MUSC 603	Chamber Music Literature	3
MUSC 611	Studies in Music History	3

MUSC 620	Large Ensemble	1
MUSC 621	Chamber Ensemble	1
MUSC 622	Materials and Methods of Research	3
MUSC 661	Advanced Private Study	4
MUSC 662	Advanced Private Study	4
MUSC 695	Advanced Analytical Techniques	3
Elective	Music or Non-music elective	3

Students specializing in Instrumental Conducting:

MUSC 605	Symphonic Literature	3
MUSC 606	Wind Literature	3

Students specializing in Choral Conducting:

MUSC 609	Choral Music Literature I	3
MUSC 610	Choral Music Literature II	3

Other Requirements:

The culmination of the degree is a public recital (MUSC 600), which is preceded by an acceptable recital-approval hearing. In addition, toward the end of the course of study, the student must pass an oral examination.

V. Teaching Concentration

Courses:

Students are required to complete 30 credit hours (maintaining a cumulative grade point average of B or better) to be granted the degree Master of Music: Teaching. All students take the following:

Core Courses (9 cr.):

MUSC 611	Studies in Music History	3
MUSC 622	Materials and Methods of Research	3
MUSC 695	Advanced Analytical Techniques	3

Music Education Courses (6 cr.):

MUSC 640	Philosophical Issues in Music Education	3
MUSC 676	Seminar in Music Education	3

Specialization Component (3-4 cr.):

Students can elect one of three areas of specialization: Choral, Instrumental, or General Music K-12. The courses for each are as follows:

MUSC 636	Advanced Choral Conducting	3
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OR

Instrumental

MUSC 637	Advanced Instrumental Conducting	3
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OR

General Music K-12

MUSC 675 General Music K-12 3

Thesis or Project (6 cr.):

Students can elect to write a thesis or pursue a project in which they develop and implement a teaching portfolio. The courses for each are as follows:

Thesis

MUSC 869 Master's Thesis 6  
OR

Project

MUSC 679 Professional Development Project I 3

MUSC 680 Professional Development Project II 3

Elective Courses (6 cr.):

All elective courses must be approved by the Music Education Advisor. The courses must be graduate-level courses, and they may be taken in music or in other departments.

VI. Composition Concentration Courses:

Students are required to complete 32-33 credit hours (maintaining a cumulative grade point average of B or better) to be granted the degree Master of Music: Composition. All students take the following:

MUSC 601 Master's Recital 3

MUSC 611 Studies in Music History 3

MUSC 621 Chamber Ensemble: Still Breathing 3

MUSC 622 Materials and Methods of Research 3

MUSC 661 Advanced Private Study: Conducting 3

MUSC 661 Advanced Private Study: Composition 2

MUSC 662 Advanced Private Study: Composition 2

MUSC 663 Advanced Private Study: Composition 2

MUSC 684 Recording Techniques 3

MUSC 688 Principles of Music Industry Practicel 3

MUSC 695 Avanced Analytical Techniques 3

One of the following Electives:

MUSC 631 Advanced Arranging 3  
or

MUSC 664 Advanced Private Study: Composition 2

or

MUSC 697 Advanced Jazz Harmony 3

## Physics (MS, PhD)

Telephone: (302) 831-2661 or 831-2662

<http://www.physics.udel.edu>

Faculty Listing: <http://physics.udel.edu/research>

### Program Overview

The Department of Physics offers graduate programs leading to the MS and PhD degrees. The Department is located in Sharp Laboratory, which houses a physics library, research and teaching laboratories, a fully equipped and staffed machine shop, and an electronics shop.

The faculty of the Graduate Program are involved in a variety of experimental and theoretical research activities focused on the areas of condensed matter and materials physics, atomic and molecular physics, astronomy, astrophysics, space physics, and high energy physics. In-house experimental research laboratories are well equipped for studies of condensed and molecular matter. Off-campus research activities involve high altitude balloon flights, a worldwide network of neutron monitors, ultra-high energy cosmic ray and solar flare observatories in Antarctica, and gamma-ray telescopes in Arizona. Faculty also conduct research at national laboratories, both in the U.S. and abroad, and make frequent use of ground- and space-based astronomical observatories.

### Requirements for Admission

Admission is selective and competitive, based on the number of well-qualified applicants and the limits of available faculty, facilities and financial resources. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. Applicants should have an undergraduate grade point average of at least 3.2. In addition, scores for the Graduate Record Exam (GRE), Verbal, Quantitative and Analytic, and the GRE Physics Subject Test and a complete official transcript or equivalent certified written record of academic work to date are required. At least three letters of reference should be sent independently by persons familiar with the applicant's academic work. Students whose first language is not English must provide a score for the Test of English as a Foreign Language (TOEFL). For financial support, a TOEFL score exceeding 600/250/100 is required.

## Financial Aid

Financial aid is available to graduate students in the form of teaching and research assistantships, and research fellowships. Inquiry regarding these appointments may be made when applying for admission. Please refer to Graduate Fellowships and Assistantships for additional information.

## Requirements for the MS Degree

Students may choose to obtain an MS degree with or without thesis.

The MS without thesis degree requires 30 credit hours in PHYS courses, including at most 3 credits of research (PHYS 868). At least 6 credits of classroom courses must be at the PHYS 800 level. In addition, the degree candidate will survey the literature on a current topic in physics or astronomy, write a report on this topic and make a public presentation to the department, represented by three members of its faculty.

The MS with thesis requires 24 credits hours in PHYS courses, including at most 3 credits of research (PHYS 868). At least 6 credits of classroom courses must be at the PHYS 800 level. In addition 6 credits of thesis work (PHYS 869) are required. The purpose of the MS thesis is to demonstrate that the student can conduct research under supervision and communicate the results clearly in English. The thesis is defended in an oral examination administered by a committee of three members of the Department.

## Requirements for the PhD Degree

Students may enter the PhD program after successfully completing an MS degree program, at the University of Delaware or elsewhere, or may be admitted directly to the PhD program directly after a Bachelors degree. To obtain a PhD, students will normally follow the course intensive regular track. Students entering the program with an MS degree in Physics or Astronomy that are particularly well prepared may choose to follow the less coursework intensive fast track.

## Course Requirements

Students on the regular track must satisfy the following course requirement:

-Taking and passing, with an average grade of 3.0 or better, 30 credits of course work within the first five semesters after entering graduate

school. At least 18 of these credits must be from among 800-level PHYS courses excluding PHYS 868. Of these 18 credits at the 800 level, 12 credits (i.e., 4 courses) must come from the following group of 6 courses. These courses have to be passed with a grade of B- or better. PHYS 809, PHYS 810, PHYS 811, PHYS 812, PHYS 813, PHYS 815.

Students following the fast track must meet the following course requirements to remain on that track:

-Taking at least 12 credits of PHYS classroom courses at the 800-level within their first year.

## PhD Candidacy Examination

The exam will be graded as a whole and will consist of 4 sections, each with 4 problems. The sections of the exam and the textbook and associated material from which that section will be based are: 1) Classical mechanics - covering all the material except chapters 4 and 14 in S.T.Thornton and J. B. Marion, "Classical Dynamics of Particles and Systems," 5th edition; 2) Electricity and Magnetism - covering all material in D. J. Griffiths, "Introduction to Electrodynamics," 3rd edition; 3) Statistical Mechanics and Thermodynamics - covering chapters 1-9 in F. Reif, "Fundamentals of Statistical and Thermal Physics;" 4) Quantum Mechanics - covering chapters 1-8 in B. H. Brandsen and C. J. Joachain, "Quantum Mechanics," 2nd edition. Special relativity problems, if any will only appear on the Electricity and Magnetism section of the exam.

The exam will be given twice a year in late August and in late January. The exam must be passed no later than the first offering after completing 3 semesters in the graduate program (this means that Fall admits need to pass the exam given in January before the start of their 4th semester).

If a student on the fast track has not passed the written part of the exam after two semesters, the Graduate Review Committee will promptly review the student's progress and issue a determination whether the student should remain on the fast track or should shift to the regular track.

The oral candidacy examination: Within 18 months after passing the written part of the PhD candidacy exam, a PhD candidate shall make an oral presentation on the proposed thesis research to a committee consisting of the

members of the PhD thesis committee and two additional members appointed by the director of the graduate program. This committee shall examine the students in matters regarding the proposed research program. A student who fails the examination has one opportunity to retake the exam. This has to take place within 6 months of the original examination.

## PhD Thesis

Upon successful completion of a research program, the PhD candidate will write a dissertation showing originality of thought and scholarship, properly expressed in English. The dissertation is defended in an oral examination administered by the student's dissertation committee.

## Political Science and International Relations (MA, PhD)

Telephone: (302) 831-2356

<http://www.udel.edu/poscir>

Faculty Listing: <http://www.udel.edu/poscir/people/faculty.shtml>

## Program Overview

The Department of Political Science and International Relations offers both master's and doctoral degrees. The graduate program is a PhD focused program consisting of coursework during the first six semesters followed by dissertation research and writing. A limited number of students interested in a terminal master's degree will be admitted to a master's track. The master's degree is a two-year, 38 credit hour program. The PhD program is a 62 credit hour program. Students admitted to the master's track but who wish to pursue the PhD degree may apply to the PhD program during their second year of the graduate program.

Graduate study in the department is organized around the theme of global governance. Global governance may be defined as an approach to politics and public policy that transcends the nation-state and its formal institutions of government. It is global because it recognizes that virtually all problems on the public agenda - environment, gender, security, migration, etc - transcend in their scope, source, and solution national boundaries. It is governance (rather than "government") because non-formal, non-state actors - nongovernmental organizations, interest groups, professional associations, and so forth - have increasingly been accorded legitimacy in rule-making and rule-enforcement. The global

governance perspective does not insist that the traditional nation-state has collapsed, or even that such a collapse is inevitable. It does suggest, however, that we increasingly live in a world characterized by powerful tensions between the formal governmental institutions of individual nation-states on the one hand and a vast array of transnational, non-state forces on the other. It is this tension, with each set of forces laying claim to political legitimacy, that will shape the politics of the next century.

## Requirements For Admission

Applicants for financial aid should submit completed applications by February 1. Except for unusual circumstances, all other completed applications should be received by May 15 for admissions effective the following September.

To be accepted into the program students are evaluated on several criteria:

- Performance on the GRE (normally a minimum of 1100 for the combined verbal and math aptitude scores).
- Undergraduate grade-point averages (normally a 3.0 overall and 3.25 in major field and a 3.5 in any prior graduate work in political science).
- Three letters of recommendation.
- For international students, a TOEFL score (normally at least 600 paper-based or 100 internet-based).

Applicants are encouraged to submit examples of written work.

Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

For Students with Previous Graduate Education: Students arriving with an MA degree, in political science or another discipline, must nonetheless begin anew in our program and complete all its requirements, including core and track course work.

According to University policy up to nine credits from previous graduate coursework - credits NOT used to obtain a degree elsewhere, however - may transfer in to UD. These must be approved by the Director of Graduate Studies after reviewing relevant syllabi, and generally transfer in as elective credits.

In some instances it may be appropriate for the Director of Graduate Studies to permit the substitution of another UD course for a course requirement that has already been fulfilled by a very similar course taken at a previous institution. However, this may be done no more than twice for any given student, and the replacement course should be related to the forgiven course (e.g. a more advanced UD methods course may be substituted for our POSC 815 if a course similar to 815 was taken elsewhere; an upper level topical or theory course might substitute for an introductory one, etc).

#### Financial Aid

- Funding is available to graduate students in the form of graduate assistantships (for teaching and/or research), tuition scholarships and University fellowships. These awards are merit based.
- Students who receive graduate assistantships or fellowships must achieve a grade of B or higher in every course while taking a minimum of 9 credit hours per semester (unless fewer than 9 credits are needed to complete the credit requirements for the degree). Retention of funding from the Department normally requires a student to maintain a GPA of above 3.50. Occasionally there is a re-allocation of funding in December, especially if new resources have come available. In addition, all funding allocations are reviewed each February by the Graduate Admissions Committee, to make funding decisions for the coming year. If a student is in jeopardy of losing funding, the Department will follow University procedures and give written notice of this, and a timeframe in which a student may improve their performance.
- Students who receive graduate assistantships or fellowships are expected to work 20 hours per week and must satisfactorily fulfill the requirements of their positions. Work may consist of teaching or research.
- Any student who, in the judgment of the Director of Graduate Studies, with the advice of the graduate faculty, fails to demonstrate sufficiently strong performance in his or her studies, research, and teaching (as applicable) will be subject to the suspension of his or her graduate assistantship, fellowship or tuition scholarship, as per University procedures.
- Funding is awarded on an annual basis. Students entering the graduate program with funding may anticipate funding for up to four years, depending upon academic performance

faculty evaluations, and performance as graduate assistant.

#### Requirements for the Degrees

Each student will complete a minimum of 38 credits.

##### 1. Core Global Governance Courses: 15 credits

- POSC 815 Introduction to Statistical Analysis for Political Science
- POSC 830 International Relations Theory
- POSC 843 Global Governance Theory and Cases
- POSC 806 Normative Issues in Global Governance

##### 2. Track Courses: 15 credits.

Each student will choose and declare one of three tracks within the global governance program by the end of their first semester. Track requirements consist of the completion of two required track courses and three elective track courses. The tracks and courses are listed below:

##### Track 1: The United States and the World

Required Courses: (choose 2 from the following three courses)

- POSC 807 American Political Behavior
- POSC 808 American Political Institutions
- POSC 813 American Foreign Policy

Elective Courses:

3 from the following list and additional courses as approved by the Director of Graduate Studies.

- POSC 804 Post Industrial Systems
- POSC 805 Public Law
- POSC 818 Environmental Politics Administration
- POSC 826 Islam in global Affairs
- POSC 838 Public Policy Analysis
- POSC 840 International Political Economy
- POSC 844 International Security
- POSC 845 Human Rights and Global Governance

##### Track 2: Global Processes and Transnational Issues

Required Courses: (choose 2 from the following three courses)

- POSC 844 International Security
- POSC 842 International Organization
- POSC 840 International Political Economy

Elective Courses:

3 from following list and additional courses as approved by the Director of Graduate Studies.

- POSC 802 Developing & Transitional Systems
- POSC 804 Post Industrial Systems

POSC 813 American Foreign Policy  
POSC 818 Environmental Politics and Policy  
POSC 824 Topics in European Politics  
POSC 826 Islam in Global Affairs  
POSC 838 Public Policy Analysis  
POSC 845 Human Rights and Global Governance

### Track 3: A Comparative Perspective

#### Required Courses:

POSC 802 Developing and Transitional Systems  
POSC 804 Post Industrial Systems

#### Elective Courses:

3 from the following list and additional courses as approved by the Director of Graduate Studies.

POSC 808 American Political Institutions  
POSC 811 Topics in Comparative Politics  
POSC 813 American Foreign Policy  
POSC 824 Topics in European Politics  
POSC 826 Islam in Global Affairs  
POSC 840 International Political Economy  
POSC 845 Human Rights and Global Governance

### 3. Elective Courses and COGGS: 11 Credits

Students must take an additional three courses over the course of their program and the Colloquium on Global Governance and Society (COGGS – POSC 850) for one credit each spring of their first two years. Students may take no more than one 3-credit independent study in their first two years of coursework. Students are not permitted to take independent study courses in their first two years unless they submit a petition and course design, to be approved by the Director of Graduate Studies.

### 4. Writing requirement

Students not moving further into the PhD program will prepare a major research paper, usually initially for one of their graduate seminars. For the purposes of this requirement, the Department understands a “major research paper” to be one that addresses an important and well-defined topic, demonstrates mastery of the pertinent literature, strives to make an original contribution to knowledge, and is presented in a coherent and professional manner. In meeting this requirement, students are to identify an appropriate academic journal and write the paper as if they were preparing a manuscript for submission to that journal. This research paper is to be handed in to the professor for whom the paper was originally written, or the most appropriate professor, in May of the second year, as part of the completion of the MA requirements. It is the prerogative of that professor to determine

whether the student’s work meets the test of this definition. Students will register for POSC 899 MA Long Paper Course (0 credits) in the spring of their second year to facilitate completion of this requirement. Requirements for the PhD Degree

### Requirements for the PhD Degree

All requirements listed for the Master’s Degree, plus 24 additional credits to total 62.

**Secondary Track Requirements: 9 Credits** All students will choose a secondary track in the fall semester of their third year. In this secondary track students must complete one of the two required courses and two track electives, or both required courses and one track elective.

**Research Seminar: 3 Credits** All students must complete a research seminar in conjunction with the Colloquium on Global Governance and Society (COGGS – POSC 850) in the spring semester of their third year. This seminar will provide a significant research experience in addition to the speaker series. Students are expected to complete a major research paper, grant proposal, or dissertation proposal and will present their work.

**Philosophy of Science and Research Design (POSC 816): 3 Credits** This is a required course, to be taken in the fifth semester.

**Additional Research/Candidacy Credits: 9 Credits** Students will enroll in 9 credits of POSC 969 (dissertation credits).

**Long Paper Defense** All students who wish to pursue their doctoral degree are required to undertake an oral exam by March 15th of their second year. This involves students making an oral presentation of the paper they are submitting in fulfillment of the master’s writing requirement. They will be examined by a three-person committee consisting of the faculty member for whom the paper was originally written (serving as chair), and two other faculty members best able to comment on the substance of the paper (as approved by the Graduate Director). The paper should meet the expectations of the MA writing requirement – i.e. it should be a “major research paper” etc. Students should identify committee members the previous December (end of third semester), revise their paper over winter session, and schedule their paper defense to take place before March 15th of their fourth semester. A written assessment of student performance in their defense is transmitted to the Graduate

Performance Review Panel, as part of the assessment materials for moving on to the third year. Students who do not pass the Long Paper defense may receive a master's degree upon completion of the requirements for that degree. PhD students who defend their paper successfully also receive MA degrees. Students will register for POSC 899 (0 credits) in their fourth semester to facilitate completion of this requirement.

**Graduate Performance Review Panel** All students who wish to pursue their doctoral degree will be reviewed by this Review Panel in early April of their second year. The Panel will decide to accept or reject students in their bid to enter the dissertation proposal and field exam phase. This panel is comprised of the Director of Graduate Studies and the Graduate Admissions Committee. Materials to be used in the review include: a student's GPA and course record, faculty evaluations of students in seminars and as GAs, and the written assessments of student performance in their Long Paper defense. Notice of approval of a student by the Review Panel will be sent to the Office of Graduate Studies. Students who are rejected by the Review Panel will be recommended for dismissal from the graduate program by the Office of Graduate Studies.

**Skills Requirement** All candidates for the PhD degree shall demonstrate competence in one language other than English OR an expanded methods competency. Procedures for certifying language competence are supervised by the Director of Graduate Studies, and are completed via a translation exercise assessed by a Departmental or University faculty member with competency in the given language and should be completed before the dissertation proposal defense. As candidates whose first language is other than English have already demonstrated competence in a second language by appropriate scores on the TOEFL exam, this requirement shall be deemed met in such cases. To complete this requirement via further methods training, students shall take one additional research methods course (beyond 815 and 816) or participate in an external methods course/workshop.

**Third-Year field Exams** Students will take two, two-day written, "take home" field exams in May of their third year, 1-2 weeks apart. These exams expect students to demonstrate a mastery of the literatures relevant to the two tracks they have studied and require the entire third year for preparation. The fields are based

around the three existing tracks (America and the World, Global processes and Transnational Issues, Comparative perspectives). A Field Exam Committee will be created for each field and will prepare field reading lists, prepare the questions at exam time and do the grading. Field reading lists will also include global governance/transnational readings relevant to each field and will have integrated committees to enable grading of these materials. The field exams are administered by the Director of Graduate Studies and the Graduate Secretary. Exams are distributed at 8:30 a.m. the first day and are due back by 4:00 p.m. the second day.

The primary field exam consists of two parts. Part I covers the major literature and questions of the field itself. Part II is a section tailored to the individual research specializations of students (e.g. the politics of a particular region, a major sub-field, a variety of theory). Students submit their own reading list for this section and nominate two appropriate faculty to write and grade questions for them.

- Students must pass both Parts I and II to pass the exam.
- The secondary field exam is constructed and administered in a similar fashion, 1–2 weeks after the primary field exams. However, it does not have a second, tailored section and shall require fewer questions to be answered.
- Answers are read and graded by the respective Field Exam Committee and, in the case of Part II of the primary field exam, by those nominated faculty. Grades are then reported to the Director of Graduate Studies. Possible grades on the exam are; Distinction, Pass, Deficient and Fail. Distinction and Pass are considered passing grades. Results of the field exams will be made known to students as soon as all exams have been graded, usually within two to three weeks.
- Students who receive an aggregate grade of Deficient or Fail on either section of the primary field exam or on the secondary field exam will be permitted to undertake a second written examination on that section, with new questions written by the relevant Field Exam Committee, some time not long after the first result was reported. Grades on this re-take are Pass and Fail. Students who achieve a Pass on this exam shall be considered as having successfully discharged their examination requirement. If a student fails the re-take exam(s), he or she will be recommended to the Office of Graduate Studies to be terminated from the program.
- Students who wish to sit for the field exams must be in good standing, have at least a 3.0 GPA, and have no "Incompletes" outstanding.

## Admission to Candidacy Exam (Dissertation Proposal Defense)

A PhD student shall be officially admitted to candidacy upon successful completion of a candidacy oral examination by a faculty committee (oral defense of the dissertation proposal). Although the precise form of the dissertation proposal will vary from case to case, it is expected to include a clear statement of the problem and an explanation of its significance, a discussion of the methods proposed to investigate the problem, and a full discussion of relevant literature.

The candidacy examination should be held at the end of the spring semester of the student's third year, or the beginning of the fourth year, and not later than October 1 of the student's fourth year.

The candidacy examination committee shall be convened and chaired by the student's dissertation chair and shall consist of members of the student's proposed dissertation committee. Normally students are expected to select a dissertation chair from faculty whose primary appointment is in the Department. In exceptional circumstances, students may petition the Graduate Policy Committee for approval to have someone whose primary appointment is outside the Department chair the dissertation committee. In deciding whether or not to grant approval, the Graduate Policy Committee shall take into account the needs of the student and the Department.

Other members of the Department are welcome to participate as non-voting members of the candidacy examination committee. The candidacy examination shall be announced and copies of the dissertation proposal shall be made available to all faculty at least one week in advance of the examination.

The candidacy examination committee is charged with determining the student's fitness for advancement to candidacy. The main question the committee has to answer is, 'Is this student prepared to write an acceptable PhD dissertation?' In seeking to answer this question, the committee's focus shall be on the student's dissertation proposal, which shall be made available to all members of the Department at least one week in advance of the examination.

If, in the judgment of the committee, the student has passed the oral examination, he or she shall be admitted to candidacy, and shall begin work on the dissertation (see Section 9).

If, in the judgment of the committee, the student has not passed the candidacy examination, the committee may direct the student to (a) rethink, rewrite, and resubmit

the proposal prior to a re-examination by the committee; (b) undertake remedial work in research design and methodology; or (c) any combination or variation of the above that the committee deems necessary. In the event that additional work is required, the committee will discuss with the student a reasonable time frame for completion of the necessary work. A written statement completed by the student's dissertation adviser should set forth the nature of the work to be undertaken by the student and the time frame that was agreed upon. This shall be sent to the student, circulated to the faculty members who participated in the oral examination and become part of the student's permanent file. At the conclusion of the agreed upon time period, the committee will reconvene to assess the student's progress toward candidacy. The committee may determine that the student is unable to advance to candidacy and may be recommended to the Office of Graduate Studies for termination from the program.

## The Dissertation

A PhD dissertation is a manuscript that reflects "the results of original and significant research written in a scholarly and literate manner worthy of publication."

Students are expected to consult closely and regularly with members of their dissertation committee, particularly the committee chair.

Upon completion of the manuscript, a final oral examination – or "dissertation defense" – must be passed. Ordinarily, students will be asked to summarize the major findings of their research and evaluate the significance of these findings for the field more generally. The student shall then be called upon to defend the findings in the face of questions from members of the dissertation committee and other members of the academic community who choose to attend. If, after deliberating, the dissertation committee is unable to reach agreement on whether the student has successfully defended the dissertation, the committee will adjourn after explaining the nature of their objections and providing suggestions on how these might be satisfactorily addressed with guidance from the dissertation chair. It shall be the responsibility of the dissertation chair to reconvene the group to reconsider the revised product.

Detailed guidelines for the preparation and presentation of the dissertation are described in Regulations Governing Theses and Dissertations, which may be obtained from the Office of Graduate Studies. It is also online on the Office of Graduate Studies home page.

**Teaching Experience** Candidates for the PhD degree planning an academic career are encouraged to obtain teaching experience at the University level. Opportunities to gain this experience may be available either through teaching assistantships, lectureships in political science courses at the University of Delaware, or neighboring universities.

**Conference Experience** Advanced PhD students are also encouraged to present their work at national and international conferences. Funding from the Department and the Office of Graduate Studies may be applied for to help defray the cost of conference participation for those students presenting papers.

## **Psychology (MA, PhD)**

Telephone: (302) 831-2271

<http://www.psych.udel.edu/graduate/index.asp>

Faculty Listing: <http://www.psych.udel.edu/people/index.asp>

### **Program Overview**

The Department of Psychology offers a doctoral degree program in psychology, with specialization in the areas of social psychology, cognitive psychology, behavioral neuroscience, and clinical psychology. Students in the doctoral program can earn an optional Master's Degree by submitting a thesis, but all students are required to continue for the doctorate. The objective of the program is to train researchers who will broaden the base of scientific knowledge upon which the discipline of psychology rests. Major emphasis is given to preparation for research. Other emphases include preparing students for teaching and for the practice of clinical psychology. The clinical training program is accredited by the American Psychological Association.

### **Research Facilities**

The Psychology Department has excellent laboratory and computer facilities to support graduate training. The research space, much of it newly designed and renovated, allows for research in animal behavior, cognitive processing, child development, electrophysiology, pharmacological and physiological bases of animal behavior, psychophysiology, small group behavior, interpersonal communication and psycholinguistics. All laboratories have several computers and terminals that link the department to the University-wide computing system. The department also has several

small, general purpose laboratories, useful for performing animal surgeries and histology. Training for clinical practice is provided in a separate facility containing several consultation rooms designed for supervision of testing and therapy.

### **Requirements for Admission**

Students are admitted directly to the doctoral program. A combination of criteria is used in evaluating candidates for admission to graduate study in psychology: scores made on the Graduate Record Examination, undergraduate grade-point average, letters of recommendation, and in some cases, information gained from a personal interview. The minimum admission requirements are about 1200 GRE total and a 3.5 GPA, or some combination of equal merit. Those who meet these requirements are not guaranteed admission, nor are those who fail to meet the requirements necessarily precluded from admission, if they offer other appropriate strengths. Undergraduate research experience is looked on very favorably. An undergraduate degree in psychology is not required for admission, but students may be required to make up deficiencies in their background by enrolling in appropriate undergraduate courses. Deadline for application is January 7.

### **Financial Aid**

Financial aid is available in the form of teaching and research assistantships, fellowships, and tuition scholarships. Application materials are available from the chair of the Graduate Committee. Please refer to Graduate Fellowships and Assistantships for additional information.

### **Requirements for the Degrees**

In the first three years, students complete statistics courses and seminars in areas outside their specialization. These courses provide broad training in psychology and other allied disciplines, including neuroscience, cognitive science, and linguistics. In their specialization areas, students also complete course work and conduct research for the second year project.

Successful completion of the qualifying exam and the dissertation proposal are necessary for admission to candidacy for the PhD. Progress toward the PhD is achieved through completion of advanced work, dissertation research, and a clinical practicum and internship for students in the clinical area.

## **Neuroscience: A 4+1 Bachelor + Master of Science in Neuroscience**

Telephone: (302) 831-2271

Website: <http://www.psych.udel.edu/advisement/index.php/degree-requirements/bachelor-of-science-in-neuroscience-requirements/>

Faculty Listing: <http://www.psych.udel.edu/index.php/people/list/category/faculty/>

The Department of Psychology offers a special 4+1 Bachelor + Master of Science in Neuroscience to highly qualified undergraduate students who are extant Neuroscience majors at the University of Delaware. This program allows exceptional students to accelerate their undergraduate studies in Neuroscience to also earn a Master's Degree in Neuroscience (30 graduate credits) in 5 years of full-time study at the University of Delaware, with a savings of about 50% in expenses and time required for a traditional Master of Science Degree. Students would normally apply for conditional acceptance in the second semester of their junior year (with a GPA > 3.25, two letters of recommendation, and having identified a faculty research mentor). Thereafter, the student will: a) be mentored into an accelerated undergraduate neuroscience curriculum that includes a senior-year research project, b) satisfy their senior-year evaluation of "good standing" and make formal application to the Graduate School, then c) complete a graduate summer research internship (6 credits) and thesis proposal, d) complete a fifth-year curriculum of graduate studies in neuroscience, and e) submit their Master's Thesis research and defend it orally.

## **School of Public Policy and Administration**

Telephone: (302) 831-1687

[www.sppa.udel.edu/](http://www.sppa.udel.edu/)

Faculty Listing: [www.sppa.udel.edu/content/faculty-staff-directory](http://www.sppa.udel.edu/content/faculty-staff-directory)

### **Program Overview**

The School of Public Policy and Administration offers opportunities for graduate work in urban affairs, public policy, and public administration. Three degrees are available: Master of Arts and Doctor of Philosophy in Urban Affairs and Public Policy, Master of Public Administration, offered in conjunction with the Department of Political Science and International Relations.

Course work in the School is organized on a multidisciplinary and policy-oriented basis.

Faculty members are drawn from political science, economics, sociology, geography, public administration, planning, law, and related fields. In addition, students have numerous opportunities to work on community and policy-related research and service projects undertaken by the school through its various affiliated centers. Students may also work in public and non-profit professional agencies through the school's internship program. The School is nationally recognized for its integration of theory and practice - "The Delaware Model" of public affairs education.

### **Requirements for Admission**

The admission policy of the School of Public Policy and Administration seeks to foster a diverse student body in terms of age, sex, race and cultural background. The School, therefore, uses several criteria in assessing a prospective student's motivation, interests, and ability to perform successfully in its graduate programs. The qualifications of each applicant are considered in the context of the student's unique background, accomplishments, and interests. While the three degrees are aimed at students with different career goals, the admissions committees consider these criteria when evaluating all applicants:

- Genuine interest in and motivation to undertake academic work in urban affairs, public policy, or public administration, as evidenced by application material and, for PhD students, an interview with the program director, or a member of the program admissions committee.
- The ability to complete a graduate degree program successfully, as reflected in prior academic work, and letters of recommendation from faculty, Graduate Record Examination General Test scores, and examples of academic or professional written work of the candidate.
- Ability to apply previously acquired competencies to problem areas, community, or organizational needs as measured by contributions in and the nature of professional work experience, volunteer service and/or internships with assessments by faculty, professionals, and/or community leaders. Indicators of the quality and extent of previous professional work experience suggestive of the capability for a public service career are particularly important with regard to admission to the M.P.A. program.
- For students whose first language is not English, a minimum score of 213 on the computer-based test or 550 on the paper-based test or 79 on the IBET Test of English as a Foreign

Language (TOEFL) is required.

In addition, admission to the PhD program requires completion of a master's degree. Generally those admitted to the PhD program of Urban Affairs and Public Policy have combined scores on the quantitative and verbal aptitude portions of the GRE above 1100. Academic performance at the master's level, potential for professional achievement, and compatibility of student interests with areas of research specialization in the program are key criteria for admission to the PhD program.

Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

Center For Historic Architecture And Design (CHAD) Disaster Science and Management (MS, PhD)

## **DISASTER SCIENCE AND MANAGEMENT**

Telephone: (302) 831-6618

[www.sppa.udel.edu/content/ms-disaster-science-and-management](http://www.sppa.udel.edu/content/ms-disaster-science-and-management)

[www.sppa.udel.edu/content/phd-disaster-science-and-management](http://www.sppa.udel.edu/content/phd-disaster-science-and-management)

Faculty Listing: [www.sppa.udel.edu/content/people](http://www.sppa.udel.edu/content/people)

### **PROGRAM OVERVIEW**

The Disaster Science and Management (DISA) program offers programs leading to master's and doctoral degrees. It is an interdisciplinary program that draws faculty from several different units including the Department of Civil and Environmental Engineering, the Department of Political Science and International Relations, the Department of Sociology and Criminal Justice, the School of Public Policy and Administration, the School of Nursing, and the College of Earth, Ocean and Environment. The program is administered through the Disaster Research Center and the School of Urban Affairs & Public Policy. Two graduate degree programs are offered: a Master's in Science and a Doctor of Philosophy.

### **REQUIREMENTS FOR ADMISSION**

Students will be admitted to the program based on enrollment availability and their ability to meet the following minimum recommended entrance requirements. Applicants to the MS program must have:

- Baccalaureate degree from an accredited college or university.
- A recommended GRE score of 1050 on math and verbal sections combined
- An undergraduate GPA of 3.0 or higher
- Written statement of goals and objectives (the personal statement) that clearly identifies the applicant's research and curriculum interests and explains how admission to the program will facilitate his or her professional objectives.

Applicants to the PhD Program must have

- MS or equivalent degree from an accredited college or university
- A recommended GRE score of 1050 on math and verbal sections combined
- A graduate GPA of 3.5 or higher.
- Written statement of goals and objectives (the personal statement) that clearly identifies the applicant's research and curriculum interests and explains how admission to the program will facilitate his or her professional objectives.

Admission to the graduate program is competitive. Those who meet stated minimum requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer appropriate strengths.

### **FINANCIAL ASSISTANCE**

Financial assistance for students in the DISA program is available on a competitive basis. Preference for graduate student stipends will be first given to students in the PhD Program, then students in the MS program with the thesis option and finally to students in the MS program with no thesis. Students receiving full stipends will be expected to work 20 hours per week on faculty projects and students are expected to maintain full-time status.

### **REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN DISASTER SCIENCE AND MANAGEMENT**

Students are required to work with their advisor during their first semester of study and develop a plan of study. The Master of Science

in Disaster Science and Management requires 30 credits. The non-thesis option requires 24 credits of graduate level coursework, at least 3 semesters of seminar (DISA 680 Disaster Science and Management Seminar ) (taken at least 2 semesters at 1 credit per semester and 1 semester as a listener), and 4 credits of practicum. The thesis option includes 21 credits of graduate level courses, at least 4 semesters of seminar (DISA 680 Disaster Science and Management Seminar ) (taken at least 2 semesters at 1 credit per semester and 2 semesters as a listener), 1 credit of practicum, and 6 credits of thesis.

The coursework credits are specified in the student's plan of study and must include:

Core courses 9  
Credits

DISA 650 Introduction to Disasters/  
Historical Aspects of disasters 3

POSC 656 The Politics of Disaster/  
Public Policy Aspects of  
Disasters 3

DISA 651 International Aspects of  
Disasters/Development/  
Comparative Analysis 3

Research/Methods/Analysis Courses

Non-Thesis Option 3  
Credits

EDUC 850 Qualitative Research  
or  
EDUC 665 Elementary Statistics 3

Thesis Option 9  
Credits

Take both EDUC 665 and EDUC 850 and one of the following:

UAPP 698 Management Decision  
Making in Public and  
Non-Profit Sectors 3

or  
MAST 663 Decision Tools for Policy  
Analysis 3

#### REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN DISASTER SCIENCE AND MANAGEMENT

The Doctor of Philosophy in Disaster Science and Management requires 42 credits of graduate-level coursework beyond the master's degree and 9 credits of dissertation. Students are expected to choose a thematic area. The 42 credits of coursework are specified in the individual planned program of study, and must include at least 9 credits from a thematic area; at

least 6 credits of research methods (qualitative or quantitative); and 9 credits of PhD Thesis in the thematic area.

In addition students must register for and attend three semesters of seminar (DISA 680). Students are expected to participate in seminar as a listener for other semesters that they are on campus. Additional courses are electives but should be selected in consultation with the student's advisor. Urban Affairs and Public Policy (PhD)

#### PhD Program In Urban Affairs And Public Policy

Telephone: (302) 831-1687

<http://www.sppa.udel.edu/content/phd-degree-urban-affairs-and-public-policy>

Faculty Listing: <http://www.sppa.udel.edu/content/faculty-staff-directory>

The degree of Doctor of Philosophy is conferred in recognition of breadth of scholarly attainment and of demonstrated power to investigate problems independently and effectively. In approaching the problems of an urban society, students are expected to develop theoretical and substantive skills. The doctoral program is interdisciplinary and seeks to prepare students for research, teaching, and public policy problem-solving careers.

The structure of the program includes theoretical, policy, and methodological core courses, intensive study in an area of research and specialization, and the completion of a dissertation demonstrating the student's capacity for independent research. Below is an outline of the specific requirements of the PhD program in Urban Affairs and Public Policy.

Requirements For The PhD Degree (42-45 credits)

Required Core Courses 9

UAPP 801 Process of Social Inquiry (6 credits)  
Two of the following:

UAPP 821 Proseminar in Technology,  
Environment & Society

UAPP 822 Proseminar in Governance,  
Planning & Management

UAPP 823 Proseminar in Social &  
Urban Policy

Required courses in Research & Design  
Methods\* 6 \*Courses may not be UAPP 800 or  
UAPP 815

Specialization Requirements 15  
Teaching or Research Experience Requirements  
0-3

One of the following:

- UAPP 868 Research
- UAPP 862 Teaching Practicum in Urban Affairs & Public Policy (This course may be satisfied by the student being a TA for one semester.)

- UAPP 863 Doctoral Dissertation Proposal 3
- UAPP 969 Dissertation 9

### Urban Affairs and Public Policy (MA)

Telephone: (302) 831-1687

<http://www.sppa.udel.edu/content/ma-urban-affairs-public-policy>

Faculty Listing: <http://www.sppa.udel.edu/content/faculty-staff-directory>

The M.A. in Urban Affairs and Public Policy program emphasizes a multidisciplinary approach to understanding communities and the policies that affect them. The 36-credit-hour program can be pursued full or part time. Students may choose one of the initial pre-defined areas of focus: urban and regional planning, housing and community development, health services policy, nonprofits and philanthropy, historic preservation, media and public policy, or, with the assistance of a faculty advisor, design a special area of focus. The core integration of academics, public service, and research makes our program a leader in the field as well as a model for the combination of theory and practice. Students take courses and simultaneously engage in service and research for public, private, and nonprofit organizations.

#### Requirements for the MA Degree (36 credits)

##### Core Courses

- UAPP 619 Contemporary Issues in Urban Affairs 2
- UAPP 703 Urban Society & Public Policy 3
- UAPP 702 Research Methods for Urban & Public Policy 3
- UAPP 691 Quantitative Analysis in Public & NP Sectors 3
  
- UAPP 613  
or  
UAPP 628 Planning Theory & Urban Policy  
or  
Issues in Land Use and Environmental Planning 3
- UAPP 701 Public Policy 3
- UAPP 693 Economics in Public & NP sectors 3

Area of Focus 10-13  
Depending on whether the student chooses

the Analytical Paper or Thesis option, student take between 10 and 13 credits of additional coursework that collectively define an area of focus. Faculty will pre-define several areas that the School has strength in, but students are also free to develop their own area of focus with the advice and consent of their academic advisor. The pre-defined areas of focus include:

- Urban and Regional Planning
- Housing and Community Development
- Health Services Policy
- Nonprofits and Philanthropy
- Historic Preservation
- Media and Public Policy

Thesis Option

Thesis 6

Non-thesis Option

Analytical Paper 3

### Public Administration (MPA)

Telephone: (302) 831-1687

<http://www.sppa.udel.edu/content/master-public-administration>

Faculty Listing: <http://www.sppa.udel.edu/content/faculty-staff-directory>

The program in public administration is jointly offered by the School of Public Policy and Administration and the Department of Political Science and International Relations. The mission of the Master of Public Administration program is to provide diverse, talented graduate students with specific competencies for leadership and management, including the knowledge, skills and values essential to accountable and effective practice.

The MPA program contributes directly to solutions to public challenges of our times through research and public service projects that involve students in experiential learning. The program also seeks to develop relationships with practitioners, fostering a professional focus and approach to public administration and non-profit management and furthering the values of the field.

The 42-credit curriculum is divided into core subjects, areas of specialization, an internship and a writing assignment. The core curriculum deals with ideas and concepts related to the field of public administration, human resources management, public financial management, management decision making, quantitative analysis, information technology

for public managers, organizational leadership, administrative/employment law, and public economics.

Specialization areas include Nonprofit Management, Public Management and Policy and Program Development. Within these broad specializations, students focus in a topic area such as state/local management, educational policy, environmental and energy management, planning and infrastructure, international affairs, public policy analysis, financial management, and health policy and management. With the approval of their academic advisor and the MPA program director, students may design their own area of specialization.

Students must research, write and defend a management or policy brief under the direction of a faculty committee. With the approval of the MPA Program Director, qualified practitioners may also participate on these committees.

All M.P.A. candidates must complete a professional-level internship (unless it is waived by the Internship Coordinator). Typically, internships are with governmental agencies, community organizations, advocacy groups, nonprofit institutions, or for-profit organization engaged in the public good. Upon approval of the faculty, students may pursue a thesis in lieu of an internship.

#### Requirements for the M.P.A. Degree (42 credits)

##### Core Courses

UAPP 690	Seminar in Public Administration	3
UAPP 691	Quantitative Analysis	3
UAPP 692	Management Decision-Making in Public & Nonprofit Sectors	3
UAPP 693	Public Economics	3
UAPP 694	Financial Management in Public & Nonprofit Sectors	3
UAPP 695	Administrative and Employment Law	1
UAPP 696	Human Resources Management in Public & Nonprofit Sectors	2
UAPP 697	Leading Organizations in Public & Nonprofit Sectors	3
UAPP 698	Information Technology for Planning & Administration	3
UAPP 699	Management /Policy Brief	1
UAPP 658	Contemporary Issues in Public Administration	1
UAPP 667	International Perspectives or Study Abroad	1
UAPP 860	Internship Seminar	1

UAPP 864 Internship Fieldwork 2

##### Specialization 12 - 15

There are four areas of specializations in the M.P.A. Program. Each specialization has its own course requirements and electives. The areas of specialization are:

- Nonprofit Management
- Public Management
- Policy and Program Development (faculty coordinated)
- Student-Designed Specialization (faculty approval required)

##### Thesis Option

Thesis 6

##### Non-thesis Option

Thesis may be substituted for 3-credit internship requirement plus a 3-credit elective. 6

##### Socially Responsible and Sustainable Apparel Business Certificate Program Overview

The Department of Fashion & Apparel Studies at the University of Delaware offers a graduate certificate in Socially Responsible and Sustainable Apparel Business. The certificate is comprised of nine, one-credit courses that are offered through the Internet. Because the courses are all offered through the Internet, it is possible to pursue the graduate certificate from any location in the world.

The graduate certificate provides a foundation of knowledge needed to manage design, product development, buying, promotion, sourcing, and production of apparel, textiles, and footwear in ways that are socially responsible and sustainable. The competencies and skills embedded in the courses are based on research with industry leaders and professionals who lead nongovernmental organizations and civil society groups with a stake in the global apparel business. The coursework is grounded on principles of the United Nations (UN) Global Compact, a voluntary international initiative bringing together companies, labor and civil society groups, and various UN agencies in support of human rights, labor, and the environment. The following learning goals have been established for students completing the certificate: 1) Evaluate how apparel, textile, and footwear businesses address the "Global Compact" principles for human rights, labor standards, and environmental stewardship and how they can more effectively address them in the future, 2) Analyze the moral and ethical responsibility of business and individuals

toward human rights labor standards, and environmental stewardship, and 3) Recommend various strategies for affecting change in the industries.

The courses and learning materials for the certificate were developed by a team of faculty from the University of Delaware, Cornell University, and Colorado State University based on work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Award No. 2006-01405.

Students completing the requirements for the graduate certificate will be awarded a certificate that is signed by the Department Chairperson and the Department's Graduate Studies Committee Chair. Additionally, a notation of receipt of the certificate will be made on the students' transcripts.

The graduate certificate in Socially Responsible and Sustainable Apparel Business is not associated with the Lerner College of Business and Economics.

#### Requirements for Admission

Individuals who are not currently University of Delaware students apply to the Office of Graduate and Professional Education. While applications are accepted year round, students wanting to begin the certificate program in Fall Semester should apply no later than July 1. Students wanting to begin in Spring Semester should apply no later than January 1. Prospective students are required to submit evidence of an undergraduate degree and prepare a statement of interest. To be successful in the program, prospective students need to be able to express themselves clearly in written English as there are readings, written assignments, and discussions with the instructor and other classmates. Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths. Those admitted for the graduate certificate are classified as nondegree students.

Graduate students who are currently pursuing a degree at the University of Delaware may take up to three of the required certificate courses without applying for admission into the certificate program. However, to take four or more required courses students must apply

by completing an application available from the Fashion and Apparel Studies Department and submitting a statement of interest.

#### FINANCIAL AID

Financial support for students pursuing the graduate certificate in Socially Responsible and Sustainable Apparel Business is not available. Students enrolled in a graduate degree program and pursuing the certificate may be eligible for financial support from their graduate degree program.

#### REQUIREMENTS FOR THE CERTIFICATE

##### Socially Responsible and Sustainable Apparel Business Certificate

The graduate certificate in Socially Responsible and Sustainable Apparel Business is comprised of a total of nine credits.

##### Labor and Environment Electives (3 credits)

Choose 3 courses from the following

FASH 696	Current Initiatives for Apparel Industry Labor Compliance	1
FASH 697	Worker-Centric Social Responsibility for Apparel Industry	1
FASH 698	Redesigning Green Apparel: Design, Sourcing & Packaging	1
FASH 699	Producing Environmentally Responsible Apparel	1

##### Foundation requirements (5 credits)

Choose an additional 5 courses from the following:

FASH 689	Apparel Supply Chains and Social Responsibility	1
FASH 691	Socially Responsible Apparel: Global Policy	1
FASH 692	Sustaining Global Apparel Supply Chains	1
FASH 693	Culture & Work in the Apparel Industry	1
FASH 694	Apparel Consumers and Social Responsibility	1
FASH 695	Bringing Social Responsibility to Apparel Corporate Culture	1
FASH 696	Current Initiatives for Apparel Industry Labor Compliance	1
FASH 697	Worker-Centric Social Responsibility for Apparel Industry	1
FASH 698	Redesigning Green Apparel: Design, Sourcing & Packaging	1
FASH 699	Producing Environmentally Responsible Apparel	1

Capstone Course:  
FASH 666 Special Problem 1  
(1 cr. is required, but students may take up to 6 cr.)

## **Sociology and Criminology (MA, PhD)**

Telephone: (302) 831-2581

<http://www.udel.edu/soc/>

Faculty Listing: <http://www.udel.edu/soc/faculty.html>

### Program Overview

The Department of Sociology and Criminal Justice offers a Master of Arts and a Doctor of Philosophy degree program in both sociology and criminology. The primary focus of the program is the preparation of members of the next generation of sociologists and criminologists by emphasizing systematic training in theory and research methodology as well as teaching. These advanced education degrees are intended for persons interested in careers in academia, public service, or private enterprise. The Department has a large number of full-time distinguished faculty (28) from the disciplines of Sociology, Philosophy, Law, Criminology, History and Criminal Justice. This allows students to work closely with faculty members while preserving a reasonable breadth of interests. Thus, while both the Sociology and Criminology degrees rely on strong theoretical and methodological foundations, they also allow students to tailor a program that meets their individual needs.

### Research Centers

The Center for Drug and Alcohol Studies (CDAS) was established at the University in 1991 and has been awarded a series of multi-million dollar research grants from the National Institute on Drug Abuse. CDAS has offices in Newark and Miami, Fla. CDAS was instrumental in setting up and evaluating a national model of Therapeutic Community treatment in criminal justice. Recently, CDAS was included in a small group of Research Centers nationally that will be leading research in implementing interventions for substance-involved clients in the criminal justice system. In addition to evaluating treatment programs in criminal justice settings, other ongoing studies include: The relation of school experiences to adolescent substance abuse, studies examining the efficacy of AIDS education and awareness programs, and studies which examine the epidemiology and etiology of substance abuse in general. CDAS also has major AIDS prevention initiatives in Florida, Latin

America, and the Caribbean. The focus of these initiatives is the development and evaluation of culturally specific HIV prevention programs for hard-to-reach and underserved populations.

The Center offers opportunities for research training for graduate students including stipends for research assistants and use of data sources.

### Requirements For Admission

Applicants should submit transcripts of all academic work, Graduate Record Examination scores (ideally a total of at least 1,000 on the verbal and quantitative tests) and three letters of recommendation. The deadline for completed applications is February 1.

Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. The department admits new students only in the fall semester.

### Financial Aid

Teaching assistantships, research assistantships and University fellowships are available to graduate students at the MA and PhD levels. Please refer to Graduate Fellowships and Assistantships for additional information.

### Requirements For The Degrees

All new students are required to take a non-credit one-hour pro-seminar.

### MA In Sociology

#### MA In Sociology With Thesis Option

SOCI 605 Data Collection

SOCI 612 Development of Sociological Theory

SOCI 606 Qualitative Methodology

or

SOCI 614 Advanced Data Analysis

or

EDUC 812 Regression Models in Education

or

EDUC 874 Multivariate Data Analysis in Education

or

EDUC 876 Structural Models in Education

or

## EDUC 873 Hierarchical Linear Modeling in Education

5 elective courses from at least two different substantive areas to assure breadth in substantive areas of Sociology

6 thesis credits

### MA In Sociology With Master's Examination

SOCI 605 Data Collection  
SOCI 612 Development of Sociological Theory  
SOCI 606 Qualitative Methodology  
or  
SOCI 614 Advanced Data Analysis  
or  
EDUC 812 Regression Models in Education  
or  
EDUC 874 Multivariate Data Analysis in Education  
or  
EDUC 876 Structural Models in Education  
or  
EDUC 873 Hierarchical Linear Modeling in Education  
SOCI 621 Deviance  
SOCI 626 Organizations  
SOCI 609 Stratification

3 elective courses

Comprehensive Exams in two areas

### MA In Sociology With An Internship And Analytic Paper

SOCI 605 Data Collection  
SOCI 612 Development of Sociological Theory  
SOCI 606 Qualitative Methodology  
or  
SOCI 614 Advanced Data Analysis  
or  
EDUC 812 Regression Models in Education  
or  
EDUC 874 Multivariate Data Analysis in Education  
or  
EDUC 876 Structural Models in Education  
or  
EDUC 873 Hierarchical Linear Modeling in Education  
SOCI 626 Organizations

3 elective courses selected with the advice of the Intern Director

Internship (6 credits)

## MA In Criminology

### Required Courses

SOCI 605 Data Collection  
SOCI 612 Development of Sociological Theory  
SOCI 606 Qualitative Methodology  
or  
SOCI 614 Advanced Data Analysis  
or  
EDUC 812 Regression Models in Education  
or  
EDUC 874 Multivariate Data Analysis in Education  
or  
EDUC 876 Structural Models in Education  
or  
EDUC 873 Hierarchical Linear Modeling in Education  
SOCI 835 Seminar in Criminal and Delinquent Behavior

9 credits from categories a and b below, with at least one course selected from each group:

a) Criminal and Deviant Behavior  
SOCI 628 Corporate/Government Deviance  
SOCI 621 Social Deviance  
SOCI 836 Seminar in Criminal and Delinquent Behavior  
SOCI 667 When topic is crime, deviance, law or social control  
b) Criminal Justice and Legal Systems  
SOCI 655 Law and Society  
UAPP 624 Seminar in Criminal Justice  
SOCI 6xx American Legal Systems

There are thesis, exam or internship options as in Sociology.

## PhD In Sociology

To permit maximum flexibility for developing an individualized PhD program, there are no minimum course hour requirements. However, six specific courses are required. The Graduate Policy Committee is responsible for approving course equivalents for courses taken elsewhere. Current requirements are as follows:

SOCI 605 Data Collection and Analysis  
SOCI 614 Advanced Data Analysis  
SOCI 606 Qualitative Methodology  
or  
SOCI 611 Techniques of Demographic Analysis  
EDUC 812 Regression Models in Education  
or  
EDUC 874 Multivariate Data Analysis in Education

or  
EDUC 876 Structural Models in Education  
or  
EDUC 873 Hierarchical Linear Modeling in Education  
SOC 612 Development of Sociological Theory  
SOC 813 Current Issues in Social Theory

A one-credit course in Teaching Techniques

4 elective courses (12 credits excluding independent studies)

Comprehensive Exams in two areas

SOCI 969 Dissertation (9 credits)

### PhD In Criminology

There is no minimum number of credit hours prescribed for the PhD in Criminology but students are required to take the following courses. The Graduate Policy Committee is responsible for approving course equivalents for courses taken elsewhere. Current requirements are as follows:

SOCI 605 Data Collection and Analysis  
SOC 614 Advanced Data Analysis  
SOC 606 Qualitative Methodology  
or  
SOC 611 Techniques of Demographic Analysis  
EDUC 812 Regression Models in Education  
or  
EDUC 874 Multivariate Data Analysis in Education  
or  
EDUC 876 Structural Models in Education  
or  
EDUC 873 Hierarchical Linear Modeling in Education

SOCI 612 Development of Sociological Theory  
SOC 835 and SOC 836  
Seminar in Criminal and Delinquent Behavior

4 courses (12 credits, excluding independent studies, from the courses listed in Parts a and b of the MA in Criminology program)

A one-credit course in Teaching Techniques

Comprehensive exam in Criminology and one additional area, except Social Deviance

SOCI 969 Dissertation (9 credits)

### Theatre (MFA)

Telephone: (302) 831-1894  
<http://www.pttp.udel.edu/>

Faculty Listing: <http://www.pttp.udel.edu/faculty.html>

### Program Overview

The Department of Theatre offers graduate study leading to a Master of Fine Arts degree with concentrations in acting, technical production, and stage management. The Professional Theatre Training Program (PTTP) involves intensive studio work designed to prepare students for creative careers in the professional theatre and thereby contribute to its growth and improve its quality.

Once every three years, after an extensive search conducted throughout the United States, a group of exceptionally talented students is selected for admission to the Professional Theatre Training Program in the Department of Theatre. Each student in the Professional Theatre Training Program participates in an intense curriculum in one of three concentrations (acting, stage management, or technical production) for three years. Each curriculum is carefully designed to provide the skills, abilities, and experiences necessary to begin a successful career in theatre. Students work exclusively within their area in an intensive program of studio classes and production experiences. Each curriculum is skill-oriented, emphasizing rigorous training in the craft areas appropriate to the specialization being pursued. All students in a curricular area participate in the same prescribed program of conservatory classes and continue working with one another throughout the three years of training. Because only one class is enrolled at a time, the faculty is able to focus its full energies on the development of each student. In all three years, students enjoy multiple production opportunities in classic plays as well as in a variety of other theatrical styles and genres. Although graduates find themselves well prepared for employment in many styles and mediums, the Program is specifically designed to train through plays from the classic repertoire and seeks students with a particular commitment to, and appetite for, the acknowledged masterworks of dramatic literature.

### Requirements For Admission

Students apply for admission to one of three curricular areas: Acting, Stage Management, or Technical Production. In order to be considered for an audition (Acting) or interview (Stage Management and Technical Production), students must have an undergraduate degree or equivalent theatre experience. Graduate Record

Examination (GRE) scores are not required. A statement of theatre experience equivalency will be submitted by the Department of Theatre to the Office of Graduate and Professional Education for those students who are recommended for admission without an undergraduate degree.

Prior to the audition/interview process, all students submit a program application, acquired from the Theatre Department, along with a resumé. Upon receipt of the program application and resumé, all students are scheduled for an audition/interview. There is no audition/interview fee. Applicants' talent and aptitude are evaluated via the audition/interview process conducted in cities throughout the United States.

Once students have completed the audition/interview process as described below, they must submit a University Graduate Application along with the \$60 non-refundable application fee in order to be considered for selection into the Program.

**Audition Process for Acting.** Applicants are requested to prepare two monologues of contrasting mood, one from a modern or contemporary play and one from a classic play in verse. The combined length of the two selections should not exceed four minutes. The audition process is conducted with groups of 10-15 applicants at a time. Each applicant presents her or his prepared selections, and participates in group exercises and improvisations in acting, voice, movement, and speech conducted by members of the acting faculty.

**Interview Process for Stage Management and Technical Production.** Applicants are required to interview. While an in-person interview is preferable and highly encouraged, a telephone interview is acceptable. Applicants are encouraged to bring to or send in advance of their interview any pertinent materials (e.g., production photographs, production books, renderings, draftings, and/or slides). Such materials can be submitted in digital or hard copy.

#### Financial Aid

The PTPP offers full fellowships and stipends based on need. Fellowships and stipends are automatically renewed while a student matriculates through the Program as long as the student meets the University's criteria for maintaining an award.

#### Requirements For The Degree

All candidates for the degree of Master of Fine Arts must be full-time participants of the Professional Theatre Training Program for three consecutive years and must complete the curricular requirements and specified credits in one of the three areas: Acting, Stage Management, or Technical Production. Specific academic policies may be obtained from the department. A minimum of 60 credits is required for the Master of Fine Arts degree. Degree requirements for each concentration follow.

#### Acting

The acting curriculum is an intensive three-year conservatory training program. Students follow an integrated curriculum in which all subjects are directly related and in which no course is optional. Students in acting are expected to develop technical proficiency in voice, speech, movement, and acting. The curriculum emphasizes frequent public performance in predominately classic plays produced in a wide variety of theatrical styles and genres, with continual studio work on the development of skill leading to artistry.

#### CREDITS

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 602	Voice Development IA (1 credit fall)	1
THEA 603	Voice Development IB (1 credit spring)	1
THEA 608	Stage Movement IA (1 credit fall)	1
THEA 609	Stage Movement IB (1 credit spring)	1
THEA 614	Stage Speech IA (2 credits fall)	2
THEA 615	Stage Speech IB (2 credits spring)	2
THEA 620	Rehearsal & Performance/ Acting (3 credits each semester)	6
THEA 621	Verse Speaking, Rhetoric, and Communication IA (fall)	1
THEA 622	Verse Speaking, Rhetoric, and Communication IB (spring)	1
THEA 665	Theatre Literacy (1 credits each semester)	2
<b>Total Year #1</b>		<b>22</b>

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 604	Voice Development IIA (1 credit fall)	1
THEA 605	Voice Development IIB (1 credit spring)	1
THEA 610	Stage Movement IIA (1 credit fall)	1
THEA 611	Stage Movement IIB (1 credit spring)	1
THEA 616	Stage Speech IIA (1 credit fall)	1
THEA 617	Stage Speech IIB (1 credit spring)	1
THEA 620	Rehearsal & Performance/Acting (3 credits each semester)	6
THEA 623	Verse Speaking, Rhetoric, and Communication IIA (fall)	1
THEA 624	Verse Speaking, Rhetoric, and Communication IIB (spring)	1
Total Year #2		18

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 606	Voice Development IIIA (1 credit fall)	1
THEA 607	Voice Development IIIB (1 credit spring)	1
THEA 612	Stage Movement IIIA (1 credit fall)	1
THEA 613	Stage Movement IIIB (1 credit spring)	1
THEA 618	Stage Speech IIIA (1 credit fall)	1
THEA 619	Stage Speech IIIB (1 credit spring)	1
THEA 620	Rehearsal & Performance/Acting (5 credits each semester)	10
Total Year #3		20
TOTAL GRADUATION CREDITS		60

Stage Management

The stage management curriculum is an intensive three-year conservatory training program. Students follow an integrated

curriculum in which all subjects are directly related and in which no course is optional. Students in stage management are expected to develop technical proficiency in professional rehearsal and performance practices and techniques, communication skills, technical theatre skills, and management skills. The curriculum emphasizes frequent public performance in predominately classic plays produced in a wide variety of theatrical styles and genres, with continual studio work on the development of skill leading to artistry.  
CREDITS

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 633	Stage Management Organizational and Managerial Techniques IA (fall)	2
THEA 634	Stage Management Organizational and Managerial Techniques IB (spring)	1
THEA 639	Stage Management Production Skills IA (fall)	2
THEA 640	Stage Management Production Skills IB (spring)	2
THEA 645	Rehearsal & Performance/Stage Management (2 credits each semester)	4
THEA 648	Costume Construction (spring)	1
THEA 665	Theatre Literacy (1 credit each semester)	2
THEA 680	Lighting Production (fall)	1
THEA 681	Audio Production (fall)	1
THEA 693	Production Seminar (fall)	1
Total Year #1		21

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 635	Stage Management Organizational and Managerial Techniques IIA (2 credits spring)	2
THEA 641	Stage Management Production Skills IIA (2 credits fall)	2

THEA 645	Rehearsal and Performance/ Stage Management (5 credits each semester)	10
THEA 674	Scenery Production (1 credit fall)	1
THEA 694	Special Topics in Theatre Production (2 credit fall)	2
Total Year #2		21

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 636	Stage Management Organizational and Managerial Techniques IIB (2 credits spring)	2
THEA 642	Stage Management Production Skills IIB (2 credits fall)	2
THEA 645	Rehearsal and Performance/ Stage Management (5 credits each semester)	10
Total Year #3		18

TOTAL GRADUATION CREDITS 60

#### Technical Production

The technical production curriculum is an intensive three-year conservatory training program. Students follow an integrated curriculum in which all subjects are directly related and in which no course is optional. Students in technical production are expected to develop technical proficiency in properties construction, audio production, scenic painting, stage carpentry, stage electronics, computerized drafting, and production management.

The curriculum emphasizes frequent public performance in predominately classic plays produced in a wide variety of theatrical styles and genres, with continual studio work on the development of skill leading to artistry.

#### CREDITS

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 665	Theatre Literacy (1 credit each semester)	2

THEA 674	Scenery Production (fall)	1
THEA 675	Properties Production (spring)	1
THEA 680	Lighting Production (fall)	1
THEA 681	Audio Production (spring)	1
THEA 684	Technical Production Seminar (spring)	1
THEA 685	Stage Rigging, Mechanics, & Automation I (spring)	1
THEA 686	Information Technologies for Theatre (fall)	1
THEA 687	Scenery Painting (spring)	1
THEA 688	CAD and Scenery Construction (spring)	1
THEA 692	Production and Performance/ Technical (2 credits fall, 3 credits spring)	5
THEA 693	Production Seminar (fall)	1
Total Year #1		21

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 676	Scenery: Metalworking (fall)	1
THEA 677	Properties Production II (fall)	1
THEA 683	Production Project Management (fall)	1
THEA 684	Technical Production Seminar (1 credit each semester)	2
THEA 689	Stage Rigging, Mechanics, and Automation II (fall)	1
THEA 692	Production and Performance/ Technical (4 credits each semester)	8
THEA 694	Special Topics in Theatre Production (3 credits spring)	3
Total Year #2		21

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice (1 credit each semester)	2
THEA 601	Dynamics (1 credit each semester)	2
THEA 684	Technical Production Seminar (1 credit each semester)	2
THEA 692	Production Preparation and Performance/Technical (6 credits each semester)	12
Total Year #3		18

TOTAL GRADUATION CREDITS 60

## Alfred Lerner College of Business and Economics

### Winterthur Program in American Material Culture (MA)

Telephone: (302) 831-2678

<http://www.udel.edu/winterthurprogram/>

Faculty Listing: <http://www.udel.edu/winterthurprogram/people.html>

#### Program Overview

The Winterthur Program in American Material Culture is a two year program leading to a Master of Arts. The Program provides a multidisciplinary approach to the study of American decorative arts and material culture. It is based on the assumption that a cultural approach to the American past and its artifacts is the best way to achieve an understanding of the American people. The Program is a cooperative effort of the Winterthur Museum and Country Estate and the University. Related areas are American fine and decorative arts, social and cultural history, literature, and museum studies. The method combines traditional concepts from the humanities with those of the social sciences that emphasize the importance of material culture as a nonverbal means of communication. Methods of research for analyzing both the material itself and contemporary documents are stressed, with courses at the University providing the cultural context for detailed examination of original objects at Winterthur. Other special facilities include research libraries at both institutions as well as slide and media centers.

#### Requirements For Admission

Students who are interested in graduate work in this field must apply for appointment as Winterthur Fellows. Application for admission must be made by applying through the Graduate Office at the University of Delaware. The deadline is January 15 for the complete application file of admissions credentials. The GRE General Test is required. Appointment as a Fellow includes financial support.

Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

#### Winterthur Fellowships

Graduate fellowships have been established

under the auspices of the Winterthur Museum and Country Estate and the University for study in the Winterthur Program in American Material Culture. All admitted students receive a fellowship which provides full tuition and an annual stipend. Application for the Program and these fellowships is done on line. Consult the Program's website ([www.udel.edu/winterthurprogram/](http://www.udel.edu/winterthurprogram/)) for current information.. In order to be considered, all application materials, including the GRE scores, must be received no later than January 15 of the year for which admission is desired. Admission is by fellowship only.

#### Requirements For The Degree

The Winterthur Program takes two years of full-time study to complete, beginning in July of the year of acceptance. The degree requires at least 42 course credit hours and includes a written thesis. No special examinations or language are required.

Core requirements. These begin in the summer of entrance with intensive training in the decorative arts with a focus on the Winterthur collection. Courses incorporate connoisseurship, research methods, and theoretical approaches to the study of American material life, spanning the 17th, 18th, 19th and 20th centuries. Extracurricular activities such as field trips add breadth and richness to the required coursework. Fellows participate in guide training and interpretation at the Museum.

Course distribution. Students gain breadth in understanding of American culture through University courses usually chosen from art history, history, and English. In addition to traditional courses, these departments also embrace such fields as folklore, vernacular architecture, and visual culture.

Optional curriculum. Students may choose further studies in the areas listed above or work in other departments of the University, such as geography, anthropology, or museum studies. In addition, Fellows who wish to receive museum certification may receive course credit for an internship taken at the Winterthur Museum.

Further information is available through the Director, Winterthur Program in American Material Culture.

## Alfred Lerner College of Business and Economics

The mission of the Alfred Lerner College of Business and Economics is to foster scholarship and to offer distinctive, innovative educational opportunities related to the successful management and leadership of organizations operating in an environment of scarce resources, rapid change, global competition, and advances in technology.

The Alfred Lerner College of Business and Economics offers graduate degrees in these disciplines: Accounting, Management Information Systems, Business Administration (MBA), Organizational Effectiveness, Finance, Economics, Economics Education, and Hospitality Information Management. The following dual master's degree programs are offered: MBA/MS: Accounting; MBA/MA: Economics; MBA/MS: Information Systems and Technology Management; MBA/MS: Organizational Effectiveness, Development and Change; MBA/MAS: Civil Engineering, MBA/Master of Civil Engineering; MBA/Master of Chemical Engineering; MBA/Master of Engineering: Mechanical; MBA/Master of Materials Science & Engineering; MBA/MS: Mechanical Engineering; MBA/MS: Electrical and Computer Engineering.

PhD Biological Sciences/MBA students must be actively and successfully pursuing the PhD in Biological Sciences before applying to the MBA.

An Executive MBA is offered at the University's Pennsylvania Avenue campus in Wilmington for experienced professionals. The Lerner College also offers a PhD in Economics.

The MBA program provides a highly select group of students with a relevant, advanced business management education. Coursework integrates the functional areas of business, while preparing graduates for positions of greater responsibility in corporations, small businesses, consulting firms, government, or non-profit organizations. All students are exposed to EDGE: Experiential Learning, Data-based Approach based on facts and academic research, Global Perspective, and issues of Ethical Leadership. Students have the option of choosing areas of concentration. Small class sizes and intense interaction among students of diverse backgrounds and experiences are hallmarks of the program. The Executive MBA program provides an intensive and accelerated format for individuals with a record of successful professional experience.

The objective of the MS in Accounting program is to extend the education of qualified students

into advanced study in each of the major areas of the field of accounting (financial, managerial, information systems, auditing, and taxation), as well as in the supporting fields of finance and quantitative methods. In taking students beyond the level of study offered by an undergraduate program in accounting, the MS provides additional preparation for careers in public accounting, industry, and government and establishes a foundation for further study at the PhD level in preparation for an academic career. The Lerner College also offers a dual degree MBA/MS in Accounting and a 4+1 MS Accounting Program.

The objective of the MS in Information Systems & Technology Management (IS &TM) is to produce students who possess the combination of management and technical skills needed to bring about the effective deployment and administration of information technology to achieve business success in today's highly competitive global environment. The Lerner College also offers a dual degree MBA/MS in IS &TM.

The objective of the MS in Organizational Effectiveness, Development and Change (OEDC) is to develop the necessary skills for our graduates to be effective agents of change in business and corporate organizations. The student will learn the theory, methods, techniques and skills to influence change and develop businesses to maximize effectiveness. The program is grounded in theory and empirical evidence, focused on critical and analytical thinking and methods of planning and implementing strategies in today's complex, dynamic and global business environment. The Lerner College also offers a dual degree MBA/MS in OEDC combining the specific focus of the MS in OEDC with the MBA degree. This allows students to prepare themselves to better understand the breadth of business disciplines with the focus in organizational development and change.

The purpose of the MS in Finance program is to provide students with the theoretical knowledge and practical skills to be innovative, well-informed, and experienced finance professionals. The curriculum is based on the financial theory and empirical methods employed by professionals practicing corporate finance, financial security valuation, financial modeling, portfolio management, financial services management, financial risk management, and corporate governance. In addition, students are expected to leverage the educational

opportunities afforded by the Exelon Trading Center and the Weinberg Center for Corporate Governance. As a result, students will obtain training and experience valued by corporations, financial service firms, consulting firms, and government agencies. Additionally, if desired, students may tailor their program to enhance progress through a subsequent doctoral degree program.

The MS in Economics and Applied Econometrics is focused on the application of analytical techniques and economic research in government and private industry. It is primarily oriented toward students pursuing a career in applied economics as well as providing an excellent foundation for further work in a PhD program. An MA option in economics is also available. The PhD in Economics builds upon the MS degree. This program develops quantitative skills required to conduct applied economic research. This program prepares graduates for careers in the public and private sectors as well as academia.

The objective of the MS in Hospitality Information Management is to develop students for successful careers as corporate hospitality information managers, consultants, and hospitality systems implementation professionals. The program offers high-quality, professional-level instruction for current hospitality managers seeking to further their education by applying technology solutions in operational settings. It is also designed to provide students interested in future doctoral work in hospitality and tourism management a sound foundation toward that goal.

The Lerner College also participates in the Operations Research Program. A description of that program can be found under Agriculture and Natural Resources. For more information, please visit the Lerner College website at: <http://www.lerner.udel.edu>.

### **Business Administration (MBA)**

Telephone: (302) 831-2221

<http://www.mba.udel.edu/>

Faculty Listing: <http://www.lerner.udel.edu/faculty-staff/business>

#### **Program Overview**

The University of Delaware Master of Business Administration (UD MBA) program is accredited by the AACSB International--The Association to Advance Collegiate Schools of Business. Students may pursue either a full-time or

part-time course of study in the UD MBA program. In some cases, UD MBA students with an undergraduate degree in business administration may waive some of the core classes and thereby complete the program with less than the 48 credits required of students with no prior academic background in business administration. The Executive MBA (EMBA) is a lock-step program, and EMBA students are not eligible for course waivers.

#### **Requirements for Admission**

Admission to the MBA program is highly selective and is based upon a combination of professional work experience, prior academic grades, Graduate Management Admissions Test (GMAT) scores, letters of recommendation, and an interview. Please refer to Graduate Admissions for more information. Applicants are required to provide a copy of their recent resume along with a completed application. Two letters of recommendation should be sent to the Office of Graduate and Professional Studies. For the Executive MBA program, one of these letters must be from the applicant's direct manager. The GMAT is not required for the Executive MBA; however, Executive MBA applicants must have a minimum of 5 years of professional work experience.

Students in the MBA program are admitted for initial enrollment in either the fall (August), spring (February), or summer (June) semesters. Admissions decisions are made on a rolling basis throughout the year. To expedite consideration for admission, applications should be submitted by February 1 for full-time applicants seeking financial aid, May 1 for applicants seeking fall admission (including Executive MBA applicants), and November 1 for applicants seeking spring admission. Admission decisions may be made after these dates if space is still available; however, students are strongly encouraged to apply early. An admission deposit of \$500 is required upon notification of admission to the Executive MBA.

Candidates for admission need not have majored in any specific undergraduate field; however, students entering the MBA program are assumed to possess basic skills in written and oral communication, mathematics (normally one year at the college level) and computer usage (word processing, spreadsheets, e-mail, internet, and research based on electronic scholarly resources). Students deficient in any of these areas are encouraged to enroll in appropriate credit and non-credit courses.

## Requirements for the Degree

Candidates for the UD MBA degree must complete 48 credit hours, divided into Business Core courses (24 hours), EDGE Core courses (12 hours), and elective courses (12 hours). The EMBA Committee specifies specialized courses beyond the core and required curriculum. The UD MBA committee specifies specialized courses beyond the core and required curriculum for the on-site UD MBA programs.

Full-time MBA students can normally complete the program in 21 months. Part-time students normally take from three to four years to earn their degrees. Students may accelerate their program by taking courses in the winter and summer. The accelerated full-time program may be completed in as few as 16 months, and the part-time program may be completed in less than 30 months. Executive MBA students earn their degrees in 19 months.

### Business Core Courses (24 hours):

ECON 503	Economic Analysis for Business Policy
ACCT 800	Financial Reporting and Analysis
ACCT 801	Management Control Systems and Information Technology
BUAD 831	Operations Management and Management Science
FINC 850	Financial Management
BUAD 870	Leadership and Organizational Behavior
BUAD 880	Marketing Management
BUAD 890	Corporate Strategy

### EDGE Core Courses (12 hours):

1. The Experiential Learning requirement may be met by taking at least one of the following courses:

BUAD 892	Case Study and Simulation Analysis
BUAD 899	Business Consulting Project
BUAD 843	Special Topics in Global Business (a study abroad course)
ENTR 860	High Technology Entrepreneurship

2. The Data-Based Learning requirement may be met by taking at least one of the following courses:

BUAD 820	Statistical Data Analysis for Business (required if the student has not taken statistics)
BUAD 881	Research Methods for Marketing Decisions

ECON 803	Applied Econometrics I
ECON 804	Applied Econometrics II

3. The Global Perspective requirement may be met by taking at least one of the following courses:

ACCT 883	International Accounting
BUAD 878	Leadership in International Business Cultures
BUAD 882	International Marketing Management
ECON 540	International Economics for Managers
FINC 853	International Financial Management

4. The Ethical Leadership requirement may be met by taking at least one of the following courses:

BUAD 840	Ethical Issues in Domestic and Global Business Environments (required if the student has not taken an ethics course)
BUAD 861	Ethical Leadership Development

These requirements may be substituted with prior approval of the MBA Program Manager.

### Elective Courses (12 hours):

Twelve hours of additional graduate level coursework must be chosen in Business Administration, Finance, Economics, Accounting, Museum Studies, or other areas appropriate to the student's concentration, specialization, and/or academic or professional interests.

### Concentrations and Specializations

Although not required, it is possible for students to obtain one or more of the following concentrations by choosing 9 hours of elective course work in a highly structured course of study: Finance, Healthcare Policy, Information Technology, International Business, Marketing, Entrepreneurship, Museum Leadership, and Management. Please see the MBA program web page at [www.mba.udel.edu](http://www.mba.udel.edu) for more details.

As an alternative to a highly structured concentration, a student has the option to build a program of study in consultation with their faculty advisor by choosing 9 hours of electives coursework in line with their professional interest under the option of Self-Directed Specialization. The Self-Directed Specialization option allows MBA students more flexibility in designing a specialization with a variety of MBA program electives or in conjunction with other degree programs in the University.

Examples of self-directed specialization include Operations Management, Accounting, Chemical Engineering, Sport Management, and Public Policy.

The remaining three hours of electives should be outside the area of concentration or specialization.

Students interested in a general-interest MBA need not pursue a concentration or specialization and may select electives from a wide variety of academic interests.

#### Course Waivers and Transfers

A total of up to 12 credits may be waived and/or transferred. Course waivers should be assessed upon application to the UD MBA program. It is possible to finish the UD MBA degree at an accelerated pace in one year with a minimum 36 credits with sufficient course waivers/transfers. Students entering the UD MBA program with a BS, BA, or equivalent degree from an AACSB-accredited school may substitute additional elective coursework for up to six credits from the EDGE core requirement. Thus, the students on this faster track will need to take a minimum of 36 credit hours instead of 48 hours. Course waivers are not allowed in the EMBA program.

Students in the UD MBA programs (part-time and full-time) may waive up to 12 credits of the 24 credits in Business core if they have completed two applicable courses in that subject area at the undergraduate level at an AACSB-accredited institution during the last five years with grades of B or better in each course; one of those two undergraduate courses must be at the intermediate level. Coursework from related graduate degrees may also qualify as the basis of a course waiver, but only in a related academic field. For instance, a student who already holds an MS in accounting from an AACSB-accredited institution may request a course waiver for ACCT 800; similarly, a holder of an MA in economics may request a course waiver for ECON 503.

It is possible to transfer graduate-level coursework to the UD MBA from other AACSB-accredited schools. A maximum of nine credits may be transferred. Graduate courses are eligible for transfer only if earned at a school fully accredited by the Association to Advance Collegiate Schools of Business International. Course transfers are not official until the student has completed at least nine credit hours as a

matriculated MBA student at the University of Delaware.

#### Dual Degrees

There are many dual degrees options with the MBA, including:

MBA/MA: Economics  
MBA/MS: Information Systems & Technology Management  
MBA/MS: Organizational Effectiveness Development & Change  
MBA/MS: Mechanical Engineering  
MBA/MS: Electrical and Computer Engineering  
MBA/MAS: Civil Engineering  
MBA/Master of Civil Engineering  
MBA/Master of Chemical Engineering  
MBA/ME: Mechanical  
MBA/Master of Materials Science & Engineering  
PhD Biological Sciences/MBA  
MD/MBA (in collaboration with Thomas Jefferson University – Jefferson Medical College)

Most dual degrees generally require at least 60 graduate credits and follow a very structured curriculum.

A dual degree requires 30 credits in the MBA curriculum. The 30 credits for MBA will consist of 24 credits of the Business core requirements plus six credits of the EDGE core requirements. The remaining six credits of the EDGE core may be met by the courses taken for the other degree being pursued along with MBA. Students interested in pursuing a dual degree should contact the MBA Program Manager to discuss the specific courses required to complete the degrees.

#### Electronic Communications Requirement

All MBA students are provided with electronic addresses and e-mailboxes and are expected to utilize email, the Internet, and electronic scholarly resources on a regular basis. The UD MBA program provides basic instruction in electronic communications for new students. Other instruction is available in short, non-credit classes that are offered by the University, Information Technologies staff, and the business reference librarian at Morris Library. Students wishing to use their private e-mail MUST forward their University e-mail accounts to this address. Electronic mail is the primary method of administrative information dissemination, and students are responsible for monitoring their University e-mail accounts. Accounting and Management Information Systems (MS)

## **Accounting and Management Information Systems**

Telephone: (302) 831-2961

<http://www.lerner.udel.edu/accounting>

Faculty Listing: <http://www.lerner.udel.edu/faculty-staff/acctmis>

### **MS In Accounting And MS In Information Systems & Technology Management**

#### **Program Overview**

The Department of Accounting and Management Information Systems offers programs leading to the Master of Science degree with a major in Accounting, including a 4 + 1 option, and a Master of Science degree with a major in Information Systems & Technology Management (IS &TM). The objective of the MS in Accounting is to extend the education of qualified students into advanced study in each of the major areas of the field of accounting and information systems, as well as in the supporting fields of finance and quantitative methods. In taking the student beyond the level of study offered by an undergraduate program in accounting, the MS provides additional preparation for careers in public accounting, industry, and government, and establishes a foundation for further study at the PhD level in preparation for an academic career.

The objective of the 4 + 1 option is to provide an efficient solution to accounting students now facing 150 credit hour requirements (in most states) to sit for the CPA exam and/or to become certified. The 4 + 1 program gives students an opportunity to obtain these credit hours through graduate study of accounting.

The objective of the MS in IS &TM is to produce students who possess the combination of management and technical skills needed to bring about the effective deployment and administration of information technology to achieve business success in today's highly competitive global environment. Because of the combination, the MS in IS &TM is primarily designed for two types of students: those with a background in business who want to move into a more technology-oriented role in their organization, and those with a background in a technical field who want to move into an IT/management role in their organization. Examples of the type of students with technical background we attract include engineers, scientists, and those involved in biotechnology.

Students in the MS in Accounting may pursue

either a full-time or a part-time course of study. Full-time students with an undergraduate accounting major from an accredited AACSB college should be able to complete the program within one calendar year. The MS in IS &TM is a part-time course of study, and students are expected to complete this degree program within two calendar years.

#### **Requirements For Admission**

Applicants must supply all information stated in the Graduate Admissions section.

Admission to these graduate programs is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

Candidates for admission are invited to correspond with the Director of the MS program. Detailed brochures on these MS programs, including the 4 + 1 option, are available. As part of the admissions process for the MS in IS &TM, each student will meet with a faculty advisor who will evaluate the student's background in both business and programming (including prior coursework and experience). Foundation course requirements will be based on this evaluation.

#### **Requirements For The Degree**

The MS in Accounting requires 30 hours of graduate credit which includes fifteen credits of required accounting, three credit hours of business ethics, three credits of business statistics and nine credit hours of graduate electives.

The MS program has as prerequisites the equivalent of four accounting courses required for an undergraduate accounting major as well as completion of courses meeting Association to Advance Collegiate Schools of Business (AACSB) common body of knowledge requirements. The MS is designed as a one-year, 30-hour graduate program beyond these prerequisites. Students admitted to the program without these prerequisites may complete this work while in the MS program. Normally, those holding an undergraduate business degree from an accredited AACSB college will have met the common body of knowledge requirements outside the area of accounting.

Graduate-level courses taken to fulfill the AACSB common body of knowledge will not count towards fulfilling the 30-hour requirement for the MS in Accounting.

The 4 + 1 MS Accounting Program permits students to take graduate classes as part of their academic studies. Normally, this process begins at the conclusion of the student's junior year. The total credit hours for the combined BS/MS degree is 150 hours, i.e., the same as it would be if students took the two degrees separately. Undergraduate course requirements are the same as they are now, with this exception: Accounting and Finance graduate courses required for the MS portion can be used to satisfy the Class F electives (FINC and ACCT) required for the undergraduate portion. Students that utilize this option to obtain the needed 150 credit hours, will complete six additional credit hours, classified as Class G "other electives." These credit hours can be satisfied with any undergraduate business or non-business course. Total graduate level course requirements are the same as for the MS in Accounting degree. These requirements include 30 credit hours of coursework at the 600 or 800 level. Students in the 4+1 program are permitted to take up to 6 credit hours of independent study. Additional independent study does not count toward graduation.

## **Organizational Effectiveness, Development and Change (MS) (Dual Degree MBA/MS)**

Business Administration

Telephone: (302) 831-2554

<http://www.lerner.udel.edu/programs/graduate/oedc>

Faculty Listing: <http://www.lerner.udel.edu/departments/graduate/oedc/facadvisoryboard>

MS In Organizational Effectiveness, Development and Change

### Program Overview

The purpose of the MS in Organizational Effectiveness, Development and Change (OEDC) is to develop the necessary skills to be an effective agent of change in business and organizations. The student will learn the theory, methods, techniques, and skills to influence change and develop business to maximize effectiveness. The program is grounded in theory and empirical evidence, focused on critical and analytical thinking and methods of planning and implementing strategies in today's complex,

dynamic and global business environment.

The majority of students are expected to be mid-career professionals in business and corporate functions. Most students are expected to have had some supervisory experience and to be preparing for positions in increasingly responsible middle to upper management and leadership. Additionally, some students may be preparing for careers as internal or external organizational consultants or for doctoral level studies in management or organizational behavior. Students preparing for doctoral work should take a research focus with thesis option.

Middle and upper management focuses on planning and implementing policies and programs to accomplish strategic goals within the firm. As such our program focuses on translating strategic goals into operational plans and working with and through people to get those plans adopted and implemented. Personal development focuses on formation of the self as change agent. The change process depends on working with and through others, thus there is a heavy emphasis on leadership, influence, interpersonal, team and intergroup collaboration skills.

We believe that the best practitioners of organizational development and change are those with a thorough understanding of the science of management and human behavior. We are strongly committed to the scientist-practitioner model. This means that effective practitioners must have a deep understanding of the theory and empirical evidence that provides the basis for their practice. They must also be scientist, in that they must be able to test their models and applications through the practice of evidence based management. Thus we expect our students to develop critical thinking and analytical skills to understand, apply and test models of management, organizational development and change practices.

### Requirements for Admission

Qualified applicants for MS admission must:

- Hold the equivalent of a 4-year U.S. Bachelor's Degree from an accredited college or university.
- Submit a Graduate Admission Application and official transcripts of all previous academic work.
- Submit official Graduate Records Examination (GRE) or the Graduate Management Admissions Test (GMAT). Scores in excess of the 50th percentile on each part of the exam are preferred.

- Submit Application Essays and Resume.
- Submit two letters of recommendation from faculty and/or employers.

Pre-admission interviews may be scheduled for qualified applicants on a case-by-case basis.

Students whose native language is not English also must submit the results of the Test of English as a Foreign Language (TOEFL). A minimum score on the TOEFL is required and scores in excess of 100 on the IBT form are preferred. This requirement may be waived if the student has earned a degree from an accredited educational institution in which English is the primary instructional language. Foreign applicants should also see the international student document requirements at the Office of Graduate and Professional Education Web

<http://www.udel.edu/gradoffice/apply/>

Admission decisions are based upon a number of factors, including:

- Undergraduate grade point index
- GMAT or GRE scores
- Previous graduate study
- Work experience
- 2 Letters of recommendation
- Application essays: What are your vocational objectives and how will your proposed plan of graduate study relate to them? Describe a particularly challenging experience, and how you handled that experience. Are there any special circumstances related to your academic record that you think we should consider?

Interview

Students may apply and be admitted on a part- or a full-time basis.

Candidates for admission need not have majored in any specific undergraduate field; however, students are assumed to possess basic skills in written and oral communication, mathematics (normally one year of at least pre-calculus at the college level), and computer usage. Students deficient in any of these areas may be advised to enroll in appropriate courses to improve their skills.

Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

Applications from those who wish to be considered for financial aid must be submitted by February 1. Early application submission is strongly encouraged although MS program admissions occur on a rolling basis. However, for optimal consideration, part-time students should submit applications by May 1 for Fall Semester admission, and by November 1 for Spring Semester admission. International applicants should apply at least one month earlier to allow time for visa processing.

Note: Applications can be submitted before taking the GRE or GMAT. Indicate on your application the scheduled date of your GRE or GMAT exam. However, late exam submission will delay application processing and the admission decision.

Every Applicant who has accepted admission must submit a \$300 non-refundable deposit by the deadline stated in the acceptance letter to secure a place in the MS in OEDC Program. Requirements for the Degree

The MS program is a 36 credit program with 24 credits of required coursework, 6-credits of required Professional Project or thesis, and 6 credits of electives. The curriculum is scheduled to accommodate the working professional with most courses in the evenings. Students using the program for professional development should conduct the professional project. Students who may be using our program as a stepping stone toward PhD admissions should take statistics or research methods courses for their electives and should complete the research thesis. Students must follow the prerequisites listed in the university catalog in planning the order in which to take courses. BUAD 870 is a prerequisite for many of the courses in the program, so it must be taken early in the program.

Program Requirements:

BUAD 800	Strategic Thinking for the Executive Leader	3
BUAD 820	Data Analysis and Quality Management	3
BUAD 840	Ethical Issues in Domestic and Global Environments	3
BUAD 870	Understanding People in Organizations	3
BUAD 872	Organizational Development and Change	3
BUAD 875	Strategic Human Resources	3
BUAD 877	Skills for Change Agents	3
BUAD 878	Leadership in International Business Cultures	3

Total Required Course Credits	24
Electives (see below)	6
BUAD 898 Professional Project or BUAD 869 Thesis	6
<b>TOTAL PROGRAM CREDITS</b>	<b>36</b>

Six credits of elective course selection should be made under consultation with the Program Advisor. Students planning to go on for a PhD degree should elect additional research methods or statistics courses. Students in a human resource/management development role may want to elect courses on adult education and technology in the School of Education. Students interested in increasing their general business acumen may elect accounting, finance or economics courses. The Program Advisor will review the student's academic background and career objectives in considering any variance to the program on an individual case basis.

#### Sample Electives - Select 6 credits

Other courses may be added to meet individual student's needs.

#### CourseCredits

ACCT 800	Financial Reporting and Analysis	3
BUAD 831	Operations Management and Management Science	3
BUAD 890	Strategic Management	3
BUAD 871	Managing for Creativity and Innovation	3
ECON 503	Economic Analysis for Business Policy	3
EDUC 670	Program Design and Instructional Strategies for Adults	3
EDUC 883	Administration of Adult and Continuing Education Programs	3
EDUC 818	Educational Technology Foundations	3
EDUC 885	Educational Technology Topics	3
EDUC 685	Multimedia Literacy	3
FINC 850	Financial Management	3
SOCI 606	Qualitative Methods	3
EVAL 755	Evaluation Models and Approaches	3
EVAL 756	Advanced Seminar in Evaluation	3

#### Professional Project or Thesis Option

Students should choose the professional project or thesis option by the time they complete 15 credits in the program. Because the thesis option

should be combined with research methods and/or statistics electives, it is unlikely that students would switch to the thesis option late in the program. Students may switch from the thesis to professional project option, however credits taken in the thesis cannot count toward the professional project and professional project credits cannot count toward the thesis. Students will declare their option with the program advisor and should discuss any changes in advance with the program advisor.

**Professional Project Option.** The professional project is intended to demonstrate proficiency in implementing organizational change through design, conduct and evaluation of an organizational change project in an organizational setting. Students electing the professional project option must identify their own site in which to conduct the professional project. Faculty will work with the student to identify and specify the professional project, but it is ultimately the student's responsibility to identify the site for the professional project. The second reader is normally a professional in the project site. The culmination of the project will be a written and oral presentation to be scheduled in coordination with the professional project supervisor and will be open to other faculty and students in the program. The grade for the Professional Project is assigned in the semester the project is completed.

**Thesis Option.** Students who elect to write a research thesis must identify a faculty member who is willing to supervise the thesis. A second reader will be selected in collaboration with the thesis supervisor. The research thesis will be a scientific study of a topic related to the degree. The grade will be assigned in the semester in which the thesis is completed. The thesis must be presented in a departmental research colloquium and a version of the thesis appropriate for publication in an appropriate research journal must be prepared. The dates for completion of the thesis follow the University of Delaware guidelines for graduation.

#### Comprehensive Examination

**Purpose:** To assess the students' mastery and integration of key concepts across the curriculum.

**Composition:** Students will write responses to several questions prepared by faculty teaching in the program. Questions are designed to assess skills in each competency area identified by the program faculty.

**Timing:**The exam will be administered twice annually (at the beginning of the spring and fall semesters). Students should plan to take the exam upon completing the required courses for the program. Students must pass the comprehensive exam prior to defending their Professional Project or thesis.

**Grading:**The exam will be graded by the faculty providing the questions. The exam is graded pass/fail. The Program Director will combine the feedback, submit the result to the Graduate Office, and provide feedback to the student on any areas they need to improve. Students failing the exam will have one chance to retake the exam. Students failing both settings will be recommended for dismissal from the program for failure to advance.

### Program Administration

The Faculty Program Director serves initially as the advisor for all new students. Students electing the thesis option must obtain the advisement of a program faculty member whose research expertise is most in line with the student's thesis research topic.

Up to nine semester hours of graduate credit earned prior to matriculation into the MS program or at another institution and not previously counted toward another degree may be accepted toward the University of Delaware MS degree. The course(s) must have been completed:

- with grades of B or better
- within five years of the effective date of the requested transfer

Normally, those credits will become eligible for transfer only after the candidate has completed at least nine credit hours as a matriculated MS Program student at the University of Delaware. To begin the process, the student must submit to the Program Advisor a written request for credit evaluation with course descriptions and syllabi of courses to be considered for transfer. Courses transferred from other universities count for credits but do not affect the program grade point average.

A graduate student must maintain a minimum 3.0 grade point index to remain a student in good standing and earn a 3.0 average in all required courses to be eligible for the MS degree. No grade below a C- may be counted toward the course requirements for the degree.

All examinations, thesis and professional project reports and oral presentations are in English. Proficiency in both written and oral English is required for progress and completion of the MS program.

Normally part-time students will complete 6 credits per semester and can complete the program in just over 2 years. Full-time students generally take 9 -12 credits per semester. Students must complete their degree within the five-year time limit established by the University. The Office of Graduate and Professional Education provides guidelines governing possible extensions in cases of special or extenuating circumstances.

Students must maintain continuous enrollment in every regular semester (fall and spring) throughout their program. This can be accomplished by registering for thesis or professional project credit during the time the thesis or project is underway, or by registering for sustaining status. See the university policy on sustaining status at <http://www.udel.edu/gradoffice/polproc>.

## **MBA/MS In Organizational Effectiveness, Development And Change Dual Degree Program**

### Program Overview

The MBA/MS in OEDC dual degree combines a subset of the required courses in the MS with the MBA program allowing students to combine the broader MBA degree with the focused training of the MS in OEDC. This program is jointly administered by the Alfred Lerner College of Business and Economics Graduate and Executive Programs office and the Department of Business Administration.

We believe that the best practitioners of organizational development and change are those with a thorough understanding of the science of management and human behavior. We are strongly committed to the scientist-practitioner model. This means that effective practitioners must have a deep understanding of the theory and empirical evidence that provides the basis for their practice. They must also be scientists, in that they must be able to test their models and applications through the practice of evidence based management. Thus we expect our students to develop critical thinking and analytical skills to understand, apply and test models of management, organizational

development and change practices.

### Requirements for Admission

Students desiring to pursue the dual MBA/MS in OEDC must apply directly to the degree program and must meet the admissions requirements of both the MBA and MS in OEDC programs. The admissions directors for each program will evaluate the application separately and will apply the same criteria as specified in their respective programs. The prospective student is encouraged to see the admissions policies for both programs in the graduate catalog. Whereas the MS in OEDC program accepts both the GMAT and GRE exams, scores for the GMAT are required by the MBA program. Applications and letters of recommendation are to be submitted to:

Office of Graduate and Professional Education  
 (<http://www.udel.edu/gradoffice/applicants/>) or  
 via mail at:  
 234 HULLIHEN HALL  
 UNIVERSITY OF DELAWARE  
 NEWARK, DELAWARE 19716 U.S.A.

The MBA/MS in OEDC is a dual degree program. As such, both programs must be completed and the dual degree is conferred simultaneously. Students admitted to the MBA/MS joint degree program who later decide they only want to complete one of the degrees must apply separately to the desired program for admission as a candidate in that program. Students who complete the single degree (MBA or MS in OEDC) may not at a later date be admitted to the dual degree program. In such case the student would be required to complete all requirements for the second degree. A student who is initially admitted to either degree and who decides to pursue the dual degree must apply for change of degree to the MBA/MS dual degree prior to receiving the first degree and must complete the requirements for the dual degree prior to any degree being granted.

### Requirements for the Dual Degree

The MBA/MS in OEDC program combines the required courses for the MBA program with the additional required courses of the MS in OEDC program. The MBA core and required courses make up 30 credits of the program. An additional 21 credits of courses from the MS in OEDC, including 6 credits of thesis or professional project are required. The total 60 credit program is completed with the addition of 9 elective

credits (see table below).

### Program Requirements:

MBA Core and Required Courses**		
ECON 503	Economic Analysis for Business Policy	3
ACCT 800	Financial Reporting and Analysis	3
FINC 850	Financial Management	3
ACCT 801	Management Control Systems	3
BUAD 820	Data Analysis and Quality Management*	3
BUAD 831	Operations Mgmt and Management Science	3
BUAD 840	Ethical Issues in Domestic & Global Business*	3
BUAD 870	Understanding People in Organizations*	3
BUAD 880	Marketing Management	3
BUAD 890	Corporate Strategy	3
MS Required Courses**		
BUAD 800	Strategic Thinking for the Executive Leader	3
BUAD 872	Organizational Development & Change	3
BUAD 875	Strategic Human Resources	3
BUAD 877	Skills for Change Agents	3
BUAD 878	Leadership in International Business Cultures	3
BUAD 869 or BUAD 868		
	Thesis or Professional Project	6
Total Required Course Credits		51

Electives 9  
 Electives may be taken from either the MBA program or from recommended electives in the MS in OEDC program. Students choosing the Thesis option should take additional statistics or research methods courses to support the Thesis research.

**TOTAL DUAL DEGREE CREDITS 60**

\* Serves both MBA and MS program required courses.

\*\* Required courses cannot count toward a concentration or specialization in the MBA program.

MBA/MS in OEDC students must complete a Professional Project or Thesis and complete the comprehensive examination under the same rules as apply to the MS in OEDC students. Students are encouraged to review the MS in OEDC Program Policy Statement for rules and

guidelines for the Professional Project, Thesis, and comprehensive examination.

Students may apply for the MBA/MS in OEDC on either a part-time or full-time basis. Full-time students are expected to complete the program in two years. Part-time students are expected to complete the program in approximately four years.

Transfers of coursework earned elsewhere, and waivers of courses are allowable under the same provisions as the MBA and MS in OEDC programs separately except that none of the coursework specific to the MS program may be waived on the basis of undergraduate coursework. Dual degree students must complete a minimum of 60 credits of coursework at the graduate level.

Students must maintain continuous enrollment in every regular semester (fall and spring) throughout their program unless by approved leave of absence. This can be accomplished by registering for thesis or professional project credit during the time the thesis or project is underway, or by registering for sustaining status.

See the catalogue for the university policy on sustaining status at <http://www.udel.edu/gradoffice/polproc>, and regarding Leave of absence at <http://www.udel.edu/gradoffice/polproc>.

Students in the MBA/MS in OEDC program may compete for the same sources of financial assistance as available to MBA or MS students. See the MBA program or MS in OEDC policy statements for specifics.

### **Economics (MA, PhD) Economics and Applied Econometrics (MS), Economic Education (PhD), (Dual Degree MBA/MA)**

Telephone: (302) 831-2565

<http://www.lerner.udel.edu/economics>

Faculty Listing: <http://www.lerner.udel.edu/faculty-staff/economics>

MA and PhD in Economics, MS in Economics and Applied Econometrics, MA in Economics and Entrepreneurship for Educators, PhD in Economic Education, and Dual MA in Economics/MBA

#### Program Overview

The Department of Economics offers programs leading to PhD, MA, and MS degrees in

Economics, and combined MA/MBA degrees. In addition, the Department offers a Master of Arts in Economics and Entrepreneurship for Educators and an MA and PhD in Economic Education. The PhD, MA, and MS programs emphasize applied economics with areas of specialization including econometrics, international economics and development, industrial organization, labor economics, applied macroeconomics, public economics, financial economics, environmental economics, and regional economic development. The MA/MBA program combines applied economics with traditional MBA skills. The MA and PhD in Economic Education are designed to train professionals in the field of economic education.

The curricula provide students with a balance between a core of microeconomic, macroeconomic, and econometric theory and a wide variety of applied courses. These programs are designed to prepare individuals for professional careers involving the application of economic analysis in both the public and private sectors, including academia.

The MA program in Economics and Entrepreneurship for Educators is designed to provide secondary and primary school teachers with both a foundation in economic theory and a set of strategies and methods for teaching economics in secondary and elementary schools. The program is designed to train teachers who have been identified as exceptional teachers in their region. Graduates of the program are expected to provide economic education leadership in their state and region.

#### Requirements for Admission

Prospective students should consult the Graduate Admissions chapter of this catalog for admission procedures. The dates for application submission are July 1 for Fall admission. Students seeking financial aid should complete their applications by February 15. Admission to graduate programs in the Department of Economics is selective and competitive based on the number of well-qualified applicants and available capacity. Those who meet stated minimum academic requirements are not guaranteed admission; nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths.

Dual Master of Arts in Economics and Master of Business Administration Degree. Applicants are expected to have at least a 3.0 (on a 4-point

scale) undergraduate grade-point. In addition, applicants should have a combined score of at least 1050 (verbal plus quantitative only) on the Graduate Record Examination Aptitude Test or score at or above the 55th percentile in the Graduate Management Admission Test. Foreign students must achieve a score of at least 90 on the IBT version of the TOEFL. While graduate courses do not require extensive prerequisites, students must have an adequate background in economics, calculus, and statistics. Applicants for the MBA/MA dual degree must also meet the MBA program admission criteria.

**Master of Arts in Economics and Entrepreneurship for Educators.** The program is open to educators who: (1) meet admission requirements of the Office of Graduate and Professional Education of the University of Delaware (official transcripts of all undergraduate work are required), (2) have completed a minimum of three semester hours in economics, (3) hold a current teaching certificate and have a minimum of three years of experience, and (4) are nominated by the Council or Center Director for Economic Education in their geographic region.

**Master of Science in Economics and Applied Econometrics and PhD in Economics Degree.** For admission to these programs, students must have demonstrated a high level of potential to do independent research at the doctoral level. Students are expected to score at least 1100 on the combined verbal and quantitative portions of the GRE exam or the equivalent on the GMAT. In cases where English is a second language, applicants are expected to score at least 100 on the IBT version of the TOEFL exam. A grade point average of at least 3.5 in economics courses is expected with emphasis placed on core courses and on course selection. Attention will also be given to courses that the applicant has taken in related disciplines. All applicants must submit at least three letters of recommendation from economics faculty who can comment explicitly upon the applicant's ability to do graduate-level work. Students seeking admission to the PhD program must also demonstrate a high level of potential to do independent research. Continuation in the PhD program requires a M.S. in Economics and Applied Econometrics from the University of Delaware, or Master's Equivalency, as determined by the Department's Graduate Committee. An MBA degree is not considered to be equivalent to a master's degree in economics. Each student's requirements for satisfying the master's equivalency will be established by the Graduate Committee.

Qualified applicants who have not met the Master's Equivalency requirement at the time of admission are required to do so while at the University of Delaware in order to continue in the PhD program.

**Master of Arts and PhD in Economic Education.** Students will be admitted to the program based upon enrollment availability and their ability to meet with following minimum recommended entrance requirements: Baccalaureate degree from an accredited college or university; GRE score of at least 1100 on math and verbal sections combined; an undergraduate GPA of 3.0 or higher; an officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (IBT), (alternately, applicants may submit scores from the IELTS test; a minimum score of 7.0 is required); and a written statement of goals and objectives, including a statement that clearly identifies the applicant's interest in the program. Coursework in microeconomics and macroeconomics at the intermediate level or above and in statistics and mathematics (calculus) is expected. Otherwise, qualified students who lack this background may be directed to appropriate coursework to remedy this deficiency. Continuation in the PhD in Economic Education requires a M.S. in Economic Education from the University of Delaware, or its equivalent, as determined by the Graduate Committee.

#### Requirements for Degrees

All degrees except the MA degree for teachers require a written comprehensive examination and completion of a capstone experience. Students may satisfy some elective course requirements for all degrees with a variety of graduate-level courses from other disciplines.

**Master of Arts.** The MA degree requires 30 credit hours of graduate work, nine of which are in three required courses: microeconomics, macroeconomics, and econometric theory. Students must also demonstrate a capacity for economic research by completing a 6-credit thesis or a 3-credit research project.

**Master of Arts in Economics and Entrepreneurship for Educators.** The MA degree requires 30 credit hours of graduate work, 18 of which are in five required areas: microeconomics, macroeconomics, monetary and international trade theories, contemporary economic issues, and curriculum strategies. In addition, candidates must design and implement an economic education program. A public policy

or research paper is also required.

**Master of Science in Economics and Applied Econometrics.** The MS degree requires 30 credit hours of graduate work, 18 of which are in six required courses: Microeconomic theory, Macroeconomic theory, three Econometrics courses, and a capstone research experience (research project or research-oriented advanced topics course).

**Dual Master of Arts and Master of Business Administration.** The MA/MBA degree requires 57 credit hours of graduate work in economics and business. Students must meet the core requirements for both the MA and MBA programs. By allowing elective courses to count for both programs, the combined MA/MBA degree represents a significant savings over taking two separate degrees.

**Doctor of Philosophy in Economics.** Doctoral students must complete 20 credits of approved graduate courses and a 9-credit thesis in addition to the requirements of the M.S. in Economics and Applied Econometrics or the MS Equivalency. Students must pass preliminary exams in Microeconomic and Macroeconomic theory and a field exam in a major field of study. Students choose a thesis committee consisting of a thesis adviser, two additional faculty members from the Department of Economics, and a faculty member whose primary appointment is in a department other than Economics. To be considered a doctoral candidate, a student must successfully defend a proposal outlining the nature of the work to be done for the dissertation. The dissertation must represent a significant advance in the body of economic knowledge and must be defended before the student's dissertation committee and the University Community.

**Master of Arts in Economic Education.** The MA degree requires completion of 31-34 credits and includes required courses in both Education and Economics. Students must pass examinations in Economics, including mathematical proficiency, Microeconomic Theory, and Macroeconomic Theory, and an examination in Education based on the first year Education Proseminar courses. No students will be admitted directly into the MA program in Economic Education. It is intended 1) to provide an appropriate exit degree for students who are unable to complete the PhD in Economic Education for extenuating personal reasons and 2) as a requirement for continuation in the PhD program.

**Doctor of Philosophy in Economic Education.** The Doctor of Philosophy in Economic Education requires an MA in Economic Education from the University of Delaware or Masters Equivalency plus 23 credits of graduate-level coursework and 9 credits of dissertation. Students must pass a comprehensive field exam in Economic Education. The dissertation committee shall include three University faculty from the Department of Economics and the School of Education, with at least one member from each unit, and a fourth member from outside of the program. To be considered a doctoral candidate, a student must successfully defend a proposal outlining the nature of the work to be done for the dissertation. The dissertation must represent a significant advance in the body of economic knowledge and must be defended before the student's dissertation committee and the University Community.

### **Finance (MS)**

Telephone: (302) 831-1484

<http://www.lerner.udel.edu/departments/finance>

Faculty Listing: <http://www.lerner.udel.edu/faculty-staff/finance>

#### **Program Overview**

The purpose of the MS Finance program is to provide students with the theoretical knowledge and practical skills to be innovative, well-informed, and experienced finance professionals. The curriculum is based on the financial theory and empirical methods employed by professionals practicing corporate finance, financial security valuation, financial modeling, portfolio management, financial services management, financial risk management, and corporate governance. In addition, students are expected to leverage the educational opportunities afforded by the Exelon Trading Center and the Weinberg Center for Corporate Governance. As a result, students will obtain training and experience valued by corporations, financial service firms, consulting firms, and government agencies. Additionally, if desired, students may tailor their program to enhance progress through a subsequent doctoral degree program.

The 30-credit degree program may be completed in nine months by a full-time student, admitted in the fall semester with a strong background in finance.

For further details contact the MS Finance Program Director ([msf@lerner.udel.edu](mailto:msf@lerner.udel.edu)).

## Requirements for Admission

Candidates for admission need not have majored in any specific field, but they will be expected to possess:

Strong written and oral communication skills.  
An understanding of finance and accounting concepts as presented in FINC 850 Financial Management and ACCT 800 Financial Reporting and Analysis.

Basic computer skills equivalent to MISY 160 Business Computing: Tool and Concepts

Mathematical skills equivalent to MATH 221 Calculus and MATH 230 Finite Mathematics with Applications.

Students deficient in any of the admission requirements may be admitted on conditional status and required to complete prerequisite non-degree coursework.

Admission to the program is selective and competitive. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. The following should be considered the minimum requirements for consideration for admission:

Comply with all of the requirements in the Graduate Admissions section of this catalog.

Earn a minimum combined verbal and quantitative score of 1050 on the GRE or at or above the 55 percentile on the GMAT.

Have a minimum overall undergraduate GPA of 3.0 (out of 4.0)

Hold the equivalent of a 4-year U.S. Bachelor's degree from an accredited college or university

Submit official transcripts of all previous academic work

Submit three (3) letters of recommendation

Submit a resume and application essay on the following topic:

What are your career objectives and how will an MS Finance degree help you achieve your goals?

Students whose native language is not English must achieve either a minimum score of 100 on the Test of English as a Foreign Language (TOEFL-IBT) or 7.5 on the International English Language Testing System (IELTS). This requirement may be waived if the student has earned a degree from an accredited educational institution in a country where English is the primary language and instruction was in English.

See Graduate Admissions for additional information, particularly for application procedures and deadlines.

## Requirements for the Degree

The MS Finance requires a minimum of 30 credits.

### Required Courses:

FINC 870	Theory of Financial Decision Making	3
FINC 871	Workshop in Finance: Seminar	3
FINC 872	Workshop in Finance: Empirical Research	3

ECON 803	Applied Econometrics I	3
ACCT 820	Financial Statement Analysis	3

FINC 851	Corporate Financial Analysis	3
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or		
FINC 861	Financial Modeling and Valuation	
FINC 852	Investment Analysis and Portfolio Management	3

or		
FINC 856	Financial Engineering and Risk Management	3

FINC 855	Financial Institutions and Markets	3
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Elective Courses 6

Elective Courses can be any 800-level FINC, ACCT, ECON, STAT, FREC or MATH course or 800-level BUAD study abroad courses. Students are not limited to these courses and, with the approval of the program director, other graduate courses can be used to satisfy elective requirements.

## Hotel, Restaurant and Institutional Management (MS)

Telephone: (302) 831-6077

<http://www.lerner.udel.edu/departments/hrim/grad/overview>

Faculty Listing: <http://www.lerner.udel.edu/faculty-staff/hrim>

### Program Overview

The Department of Hotel, Restaurant and Institutional Management offers a program leading to a Master of Science in Hospitality Information Management. The goal of the program is first to develop students for successful careers as corporate hospitality information managers, consultants, and hospitality systems implementation professionals, and second to offer high-quality,

professional-level instruction for current hospitality managers seeking to further their education by applying technology solutions in operational settings. It is also designed to provide students interested in future doctoral work in hospitality and tourism management a sound foundation toward that goal.

#### Requirements For Admission

Admission to the program is selective and competitive based on the number of applicants and limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. Prospective full-time candidates are admitted for the fall semester only. Part-time candidates may begin in the fall or spring semester.

Candidates for admission need not have majored in HRIM previously, but they will be expected to possess:

- Strong written and oral communication skills
- Mathematical ability (a minimum level of math equivalent to MATH 114)
- An understanding of computer systems and basic applications, such as word processing and spreadsheets (equivalent to CISC 101, CISC 105 or ACCT 160)
- Knowledge of network terminology and typology (equivalent to HRIM 144)

Appropriate credit and non-credit courses are available at UD to students with deficiency in any of these areas.

Specific admission requirements are:

- A minimum combined verbal and quantitative score of 1050 on the GRE (GMAT scores are also acceptable)
- A minimum overall undergraduate GPA of 3.0 (out of 4.0)
- A Bachelor's degree from an accredited college or university
- Acceptable evaluation of three (3) letters or recommendation
- Students whose first language is not English must achieve a minimum score of 550 on the paper-based Test of English as a Foreign Language (TOEFL).

In special cases, provisional admission to the program may be offered with specific requirements necessary to receive regular

standing articulated in advance of the student's provisional admission. See Graduate Admissions for additional information, particularly for application procedures and dates.

#### Requirements For The Degree

The program, which offers both a non-thesis option and a thesis option, requires 36 credit hours. All MS students complete the following list of courses required for the degree:

Course	Credits
HRIM 601	Advanced Hospitality and Tourism Product Management 3
HRIM 602	International Hospitality and Service Management 3
HRIM 603	Strategic Hospitality Management 3
HRIM 604	Hospitality Financial Management Issues 3
HRIM 605	Issues in Hospitality Information Technology 3
HRIM 642	Hospitality Computer-Based Training 3
HRIM 648	Data-Mining Analysis in the Hospitality Industry 3
HRIM 687	Management Systems in the Hospitality Industry 3
EDUC 685	Multimedia Literacy or equivalent 3
UAPP 800	Research Design and Methodologies or equivalent 3
TOTAL	30

#### Non-Thesis Option

In addition to the above list of courses, those who select the non-thesis option are required to complete the following two courses.

HRIM 664	Hospitality Technology Internship	3
HRIM 668	Hospitality Industry Project	3

As part of the Hospitality Industry Project course, non-thesis candidates are expected to compile a portfolio of their completed projects and make an oral presentation before a panel of two faculty and three - four members of the HRIM Information Technology Advisory Board or other hospitality technology professionals.

#### Thesis Option

Those students who select the thesis option enroll for six thesis credits (HRIM 869). Degree completion also requires: 1) presentation of thesis research results in seminar format to department faculty, 2) submission of manuscript draft for publication, and 3) satisfactory

## College of Earth, Ocean, and Environment

performance on the final oral defense of their Masters' thesis.

### College of Earth, Ocean, and Environment

Telephone: Newark (302) 831-2841, Lewes (302) 645-4226

College website: [www.ceoe.udel.edu](http://www.ceoe.udel.edu)

Faculty Listing: [www.ceoe.udel.edu/people/faculty.aspx](http://www.ceoe.udel.edu/people/faculty.aspx)

Department of Geography: [www.udel.edu/Geography](http://www.udel.edu/Geography)

Department of Geological Sciences: [www.geosci.udel.edu](http://www.geosci.udel.edu)

School of Marine Science & Policy: [www.ceoe.udel.edu/academics/smsp/index.shtml](http://www.ceoe.udel.edu/academics/smsp/index.shtml)

#### Program Overview

The College of Earth, Ocean, and Environment (CEOE) is dedicated to advancing the understanding of Earth's natural systems and the interactions of humans with the environment through engaged interdisciplinary research, teaching, and outreach.

The study of earth, ocean, and environmental systems is a vital part of ensuring a healthy future for our planet and all its inhabitants.

The College of Earth, Ocean, and Environment (CEOE) provides exemplary instruction with the goal of preparing students for a meaningful career in education, research, business, or government service.

Our multidisciplinary approach enables students to handle complex issues and give them a competitive advantage in their careers. The college's goal is to produce well-rounded scientists, researchers and policy specialists who have the broad vision and interdisciplinary background necessary to address the sweeping, interrelated issues that are part of the study of ocean, earth and environmental systems.

CEOE offers the following graduate degree programs: Master's degrees in Geography, Geology, Marine Policy, Marine Studies, Ocean Engineering, and Oceanography; a non-thesis Master of Marine Management (M.M.M.) degree; and PhD degrees in Geography Geology, Marine Studies, Oceanography, and Ocean Engineering.

The goal of the college is to educate scholars who will provide intellectual leadership in the areas of the physical and human geography, geological sciences, marine biosciences, marine policy, oceanography, and physical ocean science and engineering. Graduates of

the college are expected to understand the complex interactions of these areas in real-world situations, in addition to mastering advanced work in the area of their specialty.

The college has facilities in two locations: on the main campus of the University in Newark and on the Hugh R. Sharp Campus in the coastal city of Lewes at the mouth of the Delaware Bay. During the academic year, courses are taught at both sites. Interactive television linking the two sites minimizes the need for commuting between campuses. Students may live at either location depending on the nature of their research and the location of their advisor.

The college offers both field-oriented and laboratory-oriented research programs that take advantage of easy access to the Atlantic coast and Coastal Plain, the Delaware and Chesapeake Bays, and upland areas of the Piedmont and Appalachian Mountains. Additionally, there are many ongoing opportunities for research at a variety of locations around the world.

#### Admission

Graduate student selection and advisement receive special attention at CEOE. Following a careful evaluation of Graduate Record Examination (GRE) scores, undergraduate record, and three letters of recommendation, faculty and potential research advisors invite the most promising applicants to campus for interviews. A faculty member must agree to serve as the student's advisor before admission may be offered.

All graduate degree applicants should submit the following:

- A completed graduate school application form plus application fee
- GRE general aptitude test scores
- GRE Biology Advanced Test for marine biosciences applicants
- Official transcripts of all college work
- Three letters from persons qualified to judge the student's potential for graduate work
- A supplemental page indicating the student's specific interests (necessary to help the college identify an appropriate advisor)

The University of Delaware states that applicants should have a combined verbal and quantitative GRE score of at least 1050. The college generally has admitted applicants with combined verbal and quantitative GRE scores exceeding 1200 (with good advanced test scores) and an overall grade point average exceeding 3.0 (4.0=A).

## Student Expectations

Doctoral students should have the analytical skills needed to perform original, independent research of sufficient scope and depth for publication in internationally recognized professional journals. Proficiency in field and laboratory techniques and in computerized data processing must also be demonstrated through written and oral qualifying examinations and the doctoral dissertation.

Master's degree students have similar, but less exhaustive requirements. Master's candidates are required to complete 30–39 graduate credits and complete a thesis. The exception is the MMM, a degree program designed for mid-career professionals. The MMM degree requires 31 credits and does not require a thesis.

## Research Opportunities

In addition to advanced work in the area of their specialty, graduate students in the college have the opportunity to conduct research on critical marine and earth issues under the guidance of distinguished faculty. Students are expected to think broadly about their work and its implications for society. Courses outside the student's specialty ensure a well-rounded background.

## Research Centers and Affiliated Resources

### RESEARCH CENTERS AND AFFILIATED RESOURCES

In addition to the several research centers housed within CEOE, there are also several programs that are affiliated with the college. These include The Delaware Geological Survey (DGS) and the Scientific Committee on Oceanic Research (SCOR).

DGS was established by an Act of the General Assembly in 1951 and is organized as an affiliated agency of the College Earth, Ocean, & Environment. This arrangement reflects both the research orientation of the Survey and the need for practical applications of geology throughout the state. The Delaware Geological Survey's mission is, by statute, geologic and hydrologic research and exploration, and dissemination of information through publication and public service. The goal of DGS is to provide objective scientific geologic and hydrologic information, advice, and service to our stakeholders. This goal is accomplished by conducting geologic, hydrologic, and geologic hazard investigations and services and by

continuing development of our infrastructure through basic data collection and computer-based data management and dissemination programs. The scientific information is used to advise, inform, and educate stakeholders about the important roles that the earth sciences play in such topics as water resources, public health, agriculture, economic development, land-use planning, environmental protection, geologic hazards, energy and mineral resources, emergency planning, response, and recovery, and recreation.

Survey programs are coordinated with a number of state agencies, and the Survey serves, by statute, as the state's cooperator with such federal units as the U.S. Geological Survey, Minerals Management Service, and the Delaware River Master. Liaison and counsel are provided to other appropriate governmental and technical units through various appointments held by the State Geologist and other members of the scientific staff. The Delaware Geological Survey Building was completed in 1989. Because of the physical proximity of and collaboration between DGS and the Department of Geological Sciences in Penny Hall, students benefit from association with Survey geologists and their research projects. The Survey has formal internship programs in geology and hydrology with Geological Sciences and the Water Resources Center that provide opportunities for students to conduct research and obtain practical experience while working with Survey Scientists. Several survey scientists also hold secondary appointments in Geological Sciences, participate in teaching programs, and serve on graduate student committees.

Originally formed by the International Council for Science (ICSU) in 1957, the Scientific Committee on Oceanic Research (SCOR) explores scientific questions about the ocean that often require an interdisciplinary approach. SCOR was the first interdisciplinary body formed by ICSU.

SCOR activities focus on promoting international cooperation in planning and conducting oceanographic research, and solving methodological and conceptual problems that hinder research. Scientists from 35 nations participate in SCOR working groups and steering committees. Approximately 250 scientists participate in SCOR activities on a voluntary basis at any given time.

SCOR has been instrumental in the planning and coordination of large-scale ocean research projects for long-term, complex natural

phenomena SCOR provides a mechanism to bring together international scientists for this purpose.

## Research Facilities

Robinson Hall, on the UD main campus in Newark, is CEOE's administrative base, housing two programs, Marine Policy and Physical Ocean Science and Engineering. It is also home to two of the college's five research centers. The Center for Remote Sensing gathers and analyzes satellite data to yield valuable information about oceanic properties and coastal resources, ranging from the dispersion of oil slicks to global change in plant production. The Gerard J. Mangone Center for Marine Policy, the first of its kind to be established at an American university, conducts interdisciplinary ocean and coastal policy research and education programs with a variety of local, national, and international partners.

Penny Hall is also located on the main campus in Newark. It houses undergraduate and graduate students in the geological sciences. The department has ready access to an x-ray diffractometer, paleomagnetic equipment, gas and liquid chromatographs, ground penetrating radar, multichannel seismic equipment, a variety of coring and drilling equipment, tripod mounted lidar, an electronic total station, an Autonomous Underwater Vehicle equipped with sidescan sonar and other sensors, and a variety of boats, including a 25-ft. vessel outfitted for geological research in the Delaware Bay. Through its cooperative programs with several nearby institutions, including the Delaware Geological Survey, the department has ready access to nearly all other commonly used tools of geological and geophysical research. The University of Delaware GIS laboratory is also located in Penny Hall.

Based in Pearson Hall, the Geography department houses the University's Center for Climatic Research and the Office of the State Climatologist for Delaware. Research facilities include laboratories for cartography, microclimatology, biogeography, Geographic Information Science and computer analysis. The department is well-equipped with microclimatic and other fieldwork instrumentation and workstations and related peripherals for GIS work. The department also maintains high-end UNIX servers for modeling and data analysis, good connections to university-wide computing resources, and connections to SURA-Grid for supercomputing needs.

Our newest addition is a non-rigid airship, better known as a blimp, that is used as an environmental research and monitoring platform for many research and education applications. The airship, known as the Low-Altitude Environmental Analysis Dirigible (LEAD) is believed to be the first of its kind in a university setting. The brainchild of Michael A. O'Neal, assistant professor of geography and made possible by a generous gift from Alumna Rachel Jewett Ledbetter ('44), the UD blimp project includes faculty from three colleges--the College of Earth, Ocean, and Environment; the College of Engineering; and the College of Arts & Sciences. The 60-foot long blimp operates via remote control at altitudes of up to 500 meters with instrument payloads of up to 100 pounds. It has an interchangeable payload design, enabling it to be equipped with a variety of imaging instrumentation, including a laser scanner and visible, ultraviolet, and infrared cameras.

Also based in Newark, the Lamot du Pont Chemistry, Biochemistry, and Marine Studies Laboratory provides state-of-the-art, contamination-free, "clean-lab" facilities for the study of trace metals in marine waters and sediments. The nearby Delaware Biotechnology Institute, a partnership among government, academia, and industry to help establish Delaware as a center of excellence in biotechnology and the life sciences, supports leading-edge interdisciplinary research in genomics and proteomics, including marine science initiatives.

Another major coastal research facility available at UD is the College of Engineering's Ocean Engineering Lab in the Center for Applied Coastal Research. CEOE students may use the lab's flumes and wave basins through a joint degree program offered by the College of Earth, Ocean & Environment and the College of Engineering. The lab contains such novel equipment as the directional wave basin -- a 66-foot-long, 66-foot-wide, 3.3-foot-deep apparatus equipped with 34 wave-generating paddles for simulating a realistic sea. Faculty and students use the device to study the physics of waves and the effectiveness of various coastal protection measures.

At the Hugh R. Sharp Campus in Lewes, on the shores of Delaware Bay, CEOE provides all the amenities for a thriving marine research and teaching program, including offices, research and teaching laboratories, classrooms, computer facilities, and a library. Cannon and Smith laboratories are equipped with recirculating

seawater systems and controlled-environment rooms for maintaining saltwater fish and plants. Cannon Lab also is home to two research centers: the Center for Marine Environmental Genomics focuses on deciphering the genetic code of marine organisms and determining the role that specific genes play, while the Ocean Information Center electronically archives a wide variety of marine data for use by scientists around the world.

Smith Lab includes a shellfish hatchery, algal culture facilities, fish aquaria, microbiology labs, and greenhouse space for halophyte (salt-tolerant plant) research. It also houses the Center for Halophyte Biotechnology, which is developing salt-tolerant plants for agricultural use and wetlands restoration in collaboration with local and international partners.

Two smaller laboratories in Lewes contain specialized research facilities. Henlopen Lab, adjacent to Cape Henlopen State Park, is home to one of the world's only tilting wind-wave tanks for studying physical phenomena at the air-sea interface. The Pollution Ecology Laboratory serves as supplemental space for marine geological research.

The Adrian S. Hooper Marine Operations Building and harbor support the seagoing research activities of the college. The harbor is home port of the 146-foot Hugh R. Sharp research vessel. Several smaller vessels are available for scientific exploration and sampling in nearby Delaware Bay and coastal Atlantic waters.

## **Geography**

Telephone: (302) 831-2294

<http://www.udel.edu/Geography>

Faculty Listing: <http://www.udel.edu/Geography/faculty.html>

### **Program Overview**

The department offers programs leading to the Master of Arts, Master of Science and Doctor of Philosophy degrees in Geography. The graduate program provides the opportunity for students to interact frequently with a staff whose interests touch upon one of three themes: climatology, land-surface processes, and human geography.

The climatology program emphasizes physical, synoptic, dynamic, and water budget climatology. The land-surface processes emphasis includes work on geomorphology, periglacial landforms, permafrost, and flows of

water and trace chemicals through the biota and the soil.

The human geography program covers a broad range of themes approached from cultural-historical, socio-economic and humanistic perspectives. All three subareas intersect for work in such areas as sea-ice dynamics and monitoring, glaciology, landscape evidence of climatic change, human influences on climate, climate and human health, and human interactions with the physical landscape. Interdisciplinary work with other departments and colleges is encouraged.

### **Research Centers**

The department houses the University's Center for Climatic Research and the Office of the State Climatologist for Delaware. Facilities include laboratories for cartography, microclimatology, biogeography, geographic information science and computer analysis. The department is well-equipped with microclimatic and other fieldwork instrumentation and workstations and related peripherals for GIS and remote sensing work. The department also maintains high-end UNIX servers for modeling and data analysis, good connections to university-wide computing resources, and connections to SURA-Grid for supercomputing needs.

### **Requirements For Admission**

General admissions requirements are an undergraduate index of 2.75 or more and combined GRE scores of at least 1050. Admission is selective and competitive based on the number of well qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. The department will consider qualified applicants without previous background in geography, although additional preliminary work may be required.

### **Financial Aid**

Teaching assistantships, research assistantships and University fellowships are available to graduate students at the MA, MS, and PhD levels. In addition, this department regularly assists students in finding fellowships via outside programs, such as NASA or American Meteorological Society fellowships. Please refer

to Graduate Fellowships and Assistantships for additional information.

### Requirements For The Master's Degrees

Students in either master's program complete (with a B average or better) a total of 24 course credits as well as a thesis (6 credits). In general, students in the human geography area will work toward the Master of Arts degree, while climatology and land-surface processes students will pursue the Master of Science. Course work programs are tailored to the student's research interest, and each student's work is periodically reviewed. There is no special examination or language requirement.

It is the responsibility of the student in consultation with the thesis adviser to complete the thesis and to obtain acceptance by the thesis committee. A public presentation of the thesis to the department also is required.

### Requirements For The PhD Degree

Applicants to the PhD program concentrations in Climatology or Land-Surface Processes are expected to have completed a master's degree in geography, geology, climatology, meteorology, or another related discipline. Students in these concentrations must also have completed mathematics through ordinary differential equations and must demonstrate a knowledge of at least one higher level computer programming language. PhD students are expected to obtain an in-depth knowledge of two areas. One of these must be topical, such as bioclimatology, physical climatology and land-surface processes urban climatology, or climate dynamics for the Climatology concentration, or land-surface measurement, surface process analysis, biogeochemistry, or geomorphology for the Land-Surface Processes concentration. The other area must be methodological such as statistical methods, mathematical modeling, or geographic information science..

Students are also expected to demonstrate a high level of professional competence by passing a written qualifying examination, an oral examination and an oral dissertation defense. More description of the PhD program can be obtained by contacting the Geography Department.

### **Geological Sciences (MS, PhD)**

Telephone: (302) 831-2569 or 831-8750

<http://www.geosci.udel.edu/>

Faculty Listing: <http://www.geosci.udel.edu/>

[faculty.html](#)

### Program Overview

The University of Delaware offers academic and research programs leading to Master of Science and Doctor of Philosophy degrees in geology to qualified students who hold bachelor's degrees in the field of geology or related science and engineering disciplines. Major research emphases are coastal and marine geology, geomorphology, hydrogeology, stratigraphy, Quaternary geology, and near-surface geophysics.

### Requirements For Admission

Admission to the graduate program in the Department of Geological Sciences is evaluated on the basis of the applicant's GRE scores, undergraduate record, three letters of recommendation and research interests language. Applicants should have a combined verbal and quantitative GRE scores of at least 1050. A minimum TOEFL score of 600 is required for foreign applicants for whom English is not the first language. Admission to the graduate program in the Department of Geological Sciences is selective and competitive based on the number of qualified applicants and the availability of faculty and facilities. Students who meet the minimum academic requirements are not guaranteed admission.

### Financial Aid

Please refer to Graduate Fellowships and Assistantships for more information.

### Requirements For The Degrees

Requirements for the Master of Science degree include 30 credits of graduate study (6 of which are thesis credits) and the research, preparation, and defense of a thesis. Requirements for the Doctor of Philosophy degree include a Master of Science degree, an oral and written comprehensive exam, a course program developed with the student's dissertation committee (including 9 credits of dissertation research), and the research, preparation, and defense of the dissertation. All graduate students are required to register for GEOL 601 (Geological Sciences at Delaware) during their first fall term at the University. GEOL 605 (Stratigraphy) is also required of all graduate students. For both the MS and PhD degrees, course programs are otherwise developed on an individual basis to meet the specific needs of the student. The

program of study and research is formed by student consultation with the advisor and thesis or dissertation research committee. Because of the value of the teaching experience, PhD candidates are expected to teach a course or laboratory section for at least one semester.

## **Marine BioSciences (MS, PhD)**

Telephone: (302) 831-2841

<http://www.ceoe.udel.edu/academics/smsp/mbsci/index.shtml>

Faculty Listing: <http://www.ocean.udel.edu/academics/departments/biology/faculty.aspx>

### Program Overview

Students in the Marine Biosciences Program are exposed to a broad spectrum of modern approaches to understand the organization and function of biological systems in marine environments. The M.Bsci. Program is highly integrative and students are exposed to a wide range of subjects in their course work and research projects, from molecular biology and biochemistry to ecology and ecosystem studies. Areas of faculty interest within the program span the ecology, physiology, genetics, and molecular biology of plants, animals and microbes. Faculty research specializations are particularly concentrated in: microbial physiology and molecular ecology; larval ecology and molecular biology; chemical ecology; fisheries ecology; aquacultural genetics and genomics; wetland restoration. In addition to the sophisticated classroom and laboratory facilities available, students enjoy ready access to a variety of marine ecosystems near the Hugh R. Sharp Campus in Lewes: dunes, salt marshes, mudflats, estuaries, and the Atlantic Ocean. Field research takes place from the Arctic to the Antarctic, in environments ranging from coral reefs to deep-sea hydrothermal vents, to local salt marshes and coastal waters.

### Requirements For Admission

Prospective students must submit Graduate Record Examination (GRE) scores. Applicants are encouraged to take the Biology Advanced test as well. Successful applicants typically have combined verbal and quantitative GRE scores above 1200 and grade-point averages above 3.0 (4.0 = A).

Applicants should also submit a letter of intent, stating specific interests and objectives for seeking graduate study. Early application for admission is advised. Please review the other

requirements listed in the Graduate Admissions section.

### Financial Aid

Please refer to the Graduate Fellowships and Assistantships section for more information.

### Requirements For The Degrees

All students in the master's program are required to complete 30 graduate credits. A course outside of the Marine Biosciences Program and the student's area of concentration is also required. All students must write a thesis. Students may bypass the master's degree and work directly toward the PhD upon petition. Written and oral qualifying examinations are required before students are admitted to candidacy for the PhD degree.

#### M.S. in Marine Studies with a concentration in Marine Biosciences

Required courses:

MAST 627 Marine Biology  
MAST 634 Marine Molecular Sciences  
MAST 821 Marine BioSciences Seminar or equivalent must be taken at least one semester during each year of residence.

One course (minimum 3 credits) outside of the program. This may be one of the specially designed introductory courses or a more advanced course. Introductory courses include MAST 602 (Physical Oceanography), MAST 637 (Geological Oceanography), MAST 646 (Chemical Oceanography) and MAST 670 (U.S. Ocean and Coastal Policy).

Thesis: 6 credits

Additional graduate-level coursework (as determined by student's advisory committee).

#### Ph.D. in Marine Studies with a concentration in Marine Biosciences

MAST 621 Coastal Field Biology  
MAST 627 Marine Biology  
MAST 634 Marine Molecular Sciences  
MAST 821 Marine BioSciences Seminar or equivalent must be taken at least one semester during each year of residence.

Dissertation: 9 credits

Additional graduate-level coursework (as determined by student's advisory committee).

## Marine Policy (MMP, PhD)

Telephone: (302) 831-2841

[www.ceoe.udel.edu/academics/smsp/marinepolicy/index.shtml](http://www.ceoe.udel.edu/academics/smsp/marinepolicy/index.shtml)

Faculty Listing: [www.ceoe.udel.edu/academics/smsp/marinepolicy/faculty.aspx](http://www.ceoe.udel.edu/academics/smsp/marinepolicy/faculty.aspx)

### Program Overview

The Marine Policy Program examines the economic, legal, political, and social aspects of the world ocean, the seabed, and the coastal zone. Students and faculty in the program analyze public issues regarding the law of the sea, ports and shipping, marine minerals, ocean and coastal zone management, fisheries, naval affairs, marine biotechnology, and the global environment, frequently making recommendations for policy at the regional, national, and international level.

The Master of Marine Policy prepares students for careers in research, management, and administration in marine-oriented government agencies, private associations, and business firms. For a few highly qualified students who already hold an advanced degree in marine policy or a related subject and who generally have some experience in policy research or management, the PhD in Marine (Policy) Studies is available.

### Requirements For Admission

#### Master of Marine Policy

Prospective students must submit Graduate Record Examination (GRE) scores. Successful applicants typically have combined verbal and quantitative GRE scores above 1100 and grade-point averages above 3.0 (4.0 = A).

Applicants should also submit a letter of intent, stating specific interests and objectives for seeking graduate study. Early application for admission is advised. Please review the other requirements listed in the Graduate Admissions section.

Regarding Financial Aid, please refer to the Graduate Fellowships and Assistantships section.

#### Requirements For The Degrees

All students in the master of marine policy program are required to complete 39 graduate credits. A course outside of the Marine Policy Program and the student's area of concentration is also required. Students pursuing this degree

must write a thesis. Students may bypass the master's degree and work directly toward the PhD upon petition. Requirements for the PhD degree are similar to those for the master's degree, but are more intensive. Written and oral qualifying examinations are required before students are admitted to candidacy for the PhD degree.

#### Master of Marine Policy (M.M.P.)

Required courses:

MAST 670 U.S. Ocean and Coastal Policy  
MAST 873 Seminar: Marine Policy (must be taken 3 semesters)

MAST 675 Economics of Natural Resources

MAST 676 Environmental Economics

MAST 677 International Ocean and Environmental Policy

MAST 817 Research Design and Methods or

MAST 672 Applied Policy Analysis

MAST 873 Marine Policy Seminar or equivalent must be taken at least one semester during each year of residence.

CEOE course outside the marine policy program.

Thesis: 6 credits

Elective courses in policy and policy analysis approved by advisor (12 credits)

PhD in Marine Studies with a concentration in Marine Policy

Required courses:

Completion of M.M.P. or equivalent work at another university or M.M.P. bypass.

MAST 873 Marine Policy Seminar or equivalent must be taken at least one semester during each year of residence.

CEOE course outside the Marine Policy Program\*

Disciplinary concentration approved by advisor (e.g., economics, political science)

Additional Research and Methodology course approved by advisor.

Dissertation: 9 credits

Additional graduate-level course work as determined by advisory committee.

\*Does not apply to students who satisfied the requirement during M.M.P. at UD

## **Oceanography (PhD)**

Telephone: (302) 831-2841

[www.ceoe.udel.edu/academics/smsp/oceanography/index.shtml](http://www.ceoe.udel.edu/academics/smsp/oceanography/index.shtml)

Faculty Listing: [www.ceoe.udel.edu/academics/smsp/oceanography/faculty.aspx](http://www.ceoe.udel.edu/academics/smsp/oceanography/faculty.aspx)

### **Program Overview**

Oceanography Program faculty and students conduct research on physical, geological, biological, and chemical problems in estuarine, coastal, and marine environments. Historically, the program's focus has been estuarine, coastal, and continental shelf studies in the Mid-Atlantic region. Our research studies have made the nearby Delaware, Chesapeake, and Delmarva Coastal Bays some of the most extensively studied estuaries in the world. In addition, faculty and students have had increasing interests in issues related to global environmental change in a number of other regions of the world.

Estuarine waters, salt marshes, and sediments provide ideal sites for work on the cycling of particulate material, trace metals, nutrients, and organic matter. An integrated picture of contrasting estuarine behavior is emerging from studies of circulation, chemistry, sedimentary geology, and planktonic biology in these contrasting environments. Faculty and students investigate topics at scales as large as paleohistorical circulation patterns, and as small as chemical cycles in algal mats. Multidisciplinary studies of the hydrology and ecology of intertidal groundwater seepage and the controls of harmful and noxious algal blooms are also explored. Together with the Center for Remote Sensing, faculty and students study the impact of land-use changes on wetlands and estuarine waters and the effects of oceanic circulation on climate. The Oceanography Program fosters an environment where a diverse faculty and student body work together to understand marine and environmental processes in the interest of solving environmental and societal problems.

### **Requirements For Admission**

Prospective students must submit Graduate Record Examination (GRE) scores. Successful applicants typically have combined verbal and quantitative GRE scores above 1200 and grade-point averages above 3.0 (4.0 = A).

Applicants should also submit a letter of intent, stating specific interests and objectives for seeking graduate study. Early application for admission is advised. Please review the other requirements listed in the Graduate Admissions section.

### **Financial Aid**

Please refer to the Graduate Fellowships and Assistantships section for more information.

### **Requirements For The Degrees**

All students in the master's program are required to complete 30 graduate credits. A course outside of the Oceanography program and the student's area of concentration is also required. All students must write a thesis. Students may bypass the master's degree and work directly toward the PhD upon petition. Requirements for the PhD degree are similar to those for the master's degree, but are more intensive. Written and oral qualifying examinations are required before students are admitted to candidacy for the PhD degree.

### **MS in Marine Studies with a concentration in Oceanography**

Required courses:

Any two of the following core courses:

MAST 602 Physical Oceanography or equivalent

MAST 646 Chemical Oceanography or equivalent

MAST 637 Geological Oceanography or equivalent

MAST 627 Marine Biology or equivalent

MAST 853 Oceanography Seminar or equivalent must be taken at least one semester during each year of residence.

At least three (3) credits of 800-level courses other than courses used to meet seminar and core required courses must be completed.

One three (3) credit course in Marine Policy or one three (3) credit course outside of the student's declared sub-discipline of interest (not including courses taken to meet the program core course requirement) as approved by the advisor and the program director must be completed.

Thesis or Research: 6 credits

Additional courses may be required by the student's advisory committee.

## PhD in Oceanography

### Required courses:

- MAST 602 Physical Oceanography or equivalent  
MAST 646 Chemical Oceanography or equivalent  
MAST 637 Geological Oceanography or equivalent  
MAST 627 Marine Biology or equivalent

MAST 853 Oceanography Seminar or equivalent must be taken at least one semester during each year of residence.

At least six (6) credits of 800-level courses other than courses used to meet seminar and core required courses must be taken.

One three (3) credit course in Marine Policy or one three (3) credit course outside of the student's declared sub-discipline of interest (not including courses taken to meet the program core course requirement) as approved by the advisor and the program director must be completed.

Dissertation or Research: 9 credits

Additional courses may be required by the student's advisory committee.

## Physical Ocean Science And Engineering (MS, PhD)

Telephone: (302) 831-2841

[www.ceoe.udel.edu/academics/smsp/pose/index.shtml](http://www.ceoe.udel.edu/academics/smsp/pose/index.shtml)

Faculty Listing: [www.ceoe.udel.edu/academics/smsp/pose/faculty.aspx](http://www.ceoe.udel.edu/academics/smsp/pose/faculty.aspx)

### Program Overview

Students in the Physical Ocean Science and Engineering Program apply basic physical principals in their research in coastal physical oceanography, ocean acoustics, nearshore processes, environmental fluid dynamics, estuarine dynamics, and ocean engineering. Two degree plans are offered. The Master of Science and Doctor of Philosophy in Marine Studies are offered through the College Earth, Ocean, & Environment. The Master of Science and Doctor of Philosophy in Ocean Engineering are offered through a cross-disciplinary program operated jointly by the CEOE and the College of Engineering. (See the Ocean Engineering section in the College of Engineering for specific degree).

This multidisciplinary academic program provides students with broad knowledge in physical oceanography as well as opportunities to focus on desired areas of expertise. The program is particularly appropriate for students with physics, mathematics, or engineering backgrounds.

### Requirements For Admission

Prospective students must submit Graduate Record Examination (GRE) scores. Successful applicants typically have combined verbal and quantitative GRE scores above 1200 and grade-point averages above 3.0 (4.0 = A).

Applicants should also submit a letter of intent, stating specific interests and objectives for seeking graduate study. Early application for admission is advised. Please review the other requirements listed in the Graduate Admissions section.

### Financial Aid

Please refer to the Graduate Fellowships and Assistantships section for more information.

### Requirements For The Degrees

All students in the master's program are required to complete a minimum of 30 graduate credits. A course outside of the POSE program and the student's area of concentration is required. All students must write a thesis. Students may bypass the master's degree and work directly toward the PhD upon petition. Requirements for the PhD degree are similar to those for the master's degree, but are more intensive. Written and oral qualifying examinations are required before students are admitted to candidacy for the PhD degree.

### MS in Marine Studies with a concentration in Physical Ocean Science and Engineering

#### Required courses:

Minimum of 24 graduate course credits (including those listed below):

MEEG 690 Intermediate Engineering

Mathematics

MAST 693

Waves in the Marine Environment

OR

MAST 800 Dynamical Physical Oceanography

MAST 691

## College of Education and Human Development

Ocean Fluid Dynamics  
MAST 882 Physical Ocean Science and  
Engineering Seminar

One of the following courses:

MEEG 891 Advanced Engineering  
Mathematics  
MAST 811 Oceanographic Time Series Analysis

One course outside of the student's home program (minimum of 3 credits). This may include one of the specially designed introductory courses or a more advanced course. Students may not test out of these classes. Introductory courses outside of this program include MAST 627 Marine Biology or MAST 670 U.S. Ocean and Coastal Policy. NOTE: MAST 601 Introduction to Oceanography will not meet this requirement. Physical oceanography courses will not meet this requirement.

MAST 882 Physical Ocean Science and Engineering Seminar or equivalent must be taken each spring semester during every year of residence

Thesis or Research: 6 credits

Additional graduate-level course work as determined by advisory committee.

PhD in Marine Studies with a concentration in Physical Ocean Science and Engineering

Required courses:

MEEG 690 Intermediate Engineering  
Mathematics  
MAST 693 Waves in the Marine Environment  
MAST 691 Ocean Fluid Dynamics  
MAST 882 Physical Ocean Science and  
Engineering Seminar  
MEEG 891 Advanced Engineering Mathematics  
MAST 800 Dynamical Physical Oceanography  
MAST 811 Oceanographic Time Analysis

One course outside of the student's home program (minimum of 3 credits). This may include one of the specially designed introductory courses or a more advanced course. Students may not test out of these classes.

One 3 credit appropriate modeling course to be determined by the student in consultation with his/her advisor or advisory committee.

MAST 882 Physical Ocean Science and Engineering Seminar or equivalent must be taken each spring semester during every year of residence

Dissertation: 9 credits.

Additional graduate-level course work as determined by dissertation advisory committee.

## College of Education and Human Development

With an interdisciplinary approach that integrates instruction with research and service, graduate programs of the College of Education and Human Development prepares students to enhance human systems and development, strengthen educational practices and policies, and encourage effective policies and management in public, private and nonprofit organizations.

The College of Education and Human Development offers graduate degree programs through the School of Education and the Department of Human Development and Family Studies.

The College of Education and Human Development graduate students have unequalled opportunities to participate in research and public service as well as internships in a variety of organizational settings and practicum experiences in schools. Many graduate students affiliate with one of the College's nationally renowned research and public service centers. For more information, please see <http://www.udel.edu/cehd>.

### Research and Public Service Centers

In addition to the extensive scholarly research and public service conducted by individual faculty and staff, the college's research and public service centers provide research expertise and educational services to thousands of clients annually, including national and international groups and agencies as well as regional, state and local organizations. Students work with faculty and staff on virtually all these efforts, designing research projects, developing training programs, gathering and analyzing data, organizing conferences, and writing and presenting research reports, scholarly papers and journal articles.

The research and service centers listed below are profiled in detail in the Research Centers, Institutes, and Special Facilities section of this catalog.

- Center for Disabilities Studies
- Delaware Center for Teacher Education
- Delaware Education Research and Development Center

- Office of Educational Technology
- Mathematics & Science Education Resource Center

Other College of Education and Human Development Facilities

As a professional service-oriented college, The College of Education and Human Development has a unique combination of other facilities that provide a wide range of clinical experience and research settings for graduate students and faculty:

The College School located at 459 Wyoming Road, provides a school-year program for children, grades 1-8, with learning differences. The school provides individualized and innovative instruction for children who have had unsuccessful school experiences, with the goal of returning these students to more traditional educational environments within an average of 2-3 years. The school also serves as an observation, research, and clinical site for students and faculty in Education, Scholl Psychology, Clinical Psychology, Nursing, Physical Education, Nutrition and many other disciplines. For further information: [www.udel.edu/collegeschool](http://www.udel.edu/collegeschool), or call (302) 831-0222.

The Early Learning Center is a joint project of the Colleges of Education and Human Development, Arts and Sciences and Health Sciences. The Center opened in June 2004 and is a state-of-the-art comprehensive early care and education facility. It offers quality child care and other services for families, including intervention services; technical assistance and training for community family-service providers; a laboratory for faculty and student researchers from several UD colleges; and a hands-on learning site for graduate and undergraduate students from across the campus. For more information, please see <http://www.udel.edu/elc> or contact Peg Bradley, Director, at [pbradley@udel.edu](mailto:pbradley@udel.edu).

The University of Delaware Laboratory Preschool, located at 459 Wyoming Road, is a NAEYC accredited model preschool program, provides appropriate developmental programs for children with and without disabilities; teaches University students to work with young children through classroom practicum experiences; provides opportunities for students, faculty and professionals to observe exemplary preschool programs and teacher role models; enables students to observe children ages two through six so the students can better understand developmental progression; and provides a

research site for students and faculty. For further information, visit [www.labpreschool.udel.edu](http://www.labpreschool.udel.edu), or contact Sarah Bergan, Administrative Coordinator at (302)831-2304 or e-mail: [bergan@udel.edu](mailto:bergan@udel.edu).

## School of Education

Telephone: (302) 831-1165

<http://www.udel.edu/education>

Faculty Listing: <http://www.udel.edu/education/people/index.html>

### Program Overview

The School of Education offers graduate programs at the doctoral, specialist, and master's levels. Our graduate programs prepare students for careers devoted to the solution of important educational problems – either through basic or applied research. Students in the Ph.D. in Education and the Ph.D. in Economic Education programs work closely with leading scholars in education and develop their own lines of investigation. Students in the Ed.D. program develop knowledge and skills related to the exercise of effective leadership in areas of policy, administration, technology, and instruction. Students in the master's and specialist programs develop knowledge and skills in academic content areas, teaching, educational technology, school psychology, higher education and school leadership. The professional education programs have received the State of Delaware approved program status. In addition, they have been recognized for meeting the standards of the national educational specialty organization in their field. The University of Delaware is an NCATE accredited institution. Doctor of Philosophy in Economic Education Degree

Telephone: (302) 831-1165

The PhD program in Economic Education is a joint doctoral program between the School of Education and the Department of Economics. Economic Education includes two distinct competencies, one in Education that involves primarily the teaching of economics in K-12 settings and one in Economics that involves education public policy issues (i.e., school financing, vouchers, testing, human capital development) and also the education production process at both the K-12 and post-secondary levels. Traditionally, professionals and researchers in the field of Economic Education have been trained in either economics or in education, with little or no meaningful cross-

training in the other area. The next generation of leaders in this field will need to know far more about economics than is learned in a typical graduate program in Education and far more about educational issues than is learned in a typical graduate program in Economics. This new joint program will bridge the gap between these related disciplines and provide a specialization in Economic Education.

Skills like these will be valuable in a wide range of employment sites: Centers for Economic; education units within regional Federal Reserve Banks and other private sector businesses and foundations with an interest in economic and financial literacy; school districts and state departments of instruction; education consulting and evaluation firms; and universities.

Students may earn an MA in Economic Education degree by successfully completing the following courses: EDUC 805, EDUC 806, EDUC 850, EDUC 852, ECON 801 or ECON 811, ECON 802, ECON 803 or ECON 822, ECON 829 and two restricted electives in Economics or Education. Students must pass all required exams in Economics, including mathematical proficiency, Microeconomic Theory, and Macroeconomic Theory. Additionally, students must pass an examination based on the first year Education Proseminar courses (EDUC 805 and EDUC 806) and EDUC 850.

#### Requirements for Admission to the Ph.D. in Economic Education Program

Students will be admitted to the program based upon enrollment availability and their ability to meet the following minimum recommended entrance requirements.

- Baccalaureate degree from an accredited college or university.
- An officially reported GRE score. Students are normally expected to have a minimum score of 1100 on math and verbal sections combined.
- An undergraduate GPA of 3.0 or higher.
- An officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) OR an officially reported minimum IELTS score of 7.0 for applicants whose native language is not English.
- A written statement of goals and objectives, including a statement that clearly identifies the applicant's interest in the program.
- Coursework in microeconomics and macroeconomics at the intermediate level or above and in statistics and mathematics (calculus) is expected. Otherwise qualified

students who lack this background may be directed to appropriate coursework to remedy this deficiency.

#### Program Requirements for the Ph.D in Economic Education Degree

1. **Course Work:** Students in this doctoral program complete the following courses: EDUC 805, EDUC 806, EDUC 850, EDUC 852, EDUC 840 (2 credits), and 6 credits of EDUC doctoral electives; ECON 801 or ECON 811, ECON 802 or ECON 812, ECON 803 or ECON 822, ECON 804 or ECON 823, ECON 820, ECON 829, and 6 credits of ECON doctoral electives. Additionally, students complete an additional 6 credits of doctoral electives selected with the approval of their advisor. All students must register for and attend ECON 890 (weekly department seminar) in two semesters and meet established course requirements.

Students who terminate their matriculation after completing the M.A. in Economic Education as a terminal degree must complete 3 credits of ECON 868 or EDUC 868 and write a research paper. This requirement does not pertain to students who continue in the Ph.D program at the conclusion of the M.A.

Nine hours of dissertation credit (EDUC 969 or ECON 969) is required of all Ph.D. students. A minimum of 63 credit hours is required to complete the Ph.D. in Economic Education program.

2. **Residency Requirement:** One year in residence (one continuous academic year—9 credit hours per semester) must be completed. Students are strongly encouraged to complete this requirement in the first year.

3. **Examinations:** Students must pass all required exams in Economics, including mathematical proficiency, Microeconomic Theory, and Macroeconomic Theory. The examinations in Microeconomics and Macroeconomics are given twice a year (January and June) and will typically be taken in the semester after the relevant coursework has been completed. Students who do not pass an examination on the first attempt may retake it two additional times.

Students must also pass an examination based on the first year Education Proseminar courses (EDUC 805 and EDUC 806) and EDUC 850. This exam will be administered at the end of the first spring semester. Students who do not pass the

examination on the first attempt may retake it one additional time prior to the beginning of the fall semester.

4. Dissertation proposal: A written proposal that is defended before one's advisory committee.

5. Dissertation and defense: An original work of scholarship, meeting School, University and professional requirements, plus an oral defense of the work.

## **Doctor Of Philosophy in Education Degree**

Telephone: (302) 831-1165

<http://www.udel.edu/education/phd/index.html>

Faculty Listing: <http://www.udel.edu/education/people/index.html>

The Doctor of Philosophy degree represents the highest level of achievement in formal education. As such, this degree signifies the attainment of an advanced level of scholarship and the possession of scholarly dispositions and habits. Individuals awarded the Ph.D. in Education by the School of Education at the University of Delaware are prepared to make significant contributions to the field of education, and they do this, first and foremost, by conducting research that answers important questions about the nature of education.

The Ph.D. program includes core coursework in two Proseminars that introduce first year students to the breadth of educational topics and inquiry, and three courses that introduce students to quantitative, qualitative, and epistemological approaches to educational research. Intensive coursework from a specialized area of knowledge provides the student with a depth of understanding that is situated in a series of research projects and studies. Specialization areas within the Ph.D. include Cognition, Development and Instruction (CDI); Curriculum Inquiry; Literacy Education; Mathematics Education; Research Methodology and Evaluation (RME); School Psychology; Science Education; Sociocultural and Communal Approaches (SCA); and Special Education. Through the Colloquium course and lecture series, distinguished visiting scholars provide students with the opportunity to discuss current topics and research.

Students may earn an MA in Education degree by successfully completing the doctoral core coursework, twelve credit hours of specialization

coursework, three credits of Colloquium and passing the Proseminar Assessment.

### **Requirements for Admission to the Ph.D. Program in Education**

Applications for admission must be received by December 15 to be considered for acceptance for the following fall semester. The specialization area to be pursued must be indicated at the time of admission as the faculty within each specialization area collectively make a recommendation regarding admission. Full-time study is strongly recommended.

- Official report of GRE scores taken within the past three years. Although there is not a minimum GRE requirement, it is expected that applicants will attain a 1050 or above on the combined verbal and quantitative sections of the exam.
- An officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) OR an officially reported minimum IELTS score of 7.0 for applicants whose native language is not English.
- An official copy of the applicant's undergraduate transcript from an accredited college or university must be submitted.
- An official copy of the applicant's graduate transcripts from an accredited college or university must be submitted if applicable. Candidates applying to the mathematics education specialization must have earned a master's degree.
- Three letters of reference from individuals who are able to assess the applicant's academic ability and potential.
- A statement from the applicant describing professional objectives and plans for accomplishing them.

It is expected that applicants will have a minimum undergraduate GPA of 3.0 (and, if applicable, a graduate GPA of 3.5). Applicants are urged to submit additional material that attests to their ability to carry out and benefit from graduate work. Those materials may include term papers, laboratory reports, publications, theses, or other examples of academic work.

### **Program Requirements For The PhD Degree**

1. Course Work: Doctoral Core coursework includes two Proseminars (EDUC 805, EDUC 806) that students take in the first two semesters of their program, and three methodology courses (EDUC 856, EDUC 850, EDUC 852) taken in the first three semesters of their program. This 17

credit hour sequence comprises the Doctoral Core.

Students must also complete a minimum of 21 credit hours of specialization area coursework from one of the following areas: cognition, development and instruction; curriculum inquiry; literacy education; mathematics education; research methodology and evaluation; school psychology; science education; socio-cultural approaches; or special education.

The research colloquia expose students to some of the foremost thinkers and researchers in the field of education. Guest scholars are invited to share their research findings with doctoral students and faculty in a setting that encourages collegiality and familiarizes students with a number of scholarly presentation styles and content areas. A one-credit course (EDUC 840) is offered each semester in conjunction with the colloquium series and students must complete a minimum of 4 credits of colloquium.

Nine hours of dissertation credit (EDUC 969) is required of all Ph.D. students, and additional coursework may be specified by a student's advisory committee as part of the student's Individual Program Plan. A minimum of 51 credit hours is required to complete the Ph.D. program.

2. Scholarly Apprenticeship Requirements consist of the following activities and requirements: participation in an annual SOE Research Forum; supervised university teaching experience; submission of a publication to a peer-reviewed journal; submission of a dissertation support grant; and presentation at a national conference in the student's area of expertise.

3. Residency Requirement: One year in residence (one continuous academic year-9 credit hours per semester) must be completed. Students are strongly encouraged to complete this requirement in the first year.

4. Examinations: All students must pass an assessment based on the work completed in the Proseminars at the end of the first year. Students must successfully pass the Proseminar Assessment before they are allowed to enroll in second year courses. Additionally, a Specialization Area Examination may be required in some specialization areas. This examination would take place after the student has passed all the required coursework for that specialization, but prior to the defense of the dissertation proposal.

5. Dissertation proposal: A written proposal that is defended before one's advisory committee.

6. Dissertation and defense: An original work of scholarship, meeting School, University and professional requirements, plus an oral defense of the work.

Doctor of Education in Educational Leadership  
Doctor of Education in Educational Leadership  
Telephone: (302) 831-1165  
<http://www.udel.edu/education/edd/index.html>  
Faculty Listing: <http://www.udel.edu/education/people/index.html>

The School of Education offers doctoral studies in Educational Leadership for practitioners at all levels of education. This part-time program offers two concentrations: Administration and Policy (ADPO); and Curriculum, Technology and Higher Education (CTHE). Candidates are ordinarily employed in administrative positions or other positions involving leadership in both K-12 and higher education (e.g., principal, department chair, curriculum coordinator, personnel or human resources director, superintendent, central office specialist, higher education program administrator, student services manager). The coursework in the Administration and Policy concentration is aligned with the professional standards of the Interstate School Leadership Licensure Consortium (ISLLC).

Requirements for Admission to the Ed.D. Program

Students are admitted once a year to the EdD program and applications for admission must be received by February 28, to be considered for acceptance for the following fall semester. To be admitted to the EdD program in Educational Leadership, candidates must satisfy the following requirements:

- Possession of a master's degree from an accredited college or university.
- Complete transcripts of prior undergraduate and graduate work from an accredited college or university must be submitted. A minimum 2.75 undergraduate gpa is expected as well as a 3.00 minimum graduate gpa.
- Complete program application with supporting materials.
- Submission of three letters of reference from individuals who are able to assess the applicant's academic potential and leadership ability.
- Submission of a current vita.
- Highly qualified applicants will be invited to participate in an on-site writing assessment.

## Program Requirements for the Ed.D. Degree

**Course Work:** A total of 54 credit hours of course work is required for the Ed.D. Students in both concentrations take 9 credit hours of Core Coursework (EDUC 824, EDUC 863, and EDUC 891) and 12 credit hours of dissertation study (EDUC 969) in fulfillment of the Executive Position Paper (EPP). Additionally, students in Administration and Policy take 27 credits of concentration coursework (EDUC 809, EDUC 810, EDUC 827, EDUC 828, EDUC 839, EDUC 879 [6 credits], EDUC 890), a 3 credit independent study with their advisor (EDUC 866) in preparation for their EPP proposal, and 6 credits of restricted electives. Students in Curriculum, Technology and Higher Education take 12 credits of concentration coursework (EDUC 665 or EDUC 819, EDUC 818, EDUC 850, EDUC 860 or EDUC 897) and 21 credits of restricted electives in the student's area of content knowledge expertise or area of employment responsibilities/expertise.

Advancement to doctoral candidacy, including the successful defense of the EPP proposal.

Development and successful oral defense of the Executive Position Paper.

## Master of Arts Degrees: (M.A.)

Telephone: (302) 831-1165

<http://www.udel.edu/education>

Faculty Listing: <http://www.udel.edu/education/people/index.html>

### Teaching (M.A.T.)

The Master of Arts in Teaching (MAT) degree is intended for students who wish to become certified in teaching at the secondary level (grades 6-12) in a single subject. Students will learn how to lead a classroom, plan lessons, assess student learning, reflect on their own teaching, and improve their practice over time. The program will prepare students to teach Science (specialized by content area), Mathematics, or English. This one-year, cohort program begins in the summer and students complete the program at the end of the following spring semester. Students complete a year-long internship with a partner school to gain intensive classroom experience by the time they complete the program. Students in this program will have an academic major or at least 30 credit hours of undergraduate coursework in the subject they wish to teach.

Requirements for Admission to the M.A.T. Degree

Applicants are admitted to this cohort-based program once a year, with completed applications due by December 15 for admission in the following summer. Complete program application including a statement of goals and objectives.

- Baccalaureate degree with a minimum undergraduate cumulative index of 3.0 from an accredited college or university in the concentration area to which the student is applying (Mathematics, Science or English).
- Passing scores in all categories (Reading, Writing, Mathematics) of the Praxis I test.
- Passing score on the Praxis II (content knowledge) test relevant to the student's concentration/specialization area.
- A score of at least 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) on the Test of English as a Foreign Language (TOEFL), or a minimum overall score of 7.0 on the IELTS from applicants whose first language is not English.
- Three letters of reference from individuals who are able to assess the applicant's academic ability and potential.

## Program Requirements for the M.A.T. Degree

This M.A.T. program requires 33 credit hours of course work, including:

Education Core Courses (18 hours): EDUC 613, EDUC 614, EDUC 619, EDUC 622, EDUC 658 and EDUC 638.

Concentration Courses (9 hours): EDUC 641 or 603 or 634; EDUC 696 or 604 or 635; EDUC 751 or 752 or 636.

Graduate Teaching Internship (6 credits): EDUC 750

Additionally, the M.A.T. candidate will complete a professional portfolio (the Teachers Work Sample), showcasing examples of their lesson plans, their students' work, and other artifacts that demonstrate their understanding of pedagogy in their chosen concentration. This portfolio must meet all relevant requirements for use as an NCATE assessment.

### Teaching English As A Second Language (TESL)

The M.A. in Teaching English as a Second Language (TESL) program prepares students for teaching in ESL classrooms, and also provides training for teaching English as a second language in colleges and language institutes in the U.S. and abroad. Students are strongly encouraged to pursue the degree as full-time students, and all students will complete either a

practicum or a graduate teaching internship.

### Requirements For Admission To The TESL Program

Applicants are admitted to this cohort-based program once a year, with completed applications due by April 1 for the following fall semester. If unusual circumstances exist, a student may petition to have his/her application reviewed for spring semester admittance by contacting Dr. Scott Stevens (sstevens@udel.edu) by October 1. If the petition is approved, the completed application must be received by November 1.

- Complete program application including a statement of goals and objectives.
- A minimum undergraduate cumulative index of 3.0 from an accredited college or university.
- A minimum graduate cumulative index of 3.5 from an accredited college or university for all graduate courses completed.
- GRE quantitative and verbal test scores must be submitted. Although there is not a minimum GRE requirement, it is expected that applicants will attain a 1050 or above on the combined verbal and quantitative sections of the exam.
- An officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) OR an officially reported minimum IELTS score of 7.0 for applicants whose native language is not English.
- Three letters of reference from individuals who are able to assess the applicant's academic ability and potential.

### Program Requirements For The MA In TESL Degree

This M.A. program requires 33 credit hours of course work, including:

Education Core Courses (12 hours): EDUC 613, EDUC 619, EDUC 627, and EDUC 740

Linguistics and TESL Courses (18 hours): LING 676, LING 677, FLLT 622, FLLT 624, EDUC 672, and EDUC 647

Teaching Practicum (EDUC 742 - 3 credits) for students not seeking certification; OR Graduate Teaching Internship (EDUC 750) (6 credits) plus EDUC 614 (3 credits) for students seeking certification as a classroom teacher. All students must take the Praxis II exam in TESL prior to being allowed to begin their Practicum or Graduate Teaching Internship. Additionally, students seeking certification to teach in U.S. schools must take the Praxis I exam as a pre-requisite to the Graduate Teaching Internship.

### Combined BA/MA Program (English/Teaching English as a Second Language)

Exceptionally well qualified undergraduate English majors may apply for the 4 + 1 program which would culminate with the student earning a BA in English and an MA in Teaching English as a Second Language within five years. English majors who have a minimum overall GPA of 3.2 with a minimum 3.0 in their major may apply to the MA in Teaching English as a Second Language in the fall of their junior year by completing the University's graduate application. One of the three reference letters that is required as a part of the application must come from their English department faculty advisor. The MA-TESL is a competitive program and not all students who meet the minimum admission requirements will be admitted. Students admitted to the 4 + 1 program will be allowed to enroll in the following four graduate courses and count them towards their bachelor's degree: LING 676, EDUC 672, ENGL/LING 677, and EDUC 619. Once admitted to the 4 + 1 program, students must maintain a minimum 3.0 overall GPA and earn a grade of "B" or higher in the four designated TESL courses they take as an undergraduate. During the fifth year, students will take the remaining 21 credits of graduate coursework required in the TESL program.

### School Psychology (MA, EdS)

Telephone (302) 831-1165

<http://www.udel.edu/education/masters/psychology/index.html>

Faculty Listing: <http://www.udel.edu/education/people/>

The School of Education offers a comprehensive master's/educational specialist degree program to prepare graduates for professional certification in school psychology. The program trains students in (1) direct intervention skills, including counseling and applied behavioral analysis, (2) psychoeducational evaluation of children, using a variety of assessment and diagnostic approaches, (3) prevention, (4) consultation with parents, teachers, and school administrators, and (5) evaluation and research in school settings. The program is approved by the National Association of School Psychologists (NASP). Therefore, students completing the program will qualify for school psychology certification in Delaware and most other states.

### Requirements for Admission to the School Psychology Program

Admissions are made once each year in the

School Psychology Program, with application materials due by February 1.

A minimum undergraduate cumulative index of 3.0 from an accredited college or university.

A minimum graduate cumulative index of 3.5 from an accredited college or university.

GRE Quantitative and Verbal Test scores must be submitted. Although there is not a minimum GRE requirement, it is expected that applicants will attain a 1050 or above on the combined verbal and quantitative sections of the exam.

An officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) OR an officially reported minimum IELTS score of 7.0 for applicants whose native language is not English.

Three letters of reference from individuals who are able to assess the applicant's academic ability and potential.

Complete program application including a written goal statement and interview with program faculty in which dispositions consistent with the goals of the program are assessed.

#### Program Requirements For The MA and EdS in School Psychology

Program requirements total 60 graduate credit hours. These include a one-year (30 hours) Master of Arts degree, followed by an additional 30 credits leading to the Educational Specialist Degree in School Psychology. For the overall sequence, course work and associated field work account for 54 credit hours, the equivalent of approximately two years of full-time study. The remaining 6 credit hours are devoted to a supervised 1,200-hour internship. Full-time study is required.

Required coursework includes the following:

Coursework required for the MA degree (30 cr. hrs.): EDUC 618, EDUC 623, EDUC 663, EDUC 671, EDUC 679, EDUC 691, EDUC 744, EDUC 814, EDUC 817, and EDUC 830.

Coursework required for the EdS degree (30 cr. hrs.): EDUC 651, EDUC 671 (6 cr. hrs.), EDUC 813, EDUC 831, EDUC 841, EDUC 842, EDUC 870, plus Internship in School Psychology (EDUC 688) (6 cr. hrs.).

#### **Master of Education Degrees (M.ED.)**

Telephone: (302) 831-1165

<http://www.udel.edu/education>

Faculty Listing: <http://www.udel.edu/education/people/index.html>

The School offers a Master of Education (M.Ed.) degree program with majors in Educational Technology; Exceptional Children and Youth; Higher Education Administration; Reading; and School Leadership.

#### Major in Educational Technology

The Master of Education in Educational Technology is a degree program designed for individuals who seek both a theoretical and a practical grounding in educational technology methods and techniques, emphasizing theories of teaching and learning that support these methods. Based on the assumption that new media and the Internet can have a positive effect on teaching and learning, this program is designed for individuals who want to use technology to make a positive impact on the future of schooling. Those interested in applying to the program must provide the School of Education faculty with evidence of a strong academic background representing both breadth and depth in their content area and experience with technology. Due dates for receipt of completed applications are April 1 for admission for the Fall semester, and November 1 for admission for the Spring semester.

#### Requirements for Admission to the M.Ed. in Educational Technology

- A bachelor's degree in a field relevant to the applicant's proposed program. An undergraduate GPA of 3.0 or higher from an accredited college or university.
- A minimum score of 600 on the TOEFL (paper-based test) or 250 (computer-based test) or 100 (iBT), or a minimum overall score of 7.0 on the IELTS from applicants whose first language is not English.
- Three letters of reference from individuals who can assess the applicant's academic ability and potential.
- A complete program application including a written statement of goals and objectives.

#### Program Requirements for the M.Ed. in Educational Technology

Core courses (6-9 credits) including courses in curriculum theory (EDUC 640) and research (EDUC 600 or EDUC 607).

Specialization courses (9 credits) in educational technology: EDUC 650, Technology and Cognition; EDUC 685, Multimedia Literacy; and EDUC 638, Learning Technologies across the Curriculum.

Restricted electives (12-18 credits)

in educational technology. For specific requirements in this area please see <http://www.udel.edu/education/edtc/ProgramOfStudy.html>

Students complete a Master's Comprehensive Examination or a research paper or a Master's Thesis to graduate from this program. This decision is made in consultation with the student's faculty advisor.

### Major in Exceptional Children and Youth

This program is a unique noncategorical program that provides advanced training for teachers, education consultants, educational diagnosticians, and technology specialists. Eight concentrations, representing different focus areas and certification tracks, are offered in the program as indicated in the table below. Focus areas include: (1) Elementary Special Education, (2) Secondary Special Education, (3) Special Education Technology, and (4) Severe Disabilities Certification tracks include: (1) the Masters Program (EEC) advanced degree only track for teachers with an initial teaching certificate in special or general education or those not intending to pursue certification, (2) the Masters Plus Certification Program (MPCP) track for those seeking an initial teaching certificate in addition to the degree, and (3) a dual certification (4+1) program track for secondary education undergraduates seeking an advanced degree and certification in special education.

#### Certification Tracks/Focus Areas Advanced Degree Only

(M.Ed.) Masters Plus Certification Program

(M.Ed. plus initial certification)  
Dual Certification for Secondary Education  
Undergraduates

(Bachelor's plus M.Ed. and second certification)

Elementary EEC ELEM	
MPCP ELEM	n/a

Secondary EEC SEC	
MPCP SEC 4 + 1 SEC	

Severe Disabilities/Autism	EEC
SD/Autism MPCP	
SD/Autism n/a	

Special Education Technology	EEC
SET n/a	n/a

Due dates for receipt of completed applications for the three tracks are:

M.Ed. advanced degree only: April 1 for admission in the subsequent Fall semester, and November 1 for admission in the subsequent Spring semester.

MPCP: February 15 for admission the following summer.

4+1 dual certification: January 15 of junior year for admission in the subsequent Fall semester.

#### Requirements for Admission to the M.Ed. in Exceptional Children and Youth

A minimum undergraduate cumulative index of 3.0 from an accredited college or university. '4+1' track applicants must successfully complete EDUC 415 (1 credit) Special Education Practicum prior to their senior year.

A minimum graduate cumulative index of 3.5 (if applicable) from an accredited college or university.

An officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) OR an officially reported minimum IELTS score of 7.0 for applicants whose native language is not English.

Uncertified applicants must submit passing scores on the Praxis I exam consistent with the Delaware Department of Education requirements.

Three letters of reference from professors or supervisors who can attest to the applicant's academic ability and potential.

A completed program application including a statement of professional objectives that specifies intended focus area and certification track

A 500 word essay on a special education topic. For more information on this admission requirement please see <http://www.udel.edu/educ/graduate/masters/exceptional/index.html>

#### Program Requirements for the M.Ed. in Exceptional Children and Youth

Program Requirements for persons who enter the M.Ed. degree only track include:

Required Core Courses (18 credit hours): EDUC 623; EDUC 679 or 625 or 674; EDUC 680; EDUC 681; EDUC 682; and EDUC 745.

Focus Area Coursework (15 credit hours): Students will complete 15 credit hours of focus area coursework in one of the following areas: Elementary, Secondary, Special Education Technology, or Severe Disabilities. Focus area courses are selected jointly by the student and

her/his advisor.

Final Paper or Thesis: In addition to coursework, students will pursue either a Final Paper or a Master's Thesis as a final demonstration of learning.

Persons who enter the MPCP track (no prior certification) must meet four additional program requirements in order to be eligible for certification:

Complete background courses in addition to the 33 graduate credits. Depending upon the student's prior academic program, these courses generally include courses in literacy/reading, mathematics, and education of the exceptional child;

Choose a focus area of Elementary Special Education, Secondary Special Education, or Severe Disabilities/Autism and complete their 15 credits of focus area courses in one of these three areas;

Students seeking initial certification must show evidence of having taken a state-designated content area knowledge test (e.g., Praxis II) no later than when they have completed 27 credit hours in the program; and

Complete the Graduate Teaching Internship (EDUC 750), including related Final Papers.

Program requirements for the '4+1' track include:

During the Senior year complete 9 graduate credits (EDUC 680, 673, 757) in lieu of 9 undergraduate credits, and complete all remaining undergraduate requirements, including secondary education student teaching in a content area.

During the +1 year complete 18 graduate credits (EDUC 658, EDUC 681, EDUC 674, EDUC 745, EDUC 682, EDUC 646

6 credits of graduate teaching internship (EDUC750)

Complete a non-course Final Paper requirement.

For more information about specific course requirements as well as information about the Final Paper and Masters Thesis, please consult the Program Guidelines on the web at <http://www.udel.edu/educ/graduate/masters/exceptional/index.html> or by calling (302) 831-1165.

### Major in Higher Education Administration

The Master of Education in Higher Education Administration is a 33 credit hour program for individuals seeking professional advancement

and leadership development in a higher education environment. Although most students enroll in this program on a part-time basis, it is also possible to complete the program as a full-time student. The curriculum draws upon candidates' work experience to integrate theory and practice as it prepares them for positions of leadership in traditional colleges and universities, non-traditional post-secondary institutions, and adult and continuing education programs within corporate or higher education settings. Within this degree program, a specialization in sports administration and management is available for individuals seeking professional positions in athletic administration or coaching at the university or secondary level.

### Requirements for Admission to the M.Ed. Program in Higher Education Administration

Students are admitted to this major twice a year with an application deadline of November 1 for spring semester admission and April 1 for fall semester admission.

A complete program application including a written statement of goals and objectives.

An minimum undergraduate cumulative index of 2.75 or higher from an accredited college or university.

A minimum graduate cumulative index of 3.0 or higher (if applicable) from an accredited college or university.

An officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) OR an officially reported minimum IELTS score of 7.0 for applicants whose native language is not English.

Three letters of reference from individuals who can assess the applicant's academic ability and potential as well as their leadership qualities.

### Program Requirements for the M.Ed. In Higher Education Administration

The M.Ed. in Higher Education Administration requires 33 credits of coursework, including:

General Core Courses (24 credits): EDUC 607, EDUC 670, EDUC 699, EDUC 818, EDUC 849, EDUC 883, HDFS 688, and HDFS 689.

Elective Requirements (6 credits): Six credits of electives chosen with the approval of the student's advisor. Recommended electives include the following courses for students interested in sports administration and management: KAAP 616, KAAP 620, KAAP 634, KAAP 635, KAAP 647. Additional electives may include: HDFS 683, HDFS 692, and EDUC 847.

Higher Education Internship (3 credits). All

students are required to complete the graduate course, EDUC 743 Internship in Higher Education Administration. A portfolio is required for this internship.

### Major in Reading

The Master of Education in Reading leads to state certification as a Reading Specialist. It is designed for teachers with initial licensure and at least 3 years teaching experience by the time they graduate. Candidates completing this program will be granted certification by the State of Delaware Department of Education and 30+ other states with which the state holds reciprocity agreements. The program was developed in accordance with the International Reading Association Standards for Literacy Professionals and the State Standards of Delaware and is nationally accredited through NCATE. It focuses on classroom teaching, intervention with students who struggle with reading, and the management and assessment of reading programs. The program includes three supervised practica in assessment and instruction of students with difficulties with literacy.

### Requirements for Admission to the M.Ed. Program in Reading

Applicants are admitted to this program once a year, with completed applications due by April 1 for admission in the following fall semester.

A bachelor's degree from an accredited college or university.

An undergraduate GPA of 3.0 or higher.

An officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) OR an officially reported minimum IELTS score of 7.0 for applicants whose native language is not English.

Three letters of reference from individuals who are able to assess the applicant's academic ability and potential.

A complete program application including a written statement that clearly identifies the applicant's goals within the program.

Demonstrated knowledge of the teaching of oral language, reading, and writing through previous coursework and teaching.

### Program Requirements for the M.Ed. in Reading

Coursework: The M.Ed. in Reading requires 33 credits of graduate-level coursework. The required coursework includes: EDUC 601, either EDUC 602 or EDUC 603, EDUC 604, EDUC 608,

EDUC 609, EDUC 622, EDUC 630, EDUC 631 and either EDUC 649 or EDUC 617. There are no elective courses in this program.

Candidates must complete the following courses, and the course-embedded projects, in the prescribed order: EDUC 608, EDUC 609, EDUC 630. Other required courses and embedded projects may be completed in any order, with the exception that EDUC 617 or EDUC 649 must be taken within the last six credits hours of the program.

Examinations: Prior to exit from the program, all candidates are required to provide evidence of their competence through the completion of a comprehensive examination.

Projects and portfolio: At two designated points in the program, candidates must submit course projects and portfolio requirements in accordance with program guidelines. Detailed information on this requirement will be given to all candidates at the time of admission to the program.

### Major in School Leadership

This program is for individuals seeking Delaware certification as a principal or assistant principal. This part-time, evening/weekend degree program is designed for people who are employed full-time in PK-12 settings. The curriculum draws upon candidates' work experience to integrate theory and practice as it prepares them for positions of school leadership in educational settings. Coursework in this program aligns with the Interstate School Leadership Licensure Consortium (ISLCC) standards. Therefore, students who complete the program will qualify for School Leader I certification.

### Requirements for Admission to the M.Ed. Degree in School Leadership

Applicants are admitted to this cohort-based program once a year, with completed applications due by February 28 for admission the following summer.

Baccalaureate degree from an accredited college or university.

Transcripts showing an undergraduate GPA of 2.75 or higher. Applicants with lower than expected performance are not automatically disqualified, but should provide an explanation for their prior performance and describe the experiences, skills, and dispositions they believe indicate the ability to succeed at the graduate level.

Transcripts showing a minimum GPA of 3.0 for

all graduate courses completed (if applicable). This GPA applies to graduate level courses taken through continuing education or graduate programs at the University of Delaware and other institutions.

Three letters of recommendation. One letter must come from an immediate supervisor (e.g., principal), and the other two may come from a faculty member or another individual who is familiar with the quality of the applicant's academic ability and potential for school leadership. Letters from friends and family are strongly discouraged.

An officially reported minimum TOEFL score of 600 (paper-based test) or 250 (computer-based test) or 100 (iBT) OR an officially reported minimum IELTS score of 7.0 for applicants whose native language is not English.

A written statement of goals and objectives. This three-question essay response is part of the standard Graduate Studies application and should explain why the applicant wishes to pursue a MED in School Leadership.

#### Program Requirements for the M.Ed. in School Leadership

**Coursework:** The MEd in School Leadership requires 33 credits of graduate-level coursework. The required coursework includes: EDUC 661, EDUC 664, EDUC 693, EDUC 733, EDUC 734, EDUC 735, EDUC 736, EDUC 737, and EDUC 738.

**Internship:** Students complete a 6-credit Internship (EDUC 739). The Internship requires students to engage in authentic, leadership-related field experiences in approved school settings. A portfolio is required as part of this internship.

**Non-registered degree requirements:** Before enrolling in the internship (EDUC 739), students must submit School Leadership Licensure Assessment (SLLA) scores to the Graduate Programs Director of the School of Education. Students will not be allowed to graduate from this degree program unless they have submitted their scores for this test.

### **Master of Instruction Degree (M.I.)**

(302) 831-1165

The Masters of Instruction degree is a 33 credit hour program for practicing teachers with a portfolio capstone experience. The program strengthens teachers' capacity to study and improve their own practice and supports application for National Board Certification. Concentrations in School Library Media and Agriculture Education and a specialization in Educational Technology are available through

this program by completing designated coursework in any of these areas.

Requirements for Admission to the M.I. Program Students are admitted to this program three times a year, with completed applications due by November 1 for admission in the subsequent Spring semester, February 1 for admission in the subsequent Summer session, and April 1 for admission in the subsequent Fall semester.

- Evidence of current employment as a teacher.
- Three letters of reference from individuals who are able to assess the applicant's instructional competencies, personal characteristics, and attitudes toward teaching.
- A completed program application including a statement of professional goals with a supervisor's signature indicating that the supervisor agrees that the goals specified are reasonable for this applicant and will improve the quality of instruction in the applicant's classroom.
- An MI Program Application Supplement, found online at: <http://www.udel.edu/education/masters/instruction/applying.html>
- A minimum 2.5 undergraduate GPA from an accredited college or university

#### Program Requirements for the M.I. Program

This M.I. program requires 33 credits of coursework, including:

##### 1. General Core Courses (12 hours):

Study of Teaching (3 cr.):

EDUC 600 or EDUC 629

Academic Assessment (3 cr.):

EDUC 605 or EDUC 680

Classroom Management and Motivation (3 cr.):

EDUC 658 or EDUC 681

Models of Instruction (3 cr.):

EDUC 627 or EDUC 640

##### 2. Specialization/Individualized Courses (18 credits).

Students take 18 credit hours of coursework, selected with the assistance of their faculty advisor, to address the specific program goals identified by the applicant at the time of admission. Students may take courses in a specific content area such as literacy, mathematics, social studies, or science and/or they may take specific courses to enhance their teaching expertise such as courses in classroom management or English as a Second Language.

A concentration in School Library Media (SLM) may be obtained through selected coursework

in this area. Courses required for the SLM concentration include: EDUC 602, EDUC 603, EDLM 621, EDLM 622, EDLM 625, and EDLM 628.

A concentration in Agriculture Education may be obtained through selected coursework in this area. Courses required for the Agriculture Education concentration include: AGED 626, AGED 630, FREC 682, STAT 608, and 6 additional credits of restricted elective courses approved by the faculty advisor for this concentration.

A specialization in Educational Technology may be obtained through selected coursework in this area. For more information on this specialization area coursework, please see <http://www.udel.edu/fth/masters/edtechmi.html>

3. Masters Portfolio (3 cr.): EDUC 648 (1 cr.), EDUC 748 (1 cr.), and EDUC 769 (1 cr.) The first portfolio course (EDUC 648) must be taken in the first term that the student is enrolled in the program.

## Evaluation (MS)

Telephone: (302) 831-6872

### PROGRAM OVERVIEW

The Master of Science in Evaluation prepares professionals for the successful design, implementation, and management of program, policy, and organizational evaluation. Students are prepared in the science and art of evaluation. The specific skills that will be developed are: identifying evaluation needs, negotiating evaluation questions, developing program models, designing evaluation studies that are responsive to information needs, and carrying out and reporting the results of these studies in ways that improve the ability of programs, policies, and organizations to address social problems. The program grounds these skills in the theoretical foundations for evaluation and the ethical principles of evaluation practice.

The program is designed to meet the needs of both traditional graduate students and working professionals, with graduates having the skills and knowledge to work with a wide variety of populations and in diverse settings. The program provides opportunity to pursue specific areas of emphasis within Evaluation, including (but not limited to): measurement, quantitative design and analysis, qualitative evaluation, economic evaluation, or customized study focused on a specific program area.

### REQUIREMENTS FOR ADMISSION

NOTE: The Master of Science in Evaluation is

currently under review and is not accepting applicants at this time. For more information email [ljcooksy@udel.edu](mailto:ljcooksy@udel.edu).

Students will be admitted to the program based upon enrollment availability and their ability to meet the following entrance requirements.

- Applicants must have a minimum of a baccalaureate degree. Evaluation is an interdisciplinary field, so the discipline in which the applicant received his or her degree is not necessarily a decisive factor in admissions.
- Applicants must submit a written statement of the reasons for their interest in evaluation, their motivation to pursue a graduate degree, and their professional goals and objectives.
- Applicants should have an overall undergraduate Grade Point Average (GPA) of 3.0 or higher (on a scale of 4.0 = A).
- Applicants should have a GPA of 3.2 or higher in their undergraduate major.
- Applicants must take the Graduate Record Exam (GRE), which will be evaluated as part of the overall admissions process. A minimum GRE score of 1100 is required for admission, but may be waived.
- If English is not an applicant's first language, applicants from abroad must demonstrate a satisfactory command of English. The TOEFL (Test of English as a Foreign Language) is required of all foreign applicants. A minimum score of 600 (paper-based test), 250 (computer-based test), or 100 (TOEFL iBT) is required for consideration for admission.
- Applicants must request letters of recommendation from three (3) people familiar with the candidate's academic record and/or professional achievement.

Admission is selective and competitive, based on the number of well-qualified applicants and the limits of available faculty. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. See the Admission Information chapter in this catalog for additional information.

### REQUIREMENTS FOR THE DEGREE

The Master of Science in Evaluation requires 37 credit hours of coursework at the 600, 700, and 800 level. The 30 credits of coursework must include 25 credits of required courses, and 12 credits of advisor approved coursework.

Credit Requirements:  
Core Credits (Areas A + B)

Area of Emphasis (Area C)	6
Electives (Area D, advisor approved)	6
Total number of required credits	37

#### Area A: Required Courses

HDFS 637/EVAL 637	Program Planning, Assessment, & Evaluation	3
EVAL 755	Evaluation Models and Approaches	3
EVAL 756	Advanced Seminar in Evaluation 3	
EVAL 757	Special Projects	2
EVAL 758	Portfolio and Competency Analysis Paper	1
Total Credits from Area A		12

#### Area B: Courses Required From Other Programs

EDUC 865	Educational Measurement Theory	3
or		
HDFS 655	Measurement Techniques for Children & Families	3

#### Research Methods

EDUC 607	Educational Research Procedures	3
or		
HDFS 815	Research Issues & Designs	
or		
UAPP 800	Research Methods & Data Analysis	3

#### Statistics

EDUC 665	Elementary Statistics	3
or		
UAPP 815	Public Management Statistics	3

#### Qualitative Methods

EDUC 850	Qualitative Research in Educational Settings	3
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#### Survey Design

UAPP 676	Survey Research	1
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Total Credits from Area B 13

#### Area C. Area of Emphasis [6 credits to be selected with approval of advisor]

Qualitative Methods		6
UAPP 804	Qualitative Methods for Program Evaluation	
EDUC 858	Advanced Qualitative Methods	

#### Quantitative Methods

EDUC 812	Regression and Multivariate Models in Education	
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EDUC 856	Introduction to Statistical Inference
EDUC 862	Design and Analysis of Experiments
EDUC 874	Multivariate Data Analysis

#### Economic Evaluation

UAPP 834	Economics in Public and Nonprofit Sectors
UAPP 827	Program and Project Analysis

Total Credits from Area C 6

#### Area D. Electives

6 credits in a program area to be selected with approval of advisor 6

Program areas include, but are not limited to:

Adult Education (EDUC 670, EDUC 699, EDUC 883)

Community Development (UAPP 608, UAPP 639, UAPP 645)

Family Services (HDFS 670, HDFS 850, HDFS 855, HDFS 870, HDFS 875)

Management (UAPP 819, UAPP 684).

Policy analysis (UAPP 806, UAPP 652)

Total Credits from Area D 6

### Human Development and Family Studies

Telephone: (302) 831-6500

Dr. Bahira Sherif Trask, Coordinator

<http://www.hdfs.udel.edu>

Faculty Listing: <http://www.hdfs.udel.edu/content/faculty>

The Department of Human Development and Family Studies offers programs leading to the Master of Science and Doctor of Philosophy degrees in Human Development and Family Studies. All graduate programs offer a strong interdisciplinary background with an emphasis on risk, resiliency, diversity, and relationships in a changing society. All programs also provide background in family systems and the relationship of the family and its members to other systems across the life course.

At the Master's and Ph.D. level in Human Development and Family Studies, students focus on research and evaluation in applied human development and family studies. These degrees require the completion of a thesis.

#### Requirements For Admission

The qualifications of each applicant are weighed against the Department's general criteria and on the particular program or concentration to which the applicant has applied. All admissions are competitive and determined by the number

of available vacancies, the qualifications of applicants, and availability of faculty. In special cases, provisional admission to these programs may be offered with specific requirements needing to be met prior to receiving regular standing. Applicants are advised to submit all application materials by February 1 for admission to the program beginning in the Fall of the following academic year. See Graduate Admissions for additional information.

#### Admission Requirements for MS and PhD

Admission to the HDFS graduate programs is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. Both full-time and part-time applicants are considered for admission.

- An undergraduate cumulative average of at least 3.0 and a major cumulative average of at least 3.25. The cumulative average of prior graduate study is expected to be at least 3.5. Complete transcripts of prior undergraduate and graduate work must be submitted.
- Submission of three letters of reference from individuals able to assess the applicant's academic potential.
- A match between the candidate's statement of objectives and interests and the department's capacity and available mentors.
- A score of at least 600/250/100 on the Test of English as a Foreign Language (paper-based TOEFL, computer-based TOEFL, IBET/TOEFL) from applicants whose first language is not English.
- All applicants must submit GRE scores. A minimum GRE score (math plus verbal) of 1050 is expected of PhD applicants.
- Applicants to the PhD Program are required to possess a master's degree from an accredited institution.
- All candidates are encouraged to have a personal interview.

### Master of Science: Human Development and Family Studies (MS)

Telephone: (302) 831-6500

<http://www.hdfs.udel.edu/content/human-development-and-family-studies-graduate-programs>

Faculty Listing: <http://www.hdfs.udel.edu/content/faculty>

The MS program in Human Development and Family Studies focuses on the relationship of the family and its members to other systems across the life span. The minimum total credits for the MS in Human Development and Family Studies is 30-36. Requirements are listed below.

HDFS 601	Theories of Human Development	3	
HDFS 615	Research Methods	3	
HDFS 621	Family Studies I: Empirical & Theoretical Perspectives	3	
EDUC 665	Elementary Statistics*	3	
600/800	Level Statistics course	3	
HDFS 600/800			
Elective	3		
600/800	Level Interest Electives	6**	
HDFS 869	Thesis	6	

TOTAL 30-36

\*Courses must be focused on the delivery of services to individuals and disabilities or in risk situations and/or their families. These services can include residential, employment, health and medical, transportation, family support or other specific services.

\*\*Substitution for EDUC 665 needs approval from the Advisor.

#### MS Concentration in Human Services Leadership

Concentration: Human Services Leadership (15 credits)

Choose 5 courses, in consultation with your Academic Advisor, from the following list:

HDFS 637	Program Planning, Assessment and Evaluation	3	
HDFS 642	Leadership in Human Services	3	
HDFS 669	Supervised Field Experience	3	
UAPP 692	Environmental Values, Movements and Policies	3	
UAPP 694	Financial Management in Public & Nonprofit Sectors	3	
UAPP 693	Economics in Public & Nonprofit Sectors	3	
UAPP 697	Leading Organizations in Public and Nonprofit Sectors	3	
UAPP 696	Human Resources in Public and Nonprofit Organizations	3	

#### COMBINED 4+1 BS in Human Services/MS in Human Services Leadership

The four-year curriculum for the Bachelor of Science in Human Services contains required graduate courses that prepare the student for

the Master in Science curriculum. With this 4+1 plan and the proper scheduling of MS classes, students may enter immediately into the MS program full-time with the possibility of completion within one year.

UD Human Services (BS) undergraduate majors who are provisionally granted admission to the 4+1 MS HDFS program/Human Services Concentration and subsequently admitted to the MS HDFS program can waive the requirement to take a) HDFS 470 or HDFS 475 by completing HDFS 601, b) HDFS 422 by completing HDFS 621, and c) HDFS 449 (3 credits) by taking HDFS 669 (3 credits). For any undergraduate course requirement to be waived, the student needs to earn a grade of B (3.0) or better in the corresponding HDFS graduate course. In addition, students who are provisionally approved can take up to three additional 3-credit graduate courses, while an undergraduate student, toward the 33 credit MS requirement. Refer to [www.hdfs.udel.edu](http://www.hdfs.udel.edu) for information about application procedures for provisional admission.

**MS Concentration in Early Childhood Development and Inclusive Education**

HDFS 637 Program Planning, Assessment and Evaluation 3  
 HDFS 600/800  
 Interest Electives in Early Childhood Education 12  
 HDFS 869 Thesis or Field Experience with project/portfolio 6

**Master’s program timelines:**

Completion of required course work. Including interest electives are chosen by the student in consultation with the student’s Advisor and Committee.

A written proposal for the thesis is defended before the student’s committee. The committee consists of a student’s advisor and two members of the HDFS faculty. In addition, the student may choose a committee member from outside the department.

Defense: A presentation and oral defense is required for all the thesis.

**Human Development and Family Studies (PhD)**

Telephone: (302) 831-6500  
<http://www.hdfs.udel.edu/content/human-development-and-family-studies-graduate-programs>

Faculty Listing: <http://www.hdfs.udel.edu/content/faculty>

The PhD program in Human Development and Family Studies focuses on applied theory and research related to families from an interdisciplinary perspective. Emphasis is placed on issues relating to relationships among family members and the relationship of the family system to other systems in society. The PhD in Family Studies requires a minimum of 72 credits beyond the baccalaureate degree or a minimum of 42 credits for students entering with a master’s degree. Core requirements are listed below.

HDFS 601	Theories of Human Development	3
HDFS 803	Human Development in Life Span Perspective	3
HDFS 815	Research Issues and Designs	3
EDUC 856	Introduction to Statistical Inference	3
EDUC 812	Regression & Structural Equation Modeling	3
600/800	Level Qualitative or Quantitative Methods	3
HDFS 621	Family Studies I: Empirical and Theoretical Perspectives	3
HDFS 855	Family Studies II: Analysis and Critical Issues	3
600/800*	Area of Emphasis	9
HDFS 969	Dissertation	9
TOTAL	42	

\*The Area of Emphasis is selected in consultation with the student’s advisor and committee in planning a program of study.

**PhD program timelines:**

After completion of required course work, the student must pass a written and oral examination covering three areas of concentration: family studies, research methodology and statistics, and an area of emphasis as determined by the student and advisory committee. Failed exams may be retaken once but students must wait 6 months before a re-examination is permitted.

Residency Requirement: Students must meet the University requirement of one year in residence (one continuous academic year - 9 credit hours per semester).

The student must submit a written dissertation proposal that is defended before the student’s dissertation committee. The dissertation committee consists of a student’s advisor and at least two members of the graduate HDFS faculty. The committee must have no fewer than four

(4) and no more than six (6) faculty members. The majority of the committee, including the chair must be within the HDFS Department. A minimum of one (1) committee member must be from outside the HDFS Department. See Office of Graduate and Professional Education website.

Dissertation and defense: Students must submit an original work of scholarship, meeting Department, University, and professional requirements, and successful oral defense of the dissertation.

**COMBINED 4+1 BS IN HUMAN SERVICES/MS IN HUMAN SERVICES LEADERSHIP PROGRAM**  
**COMBINED 4+1 BS in Human Services/MS in Human Services Leadership**

The four-year curriculum for the Bachelor of Science in Human Services contains required graduate courses that prepare the student for the Master in Science curriculum. With this 4+1 plan and the proper scheduling of MS classes, students may enter immediately into the MS program full-time with the possibility of completion within one year.

UD Human Services (BS) undergraduate majors who are provisionally granted admission to the 4+1 MS HDFS program/Human Services Concentration and subsequently admitted to the MS HDFS program can waive the requirement to take a) HDFS 470 or HDFS 475 by completing HDFS 601, b)HDFS 422 by completing HDFS 621, and c) HDFS 449 (3 credits) by taking HDFS 669 (3 credits). For any undergraduate course requirement to be waived, the student needs to earn a grade of B (3.0) or better in the corresponding HDFS graduate course. In addition, students who are provisionally approved can take up to three additional 3-credit graduate courses, while an undergraduate student, toward the 33 credit MS requirement. Refer to [www.hdfs.udel.edu](http://www.hdfs.udel.edu) for information about application procedures for provisional admission

**Graduate Certificate in Early Language and Literacy**  
**Certificate in Early Language and Literacy**

The Graduate Certificate in Early Language and Literacy is designed for early care and education professionals desiring expertise in early language and literacy education for children from birth through age five. All coursework emphasizes early language and literacy development within the context of programs serving children and families from diverse socioeconomic and language backgrounds.

Required coursework emphasizes 1) knowledge and skills to work with families and early childhood programs to support early language and literacy development, 2) knowledge and skills to teach early language and literacy through the developmentally appropriate and research-based practices, and 3) knowledge and skills to work with children and families from diverse socioeconomic and language backgrounds.

**COURSE REQUIREMENTS**  
**CREDITS**

Family		
HDFS 621	Family Studies I: Empirical & Theoretical Perspectives	
or		
HDFS 647	Family Partnerships in Early Childhood Care and Education	3
Early Language and Literacy Foundations		
HDFS 606	Early Childhood Literacy Skill Development	3
Staff Development		
HDFS 656	Professional Development & Supervision	3
Early Language and Literacy Curriculum		
HDFS 667	Early Childhood Literature	
or		
EDUC 601	Language Development in the Classroom	
or		
EDUC 602	Childhood Literature	3
English Language Learners		
EDUC 676	Second Language Acquisition & Bilingualism	
or		
EDUC 740	Literacy Instruction for English Language Learners	3
<b>TOTAL CREDITS</b>		<b>15</b>

Successful completion of this Graduate Certificate Program requires five 3-credit graduate courses with a minimum grade of B- in all courses.

Students will be expected to complete this program within 4 years.

This Graduate Certificate Program can serve as an entry point into the existing MS Program in Human Development and Family Studies. Participants in the Graduate Certificate program can apply for admission into the MS program upon completion of 6-9 credits in the Graduate Certificate Program. Upon admission into the MS program, all 15 credits will count toward the MS degree. The MS in HDFS has concentrations

in Early Childhood Education, Leadership in Nonprofit Administration, and Family Support. By building upon existing coursework, the Certificate does not require new courses or resources.

**Graduate Certificate in Parent Education and Family Support**  
 Certificate in Parent Education and Family Support

The Graduate Certificate Program in Parent Education and Family Support provides professionals working parent education and agencies providing family support with skills and knowledge in the areas of family theory, development across the lifespan, parenting, working in partnership with families, risk and resilience in children and youth, family life education.

This certificate will prepare professionals involved in the fields of parent education and family support. Given the range of career opportunities and foci, options are built into the program to allow students to tailor their program to meet their career goals while meeting all learning objectives in this Graduate Certificate Program. Students will select one course from each of three categories: Family, Development and Diversity across the Lifespan, and Risk Factors. All students will take the required course in Parenting and Family Life Education. All courses in this program are based on an ecological perspective on family, family strengths, and community-based program delivery.

**COURSE REQUIREMENTS**  
**CREDITS**

- HDFS 621 Family Studies I: Empirical & Theoretical Perspectives
- or
- HDFS 647 Family Partnerships in Early Childhood Care and Education 3
- HDFS 627 Parenting Through the Lifespan 3
- HDFS 630 Family Life Education 3
- HDFS 641 Infants, Toddlers & Families: Development and Programming
- or
- HDFS 601 Theories of Human Development
- or
- HDFS 860 Diversity in Families and Human Development 3
- HDFS 646 Infant & Early Childhood Mental Health
- or

HDFS 665 Professional Development Seminar	3
<b>TOTAL CREDITS</b>	<b>15</b>

Successful completion of this Graduate Certificate Program requires five 3-credit graduate courses with a minimum grade of B- in all courses.

Students will be expected to complete this program within 4 years.

This Graduate Certificate Program can serve as an entry point into the existing MS Program in Human Development and Family Studies. Participants in the Graduate Certificate program can apply for admission into the MS program upon completion of 6-9 credits in the Graduate Certificate Program. Upon admission into the MS program, all 15 credits will count toward the MS degree. The MS in HDFS has concentrations in Early Childhood Education, Leadership in Nonprofit Administration, and Family Support. By building upon existing coursework, the Certificate does not require new courses or resources.

**Graduate Certificate in Leadership in Early Childhood and Human Services**  
 Certificate in Leadership in Early Childhood and Human Services

The Graduate Certificate Program in Leadership in Early Childhood and Human Services will prepare professionals to take leadership roles in Early Childhood and/or Human Services programs. Course options are built into the program to allow students to match their previous education, work experience and career goals while meeting all learning objectives in this Graduate Certificate Program. Students will select one course from each of four categories: Program Administration, Working with Families, Diversity across the Lifespan, and Curriculum. All students will take the required course in Staff Development. All courses in this program emphasize developmentally and culturally responsive, inclusive, and evidence-based practices in work with young children, youth, and families and the professionals who serve them.

**COURSE REQUIREMENTS**  
**CREDITS**

- HDFS 621 Family Studies I: Empirical & Theoretical Perspectives
- or
- HDFS 647 Family Partnerships in Early Childhood Care & Education 3

## College of Engineering

HDFS 656	Professional Development & Supervision	3
HDFS 637	Program Planning, Assessment & Evaluation	3
or		
HDFS 640	Early Childhood Administration, Leadership & Advocacy	
or		
HDFS 642	Leadership in Human Services	3
HDFS 641	Infants, Toddlers & Families: Development and Programming	3
or		
HDFS 601	Theories of Human Development	
or		
HDFS 860	Diversity in Families and Human Development	3
HDFS 662	Curriculum Analysis in Early Childhood	3
or		
HDFS 639	Curriculum Methods and Assessment	3
or		
HDFS 630	Family Life Education	3
<b>TOTAL CREDITS</b>		<b>15</b>

Successful completion of this Graduate Certificate Program requires five 3-credit graduate courses with a minimum grade of B- in all courses.

Students will be expected to complete this program within 4 years.

This Graduate Certificate Program can serve as an entry point into the existing MS Program in Human Development and Family Studies. Participants in the Graduate Certificate program can apply for admission into the MS program upon completion of 6-9 credits in the Graduate Certificate Program. Upon admission into the MS program, all 15 credits will count toward the MS degree. The MS in HDFS has concentrations in Early Childhood Education, Leadership in Nonprofit Administration, and Family Support. By building upon existing coursework, the Certificate does not require new courses or resources.

Certificate in Disability Leadership

### COURSE REQUIREMENTS CREDITS

HDFS 624	Introduction to Leadership and Disabilities	3
HDFS 603	Adult Disability Issues	3
HDFS 694	Financial Management in Public and Nonprofit Sectors	3

UAPP 697/HDFS 642	Leading Organizations in Public and Nonprofit Sectors	3
UAPP 690	Seminar in Public Administration	3
<b>Total</b>		<b>15</b>

Successful completion of this Graduate Certificate Program requires five 3-credit graduate courses with a minimum of B- in all courses.

Students will be expected to complete this program within 4 years.

## College of Engineering

The College of Engineering has a strong commitment to graduate education through teaching and research. Programs leading to both the Master's and Ph.D. degrees are offered through the Chemical, Civil and Environmental, Electrical and Computer, Materials Science and Engineering, and Mechanical Engineering departments. There is also a graduate program in Biomechanics and Movement Science. Many faculty are engaged in research in the bioengineering field, and there are numerous opportunities for graduate student participation.

Engineering graduate students at the University have the opportunity to participate in the College's eleven research centers: the Catalysis Center for Energy Innovation, the Center for Applied Coastal Research, the Center for Applied Science in Engineering and Rehabilitation, the Center for Biomedical Engineering Research, the Center for Catalytic Science and Technology, the Center for Composite Materials, the Center for Energy and Environmental Policy, the Center for Innovative Bridge Engineering, the Center for Molecular and Engineering Thermodynamics, the Center for the Study of Metals in the Environment, and the Delaware Center for Transportation. Detailed information on specific research programs may be obtained from the appropriate center office or the relevant engineering department, or see: <http://www.engr.udel.edu>

The College also meets the needs of practicing engineers who wish to further their education. The academic programs/Engineering Outreach Program facilitate professionally convenient graduate education by scheduling classes in the late day, evening, or distance format. Part-time non-degree graduate students can take courses through Engineering Outreach, and these courses may be applied to a traditional or non-

thesis graduate engineering degree upon regular admission to the graduate program. Detailed information about the Engineering Outreach Program may be obtained by visiting our web site or by calling (302) 831-4863.

### **Bioinformatics and Computational Biology (Certificate, PSM, MS)**

### **Biomechanics and Movement Science (MS, PhD.) (Interdisciplinary Program)**

#### **Bioengineering**

Telephone: (302) 831-2401

<http://www.engr.udel.edu/home/index.html>

Faculty Listing: <http://www.engr.udel.edu/directory/faculty.html>

#### Program Overview

In addition to the undergraduate Biomedical Engineering major, considerable research and instruction in the application of engineering to problems related to the human body have been and continue to be conducted in the Chemical, Electrical and Computer, and Mechanical Engineering Departments. Many College faculty are actively involved in the Center for Biomedical Engineering Research and the Biomechanics and Movement Science Program. These efforts are also supported by programs in the Departments of Biological Sciences, Physical Therapy and Health and Exercise Sciences. In addition, education and research projects in biomedical engineering often involve extensive interaction with local medical centers and industrial laboratories.

### **Center for Energy and Environmental Policy (MS, PhD)**

The Center for Energy and Environmental Policy (CEEP), part of the College of Engineering, conducts interdisciplinary research and supports graduate and undergraduate study on the interlocking issues of energy, environment, and development. Work in CEEP is guided by theories of political economy and technology, environment, and society. Research programs currently organized in CEEP include sustainable development, environmental justice, global environmental change, energy efficiency and renewable energy applications, water conservation and management, and comparative energy and environmental policy.

### **MASTER OF ENERGY AND ENVIRONMENTAL POLICY (MEEP)**

Telephone: (302) 831-8405

<http://ceep.udel.edu/academics/masters/meep.htm>

Faculty Listing: <http://ceep.udel.edu/people/index.html>

The 36-credit hour Master of Energy and Environmental Policy (MEEP) program can be pursued full or part time. The MEEP degree program prepares graduates to assume positions in policy analysis, planning and administration in the public, private, and non-profit sectors or continue graduate study in the environmental and energy policy field at the doctoral level.

Students may choose among 5 concentrations offered through the MEEP program: Sustainable Development, Political Economy of Energy and Environment, Disasters and Public Policy, Energy Policy, and Environmental Policy.

MEEP students complete 21 credits of required courses including two policy courses (taken in the first year), two methods courses, a six-credit social science requirement, and a three-credit science and public policy requirement. Students take an additional 15 credits of concentration or specialization electives, including the three-credit analytical paper or six-credit master's thesis.

### **ENERGY AND ENVIRONMENTAL POLICY, PhD**

Telephone: (302) 831-8405

<http://ceep.udel.edu/academics/phd/enep.htm>

Faculty Listing: <http://ceep.udel.edu/people/index.html>

The PhD degree in Energy and Environmental Policy is a research degree intended to advance interdisciplinary theory and analysis on society-environment-resource relationships and to improve the quality of research informing policy decisions in this field. Graduates of the PhD program are prepared to assume positions in academic, research and policy institutions and to provide leadership on questions of theory, analysis and research in the field. Prior completion of a master's degree in a related field is required for admission to the doctoral program.

Students may choose among 5 concentrations offered through the PhD program: Sustainable Development, Political Economy of Energy and Environment, Disasters and Public Policy, Energy Policy, and Environmental Policy. All

PhD students complete a 21-credit core course curriculum. This includes six credits of advanced theory, six credits of methodological course work, a six-credit social science requirement, and three credits in science, engineering and public policy. In addition, students in the PhD normally take 15 credit hours in their area of concentration or specialization, including the 3-credit Doctoral Research Paper, and enroll for 9 credits of doctoral dissertation. All PhD students must successfully pass a Qualifying Examination administered at the end of the first year of doctoral study.

In the first year, students complete two 3-credit seminars in advanced theory. In addition, during the first year students fulfill a social science requirement by completing two courses selected from a list of 45 graduate courses ranging from environmental ethics to electricity policy and planning. Students also complete a 3-credit science, engineering and public policy requirement. Or students may substitute a 3-credit graduate course (including a tutorial course) in a natural science- or engineering-related topic to meet the science, engineering and public policy requirement.

Qualifying Examinations in Theory, Methodology and Policy Analysis are conducted in June and also during the Winter Term. Students who have completed all first-year required courses take the next available Qualifying Examination. The examination emphasizes the interconnected nature of theory, methods and policy analysis and serves as a diagnostic of the student's preparedness to develop doctoral-level, interdisciplinary research advancing the field of energy and environmental policy.

The second year of the PhD program is devoted to course work that prepares the student to conduct doctoral-level research in their intended area of research concentration or specialization. Students are responsible, in consultation with their Guidance Committee, for selection of an area of research concentration or specialization (15 credit hours). Upon approval of the doctoral research paper, the student is admitted to doctoral candidacy and begins work on a dissertation.

### **Chemical Engineering (MCHE, PhD)**

Telephone: (302) 831-2543

<http://www.che.udel.edu>

Faculty Listing: <http://www.che.udel.edu/directory/faculty.html>

### **Program Overview**

The Department of Chemical Engineering offers graduate programs leading to the Master of Chemical Engineering (MCHE) degree and the Doctor of Philosophy (PhD) in Chemical Engineering.

The purpose of the department's graduate programs is to provide the guidance and opportunity for students to develop the quantitative skills of engineering and science, and the acumen to apply these skills for the welfare of modern society. Students in the program naturally have a broad range of interests and career objectives, and it is the philosophy of the department to expose them to a variety of fundamental and applied research problems that will hone those engineering skills necessary in any career, whether in industry, academia or government.

This involves a combination of graduate core courses in chemical engineering and applied mathematics, advanced science and engineering electives, and independent (thesis) research conducted with the guidance and mentorship of a chemical engineering faculty member. (A non-thesis option is also available for the MCHE degree).

The Chemical Engineering Department is housed in Allan P. Colburn Laboratory, a memorial to one of the pioneers in chemical engineering who established the department. The laboratory houses the Center for Catalytic Science and Technology, which is equipped with the modern tools of catalysis and surface science, and the Center for Molecular and Engineering Thermodynamics, whose personnel study a range of thermodynamic problems. Other laboratory facilities are for research in alternative energy, polymer engineering, rheology, process control, fluid mechanics, biochemical and biomedical engineering, materials science, photovoltaic systems, mass transfer, and separation processes. The department's growing emphasis on Bioengineering is enhanced by the participation of a number of faculty and students in the Delaware Biotechnology Institute. The department also benefits from close contacts with industrial colleagues in the Delaware Valley-New Jersey heartland of the chemical process industries. An extensive program of visiting scholars brings distinguished engineering scientists from around the world to the campus for periods ranging from a few days to a year.

Close contact, formal as well as informal, with

colleagues in a wide range of industries is one of the distinguishing characteristics of the department. Such contact, with corporate leaders as well as practicing engineers and scientists, helps to provide students with an understanding of the milieu in which the engineer works. Lectures given by these visitors describe the unique opportunities that engineers have to contribute to the quality of life and also the restrictions that society, acting through industry and government, places on technology.

Extensive facilities for research and graduate study are available within the department. Laboratories specifically devoted to catalysis, electrocatalysis and reaction engineering house gas chromatographs interfaced with a computer-controlled mass spectrometer, infrared spectrophotometers for surface studies of working catalysts, electron spectrometers for analysis of catalyst surfaces, x-ray diffractometers, transmission and scanning electron microscopes, a laser-Raman spectrometer, an x-ray spectrometer, gas chemisorption equipment, many catalytic flow microreactors, and hardware/software for computational studies. Many of these studies are carried out in the University's pioneering Center for Catalytic Science and Technology, supported by governmental funds and grants from a group of industrial sponsors.

Laboratories specifically devoted to polymer engineering are equipped with multiple rheogoniometers and mechanical spectrometers, Instron test equipment, x-ray diffractometers, and equipment for spinning and extruding polymers. The polymer engineering group is involved in the research of Delaware's Center for Composite Materials and in interdisciplinary activity supported by several industrial organizations of the U.S., France, Germany, Italy, Japan, and the United Kingdom.

Biochemical and biomedical engineering laboratories contain a range of equipment for cell culture and fermentation, and for protein purification, analysis, and characterization. The latter includes 2-D gel electrophoresis, high performance liquid chromatography, membrane ultrafiltration, atomic force microscopy, and capillary electrophoresis. Research in the biological area is also conducted in collaboration with colleagues in the life sciences, the Department of Chemistry and Biochemistry, the College of Agriculture and Natural Resources, the Delaware Biotechnology Institute, and laboratories in the pharmaceutical and biotechnology industries.

The process control and monitoring laboratories contain a number of real-time instrumented experiments for online model-based control and fault diagnosis. The specific experiments include emulsion polymerization, complex quadruple-tank level control and other systems. All of these units are equipped with state-of-the-art control hardware and software systems.

The J.A. Gerster Memorial Thermodynamics Laboratories contain equipment for high-pressure and low-pressure vapor-liquid equilibrium, for high-temperature and multiphase equilibrium and other physical property measurements, and for separations processes. Molecular dynamics and quantum mechanical calculations and modeling of simple and complex fluids are performed on the Facility for Computational Chemistry's parallel computer and at other computational resources at the University as well as at national centers. These and other facilities are part of the Center for Molecular and Engineering Thermodynamics.

Laboratories focused on the study of colloids and interfaces contain a variety of spectrometers for quasi-elastic light scattering, fluorescence measurements, and small-angle x-ray scattering. State-of-the-art instruments are available for the measurement of electrophoretic mobilities of colloids, surface tensions, ion activities, and conductivities, as well as for the determination of liquid phase compositions. Small angle neutron scattering investigations are also performed at national facilities.

Several faculty and students are involved in chemical engineering research in photovoltaics in which information needed for the design of large-scale processing units is obtained from laboratory-scale experimentation, in collaboration with the Institute for Energy Conversion. Experimental and theoretical studies in photovoltaic unit operations are conducted in a cooperative activity between the department and the Institute of Energy Conversion.

One of the most rapidly growing aspects of research within the department is process modeling. Research efforts include computer control and modeling of biochemical reactors, development and modeling of novel separations processes, modeling of transport in living systems, modeling and simulation of polymer processes, and elucidation and modeling of reaction pathways. To support the research in chemical engineering analysis, the department maintains its own computer laboratory. Numerous microcomputers are in use in our

research laboratories both for data acquisition and modeling; most recently several BEOWULF clusters of high performance PC computers have been built; the department also makes extensive use of the University and national computing facilities described elsewhere in this catalog.

### Requirements For Admission

The minimum requirements for admission to degree programs in the Department of Chemical Engineering are listed below:

- A baccalaureate degree in the field or in a closely allied field of science or mathematics.
- An undergraduate grade-point average in engineering, science, and mathematics courses of at least 3.0 on a 4.0 scale.
- A minimum of three letters of strong support from former teachers or supervisors.
- A minimum combined score of 1150 on the Graduate Record Examination Aptitude Test is required of all applicants to the Chemical Engineering PhD program. For the master's program, the GRE test is optional provided the applicant has a B.S. degree in chemical engineering from an ABET approved U.S. institution.
- The Test of English as a Foreign Language is required for students whose first language is not English and who have not received a degree from a college or university in which English is the sole language of instruction. (Minimum score: 600 paper based TOEFL; 250 computer based TOEFL; 1010 IBET TOEFL.)

For chemical engineering applicants the scholastic index of 3.0 in the major field is computed from the previous undergraduate work and from graduate work done in mathematics, chemistry, physics, and engineering courses. In exceptional circumstances, it may be possible to obtain provisional admission if one or more of the above criteria has not been satisfied. Admission to the graduate program in Chemical Engineering at the University of Delaware is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission. On the other hand, on rare occasions, those who fail to meet those requirements can be granted admission if they offer other exceptional strengths.

Undergraduate preparation consisting of a bachelor's program in chemical engineering leads most directly into the graduate program. However, students and practicing industrialists

with a background in chemistry will also profit from this graduate program, since chemical engineering provides for the application of their scientific skills to solutions of technological problems in industry and society. Graduates of other disciplines are also encouraged to apply; some remedial work may be required and is discussed on an individual basis.

### Financial Aid

Please refer to Graduate Fellowships and Assistantships for more information.

### Requirements for the Master's Degree

To develop the skills that recipients of master's degrees are expected to possess and use effectively, students enroll in courses that sharpen their analytic tools and provide practice in the application of these to engineering problems. Students may also select studies that develop an appreciation for society's constraints on, and opportunities for, science and technology. The MCHE program is typically elected by students wishing to carry out industrial design analysis or process and product development, and by some students who continue their studies toward the PhD. The formal requirements of 24 credit hours of course work and a 6-credit-hour thesis for the MCHE degree are substantial and are recognized as such by industrial organizations. A non-thesis MCHE degree of 30 credit hours of appropriate course work is also a degree option in the department.

### Requirements For The PhD Degree

Students may elect to study directly toward a PhD upon enrollment or may obtain the MCHE degree first. Admission to the PhD program in chemical engineering formally requires passing an oral qualifying examination prepared by the department as well as achieving a minimum 3.0 GPA in a set of required graduate courses. The oral examination includes presentation of a research proposition by the candidate to demonstrate the ability to devise and develop a research idea. Current requirements also include a minimum of 3 elective CHEG 600 and 800 level courses (a total of 8 credits) with at least 3 credits at the advanced (800) level. Students may also substitute courses offered by other departments upon approval.

## **Civil and Environmental Engineering (MAS, MCE, PhD)**

Telephone: (302) 831-2442

<http://www.ce.udel.edu>

Faculty Listing: <http://www.ce.udel.edu/directories/faculty.html>

### Program Overview

The Department of Civil and Environmental Engineering offers graduate programs of study and research leading to three degrees: Master of Civil Engineering, Master of Applied Sciences, and Doctor of Philosophy in Civil Engineering. The Master of Civil Engineering degree emphasizes Civil Engineering, while the Master of Applied Sciences degree is for students not having engineering as first degrees. The PhD is aimed at training the graduate student in research within a chosen topic. All three degrees are based on the student completing an individually designed program of courses and writing a thesis. A non-thesis Master's degree option is available, typically for students with professional experience. Students selecting the non-thesis option are not eligible for financial support from the University. Areas of concentration are:

- Environmental Engineering
- Structural Engineering
- Geotechnical Engineering
- Transportation Engineering
- Coastal Engineering
- Water Resource Engineering
- Civil Infrastructure Systems

In cooperation with the College of Earth, Ocean, and Environment, the department also offers multidisciplinary degrees for the Master of Science and Doctor of Philosophy in Ocean Engineering.

In each area, mathematics, fundamental sciences and engineering sciences are combined to provide a personalized program of study and research.

All graduate students work in close cooperation with the faculty, and the department has extensive facilities for research and graduate study in all the areas of concentration. Laboratories specifically devoted to research in environmental engineering include facilities for study of chemical and physical aspects of water and wastewater purification with specialized equipment for analysis of fluid particle suspensions and particle technology, heavy metal and toxic waste removal and biological

engineering aspects of water pollution control.

The ocean engineering laboratory is one of the largest and best equipped in the country. A unique wavemaker capable of generating realistic three-dimensional seas has been installed in one of the wave basins. Narrow and wide wave tanks are also available including a high precision 108 ft. long wave flume. Equipment available for field research includes tide gages, current meters, fathometers, surveying equipment, remote-sensing apparatus, and small research vessels.

The structures laboratories include an excellent range of equipment for static, dynamic, and fatigue testing, and a modern concrete testing facility. The geotechnical laboratory has state-of-the-art equipment for testing soils and geotextiles.

The department's research is extensively funded through many contracts from federal agencies, the state, and private engineering sponsors. The department houses the Center for Applied Coastal Research, the Center for Innovative Bridge Engineering, the Center for the Study of Metals in the Environment, and the Delaware Center for Transportation.

### Requirements For Admission

Candidates for admission are invited to correspond with the department chair and/or members of the faculty. A personal visit to the department is recommended wherever possible. Students who are interested in admission may request current department information on curriculum, core courses, and degree programs.

Courses are offered annually or in alternate years, but always as organized programs orchestrated to ensure that the necessary courses are always available to our students.

Applicants are expected to have:

- A baccalaureate degree in the field or in a closely allied field of science or mathematics,
- An undergraduate grade-point average in engineering, science, and mathematics courses of 3.0 on a 4.0 scale,
- A minimum of three letters of strong support from former teachers or supervisors,
- A minimum combined score of 1050 on the Graduate Record Examination Aptitude Test,
- The Test of English as a Foreign Language (TOEFL) is required for students whose first language is not English and who have not

received a degree from a college or university in which English is the sole language of instruction. (Minimum score: 550 paper based TOEFL; 213 computer based TOEFL; 79 IBET TOEFL.)

Admission to the graduate program in Civil Engineering at the University of Delaware is selective and competitive based on the number of well qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission.

#### Financial Aid

Please refer to Graduate Fellowships and Assistantships for more information.

#### Requirements For The Master's Degrees

The master's degree requires that the student obtains skills in a range of modern analytical and computational tools and in their application to engineering problems. Formally, the student must perform 24 credit hours of course work and 6 credit hours of thesis. For students with professional experience, a non-thesis option is available. The MCE program is often chosen by students planning to pursue a career as professional engineers. The program, however, is also well suited as an introduction to a PhD in Civil Engineering or other engineering or science-oriented areas.

The specific requirements for the different degrees are available upon request to the department.

#### Requirements For The PhD Degree

Although it is possible for students to study toward a PhD directly upon entering graduate school, most students choose to obtain the MCE or MAS first.

A student's doctoral program, including the doctoral thesis, is centered on a research objective in applied or engineering science. The degree requires sufficient course work within, or in direct support of, the chosen area of concentration to form an adequate basis for original work. In addition, the student's knowledge must be extended within other fundamental sub-areas such as applied mathematics, physical, chemical, biological and engineering sciences. In the thesis the student reports the findings of his or her independent research. Further information about details may be obtained from the current Departmental

Graduate Program brochures.

The PhD is particularly useful for students who plan to pursue a career in research and teaching at the university level but also provides a superlative education for a career as a professional engineer.

### **Computer and Information Sciences (MS, MSSE, PhD)**

Telephone: (302) 831-2712

<http://www.cis.udel.edu>

Faculty Listing: [http://www.cis.udel.edu/people/all\\_faculty](http://www.cis.udel.edu/people/all_faculty)

#### Program Overview

The Department of Computer and Information Sciences offers programs leading to the PhD and MS degrees. Computer Science is a vigorous and exciting field of research and study that continues to grow in importance. Computer science programs are broad in scope and deal with software and hardware technology, the theory of computation, scientific computing, and their applications. Departmental research strengths include artificial intelligence (machine learning, multiagent systems, planning and problem solving), bioinformatics, computational theory (computational learning theory, design and analysis of algorithms, computability theory), compiler optimization and compilation for parallel machines, natural-language processing, (discourse and dialogue, generation, information extraction, summarization), systems (parallel and distributed computing, grid and volunteer computing, algorithm and architecture design for massive parallelism), networks, (distributed computing, transport layer protocols, mobile and wireless networks, algorithm and architecture design for massive parallelism, networks management, security performance modeling, simulation), graphics and computer vision, rehabilitation engineering (augmentative communication, speech recognition and enhancement), software engineering (program analysis and testing), and symbolic mathematical computation (algebraic algorithms, parallelization), and robotics.

The CIS graduate program provides a solid foundation in the fundamental areas of computer science and, in addition, provides numerous advanced courses and seminars to acquaint the student with current computer science research. The main difference in objectives between the MS and PhD programs is that the PhD is designed to prepare students to conduct

advanced research.

## Requirements For Admission

Graduate admission requirements originate at two levels: the University and the CIS Department. The University-level requirements may be found in the Graduate Admissions section.

Applicants must also satisfy the following general departmental requirements for admission to the CIS graduate program:

- The equivalent of a bachelor's degree at the University of Delaware. A minimum grade average of 3.2 in the major field of study and an overall cumulative index of 3.0 is required.
- Scholarly competence in mathematics and computer programming. Applicants are expected to know the material covered by at least one undergraduate course in each of the following topics:
  - structured high-level language programming,
  - data structures,
  - computer architecture,
  - operating systems,
  - analysis of algorithms.

Additionally, applicants must have completed the equivalent of at least four undergraduate courses in the following list:

- calculus,
- discrete mathematics,
- probability and statistics,
- mathematical logic,
- comparable formal subjects, such as Theory of Computation.

- Strong applicants lacking prerequisites are occasionally admitted provisionally on the condition that they complete specified undergraduate courses with a B or better in addition to the normal degree requirements. Students without formal course work covering the prerequisites who have gained equivalent knowledge through work or other experience should submit appropriate evidence.
- Minimum scores of 550, 650 and 4.0 on the verbal, quantitative, and analytical writing sections, respectively, of the Graduate Record Examination Aptitude Test. The GRE subject test is not required.
- If the applicant has completed graduate courses in computer science beyond the bachelor's degree, the grades earned in these courses will be reviewed and considered in the admission decision. A minimum grade of 3.0 (B) in each of these courses is required.

- For applicants whose first language is not English, and who have not received a degree at a U.S. college or university, a TOEFL score of 79 or better on the Internet test, or 213 or better on the computer test, or 550 or better on the old paper test, is required by the University for admission without financial aid. For applicants who seek a teaching assistantship appointment, a TOEFL score of 100 or better on the Internet test, or 250 or better on the computer test, or 600 or better on the old paper test is required. In addition, for applicants who have not graduated from an institution whose principal language of instruction is English, the Test of Spoken English is highly recommended.
- Three letters of recommendation from professors (preferably), employers, or others who are able to assess your potential for success in graduate studies. Use the University of Delaware recommendation form whenever possible. Any attached letter should be a signed original and, preferably, on colored letterhead from the author's institution.
- It is suggested, but not required, that students provide official documentation of their relative ranking within their class.
- A Master's degree is not required for admission to the PhD program. Strong applicants with a Bachelor's degree are encouraged to apply directly for admission to the PhD program.

Note: Admission to the graduate program is competitive. Those who meet stated minimum requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

## Financial Aid

A number of fellowships, research assistantships and teaching assistantships are awarded each year to full-time graduate students in the Department. Additionally, a few fellowships are awarded by the University to particularly outstanding students. Both entering and continuing graduate students are eligible to apply for financial aid.

If awarded financial aid and if satisfactory academic progress is maintained along with satisfactory performance of assistantship duties (when applicable), students entering with a bachelor's degree are normally supported up to two years for the MS degree, or up to five years for the PhD degree. Students entering with a master's degree are normally supported up to three years.

To maintain satisfactory academic progress beyond the second year, those students entering with a bachelor's degree are expected to take and pass the PhD Preliminary Examination after no more than three semesters of study. Students entering with an MS degree in Computer and Information Sciences (or a related area) are expected to take and pass the PhD Preliminary Examination after one semester of study.

Students who receive financial aid midway in their studies should speak to the CIS Graduate Committee Chair regarding their expected length of support. With regard to financial aid, PhD students are those who have passed the Preliminary Exam.

Admission to the graduate program does not automatically entitle an applicant to financial aid. Aid is awarded on a competitive basis from the pool of admitted applicants. Usually awards are made in March-May for the fall semester, and in December for the spring semester.

#### Requirements For MS Degree

In addition to satisfying the general requirements of the University, candidates for the Master of Science degree must satisfy both the departmental general requirements and the computer science course requirements.

An Application for Advanced Degree for the Master of Science degree should be filed with the Departmental Graduate Committee no later than the beginning of the semester in which the degree is expected. Application forms are available from the Office of Graduate and Professional Education.

#### A. Departmental General Requirements

The Departmental General Requirements include:

1. At least 9 credits of the 30 credits used to satisfy the degree requirements must be 800-level CISC courses. Credits for independent study, research and master's thesis do not count towards this requirement.
2. A minimum grade average of 3.0 is required in the graduate courses used to satisfy the degree requirements. The University also requires a minimum GPA of 3.0 in all graduate courses taken including any not used towards the required 30 credits. Students are encouraged to explore graduate courses (600 level or higher) in other areas such as electrical engineering,

mathematics, linguistics, statistics, and business and economics. Graduate courses outside of Computer and Information Sciences to be used towards meeting degree requirements require written approval of the Graduate Committee.

3. Students are encouraged to participate in the research activities of the Department by taking CISC 666, CISC 866-Special Problems and Independent Study or CISC 868-Research. This is especially true of potential PhD students. No more than three credits of CISC 666, CISC 866 or CISC 868 (combined) may be applied toward meeting the degree requirements or used in satisfying the required minimum grade average without prior written approval from the Graduate Committee. (Exception for master's thesis students-see later section.)

4. Each semester all graduate students must explicitly register for CISC 890 - Colloquium and sign up and satisfactorily participate in one of the Department's special research interest groups. One faculty member for each group will be responsible for overseeing satisfactory participation for each student on an individual basis (e.g., simply attending, giving a presentation) and will assign a pass/fail grade accordingly. Each MS student needs 3 semesters of passed CISC 890 to graduate. Special arrangements for part-time students and those who finish in less than 3 semesters will be made.

#### B. Computer Science Course Requirements

Breadth requirement courses:

Systems

-Computer Architecture (CISC 662)

-Operating Systems (CISC 663)

-Computer Networks (CISC 650)

Software

-Computer Graphics (CISC 640)

-Advanced Compiler Construction (CISC 672)

-Artificial Intelligence (CISC 681)

Theory

-Theory of Computation (CISC 601)

-Logic (CISC 604)

-Analysis of Algorithms (CISC 621)

1. All students must take a graduate course in either algorithm design and analysis (e.g., CISC 621) or in theory of computation (e.g., CISC 601).
2. All students must take four breadth courses, including at least one in each of the three areas.
3. A grade of B- or better is required in each of the four breadth courses taken to meet the breadth requirement.

4. Substitutions or satisfaction through courses taken at another university are permitted, but require written approval by the Graduate Committee.

### C. Master's Thesis

A master's thesis is optional; successful completion requires a combination of six credits of CISC 868 and/or CISC 869, which are included in the thirty credits needed for the MS degree. Students with a high GPA and/or motivation and ability to perform research are strongly encouraged to get involved in a research project. One way to do this is to complete an MS thesis.

Each student working on a master thesis, with the advice of the master's thesis advisor, needs to establish an advisory committee. The committee consists of 2-3 members of the faculty approved by the CIS Graduate Program Committee. The committee chair is a faculty member in the CIS department, and the thesis advisor. At least one other member should be a faculty member in the CIS department. The proposed advisory committee must be submitted to the Graduate Program Committee for approval. Upon completion of the master's thesis, a final oral examination must be passed, consisting of a defense of the master's thesis. The final oral examination is directed and evaluated by the student's advisory committee.

Admission to the master's degree program does not guarantee that a student can pursue a thesis since more students may desire to do a thesis than there are faculty available to guide them. A thesis student may obtain three credits of CISC 666, CISC 866, CISC 868 in addition to the six credits of CISC 868 and/or CISC 869 applied toward the MS thesis only if the areas of study do not overlap, as approved by the CIS Graduate Committee. The MS thesis student must still satisfy all other Department requirements.

Requirements for MS in Software Engineering Degree  
Master of Science: Software Engineering (MSSE)

This program is intended to prepare students for a professional career as a practicing software engineer. Graduates of this program can expect to have expanded career options and responsibilities involving any or all aspects of software engineering.

### Admissions Requirements

Criteria: General requirements for admission:

A bachelor's degree at a recognized four-year college or university with a minimum grade average of 3.0 is required.

All applicants are expected to have scholarly competence in mathematics and computer programming. Applicants without a degree in computer science or computer engineering or a related area, are expected to know the material and have the skills covered by at least one undergraduate course in each of the following topics:

- structured high-level language programming
- data structures
- analysis of algorithms
- discrete mathematics

The following minimum scores are expected on the GRE (Graduate Record Examination) test:

Quantitative: 650

Verbal + Quantitative: 1150

Analytical Writing: 4.0

No GRE subject test is required.

For applicants whose first language is not English, and who have not received a degree at a U.S. college or university, a TOEFL score of 100 or better on the Internet test, or 250 or better on the computer test, or 600 or better on the old paper test is required. In addition, for applicants who have not graduated from an institution whose principal language of instruction is English, the Test of Spoken English is required.

Three letters of recommendation are required from professors, employers, or others who have had a supervisory relationship with the applicant and are able to assess the applicant's potential for success in graduate studies.

The applicant will apply to the MSSE program with the understanding (as reinforced during the application process) that this is an "interdisciplinary graduate program" overseen by the Joint Graduate Committee on Software Engineering (JGCSE). The student will remain in the "interdisciplinary graduate program" matriculation until later in the program, when the practicum project is defined and a faculty advisor is designated for the practicum. At that time, the student's matriculation will be changed to match the college of that practicum faculty advisor.

### Transfer Policy

Up to 9 relevant UD graduate credits can be taken as a CEND or Graduate/Non-degree student prior to application/admission to the degree program. In addition, a maximum of 9 credits can be transferred from other institutions with the approval of the Joint Graduate Committee on Software Engineering.

Credit Requirements: The Master of Science

- Software Engineering program requires 30 credit hours of course work. The 30-credit course program of each student must include:

- Fifteen (15) credits of core requirement courses.
- Twelve (12) credits of a specialization track courses.
- Three (3) credits of practicum.

The core courses may be taken in any order. However, all core courses must be completed before the student begins the practicum. The specialization courses may be taken at any time and in any order, as long as all course pre- and co-requisites are respected.

The core courses are:

CISC 611/CPEG 611 Software Process Management	3 cr
CISC 612/CPEG 612 Software Design	3 cr
CISC 613/CPEG 613 Software Requirements Engineering	3 cr
CISC 614/CPEG 614 Software Verification	3 cr
CISC 615/CPEG 615 Software Testing and Maintenance	3 cr

The specialization track is determined by the student's interests and must be approved by the student's advisor. The selected courses should form a coherent whole, giving the student a degree of expertise in a single area. Examples of specialization tracks may be found on the program website.

The practicum (CISC 691/CPEG 691) will be guided by the individual student's interests. It must be arranged with, and approved by, a CIS or ECE faculty member. The student will contribute to a significant software engineering project either on campus or in association with an off-campus organization such as a private business or government agency.  
Requirements For The PhD Degree

In addition to satisfying the general requirements of the University, candidates for the Doctor of Philosophy degree must satisfy several departmental requirements. One objective of these requirements is to provide flexibility in designing an appropriate plan of study. The PhD is an individualistic degree. As soon as possible in the program, each candidate should find a faculty member to act as advisor and be in charge of the candidate's research.

The candidate and advisor design a plan of study that satisfies the University and Department

requirements. The Department requirements as listed below specify a minimum amount of necessary work. It is expected that additional course work will normally be required by the adviser. A minimum set of requirements provides a large degree of flexibility for each individual candidate.

#### A. Departmental General Requirements

The Departmental requires the following:

1. Course Work. Each candidate must complete all requirements of a University of Delaware MS degree in Computer and Information Sciences. Candidates with a similar degree from another institution of higher education may be exempted from part or all of this requirement with the written approval of the Graduate Committee.

A candidate with a master's degree in a related field (e.g., EE, Math) must put together a program that meets the CIS Graduate Committee's approval. Using courses taken for the related graduate degree plus courses taken at Delaware, the candidate must satisfy the Computer Science course requirements for the MS degree, and show the equivalent of the 30 credit MS degree offered by the CIS Department.

Each candidate is required to complete a minimum of 6 additional credits beyond the master's degree. The 6 additional credits do not include the following courses: CISC 666, CISC 866, CISC 868, CISC 969. Normally, in meeting the University's requirement for a major area, a candidate will be required by the adviser to complete more than 6 credits. (Note that the University requires a candidate to complete 9 credits of CISC969 after admission to candidacy.)

2. Research Ability. PhD candidates are strongly encouraged to get involved in research as early as possible in their program. As part of the process of finding an adviser, and as early as possible, candidates must demonstrate the potential to perform research. Demonstration may be in the form of independent study (CISC 666, CISC 866), research (CISC 868), working as a research assistant, or writing an MS thesis.

3. Preliminary Examination. Each candidate must pass a preliminary examination that tests a person's breadth of knowledge of computer science. This exam, normally offered annually in January, is based on subject matter usually included in a CIS undergraduate major and in one year of full-time graduate study including

the core areas of the MS program. The detailed composition of the preliminary exam, within the constraint of testing breadth of CIS knowledge, is based upon a reading list of textbooks determined by the Graduate Committee with faculty approval. Candidates are encouraged to take the preliminary exam as early as possible. Students entering with a Bachelor's degree should normally take the preliminary exam by the end of their third semester; and those with a Master's degree should normally take it by the end of their first semester. The preliminary exam may be taken at most two times.

4. Advisory Committee. Each candidate, with the advice of the PhD advisor, needs to establish an advisory committee (usually following the successful completion of the preliminary exam). In accordance with the University requirements, the committee consists of 4-6 members of the faculty nominated and approved by the CIS Department faculty. The committee chair is the faculty member in charge of the candidate's research and dissertation. At least two members represent the area of proposed research. At least one member must be from outside the CIS Department. The proposed advisory committee must be submitted to the Graduate Committee for approval. It must then be approved by the CIS faculty.

5. Qualifying Examination. Each candidate must pass a qualifying exam. The advisory committee prepares an examination (oral and/or written) testing a candidate's knowledge in the area of proposed research. Part of the examination includes an oral presentation of a candidate's proposed dissertation research. A student passes the qualifying exam as long as there is no more than one negative vote.

Prior to taking the qualifying exam, candidates must submit a dissertation proposal and a written plan describing their background and research interests. The proposal and plan are submitted to the advisory committee and are considered as input to the qualifying examination. Copies of "Discussion on PhD Thesis Proposals in Computing Science" are available in the CIS Department Office.

The qualifying exam is normally taken one year after passing the preliminary exam. During this year a student should actively investigate research possibilities and select a dissertation topic.

6. Dissertation. Each candidate must complete a dissertation demonstrating results of original

and significant research written in a scholarly and competent manner worthy of publication. Upon completion of the dissertation, a final oral public examination must be passed, consisting of a defense of the dissertation and a test of the mastery of a candidate's research area. The final oral examination is directed and evaluated by the student's advisory committee.

7. Facility of Expression in English. As part of satisfying the University's requirement that PhD graduates demonstrate an ability to orally express themselves clearly and forcefully, each candidate must present his or her research results in a departmental colloquium, or one of the Department's special research interest groups within six months of the defense.

8. Foreign Language. There is no foreign language requirement.

## **Electrical and Computer Engineering (MS, MSSE, PhD)**

Telephone: (302) 831-2406

<http://www.ece.udel.edu>

Faculty Listing: <http://www.ece.udel.edu/people/faculty.php>

### Program Overview

The Electrical and Computer Engineering Department offers programs leading to the degrees of Master of Science in Electrical and Computer Engineering and Doctor of Philosophy in Electrical and Computer Engineering. In conjunction with the Computer and Information Sciences department, the Electrical and Computer Engineering department offers a Master of Science in Software Engineering degree.

Active areas of research in electrical and computer engineering include bioengineering, clean energy, communications, signal processing and controls, computer and sensor networks, computer systems, electromagnetics and photonics, and materials devices nanoelectronics.

The Department of Electrical and Computer Engineering is housed in Evans Hall and DuPont Hall. The Department maintains excellent facilities for teaching and research, including supercomputing and distributed computing systems, and class 10 and class 1000 clean rooms equipped for epitaxial crystal growth, semiconductor device fabrication, and nanofabrication. Additional laboratories are

well-equipped for electronic, microwave, and optical measurements, signal and image capture and processing, antenna, electromagnetics, and communications studies, and biomedical signal capture and investigations. Complementing these facilities are Government funded major Research Centers supporting the focus areas, including the Solar Power Center, Nanotechnology Center, and the Delaware Biotechnology Institute.

General computing facilities include state-of-the-art servers from Sun Microsystems, with a variety of workstations from Sun, SGI, HP, IBM and others. The Department maintains a state-of-the-art Intranet connecting all rooms, labs, and offices, as well as connecting the Department with the rest of campus and the Internet. Several computing laboratories are available with workstations, PCs, and a variety of software to support teaching and research with 24x7 access. Many labs contain specialized computing and networking equipment to aid research in specific areas.

Graduate students are expected to actively participate in research, including the development of presentations and publications detailing their research contributions.

#### Requirements for Admission - Masters and/ or Doctoral Degree in Electrical and Computer Engineering

The requirements for admission to the master's and/or doctoral program in electrical and computer engineering are:

- Applicants normally will have a B.S. in electrical or computer engineering. However, admission may be granted to applicants with an undergraduate degree in another engineering or related field, such as math, physics, or computer science.
- All applicants are required to submit Graduate Record Examination (GRE) scores. The Department requires a combined score of the verbal and quantitative sections in excess of 1050, with a quantitative score in excess of 600.
- The Test of English as a Foreign Language (TOEFL) is required for students whose first language is not English and who have not received a degree from a college or university in which English is the sole language of instruction. The ECE department requires the following minimum scores:
- TOEFL Paper-based test (PBT) the minimum requirement is 550 for admissions and 600 to be considered for a teaching assistantship.

- TOEFL Internet-based test (IBT) the minimum requirement is 79 for admissions and 100 to be considered for a teaching assistantship.
- An alternative to the TOEFL test is IELTS (International English Language Testing System). The minimum requirement is 6.5 for admissions and 7.5 for a teaching assistantship.
- Applicants are expected to have an undergraduate grade-point average (GPA) in engineering, science, and mathematics courses of 3.0 on a 4.0 scale. International students who have questions calculating their GPA should contact the Graduate Admissions Office for a chart.

Admission is selective and meeting the minimum requirements of the Department does not guarantee admission. The number and quality of other applicants as well as the availability of faculty supervision and laboratory space affect the number of students offered admission. The Department may find it appropriate to consider admitting an applicant who does not meet all of the admission requirements as stated if it is clear that other strengths identified in the applicant's admission information outweigh the stated minimum requirements for admission.

#### REQUIREMENTS FOR THE DEGREES

##### Master's Degree - Thesis Program

The thesis master's degree program is designed for individuals who want to broaden their electrical and computer engineering foundation knowledge while also conducting an in-depth research project. All master's degree students receiving financial aid, at any point in their program, must take the thesis option.

**Credit Requirements:** The master's program requires 30 credit hours including at least 24 graduate course credits and at least 6 credits for master's thesis (ELEG 869).

The 24-credit course program of each student must include:

- Six (6) credits of electrical and computer engineering Foundation courses.
- Eighteen (18) credits of advanced technical courses (level 600 or above) related to the student's area of interest. At most twelve (12) credits of these can bear non-ELEG/CPEG numbers and at least three (3) credits must be of 800 level electrical and computer engineering courses.

**Thesis Requirement:** All students in the thesis master's degree program will carry out original publishable research in collaboration with their advisor and, possibly, other collaborators. Masters's candidates must write a thesis describing their contributions to this research. Theses must follow the University's rules and those accepted in the profession for the presentation of original work. Master's theses will have two faculty readers, the advisor and one additional reader approved by the faculty advisor and Graduate Committee. The Department Chair, upon recommendation of the readers, approves theses.

### Master's Degree - Non-Thesis Program

This program is intended to satisfy the continuing education needs of working engineers and recent graduates who want to broaden their electrical and computer engineering foundation before starting an industrial career. Financial aid is not available to students taking this program. Students receiving financial aid, at any point in their program, must enroll in the thesis master's degree program.

**Credit Requirements:** The non-thesis master's program requires 30 credit hours of course work.

The 30-credit course program of each student must include:

Six (6) credits of electrical and computer engineering foundation courses.

Twenty-four (24) credits of advanced technical courses (level 600 or above) related to the student's area of interest. At least six (6) credits of these must be 800 level electrical and computer engineering courses and at most twelve (12) credits can bear non-ELEG/CPEG numbers.

### Master of Science: Software Engineering (MSSE)

This program is intended to prepare students for a professional career as a practicing software engineer. Graduates of this program can expect to have expanded career options and responsibilities involving any or all aspects of software engineering.

### Admissions Requirements

**Criteria:** General requirements for admission:

- A bachelor's degree at a recognized four-year college or university with a minimum grade average of 3.0 is required.

- All applicants are expected to have scholarly competence in mathematics and computer programming. Applicants without a degree in computer science or computer engineering or a related area, are expected to know the material and have the skills covered by at least one undergraduate course in each of the following topics:

- structured high-level language programming
- data structures
- analysis of algorithms
- discrete mathematics

The following minimum scores are expected on the GRE (Graduate Record Examination) test:

Quantitative: 650

Verbal + Quantitative: 1150

Analytical Writing: 4.0

No GRE subject test is required.

- For applicants whose first language is not English, and who have not received a degree at a U.S. college or university, a TOEFL score of 100 or better on the Internet test, or 250 or better on the computer test, or 600 or better on the old paper test is required. In addition, for applicants who have not graduated from an institution whose principal language of instruction is English, the Test of Spoken English is required.
- Three letters of recommendation are required from professors, employers, or others who have had a supervisory relationship with the applicant and are able to assess the applicant's potential for success in graduate studies.
- The applicant will apply to the MSSE program with the understanding (as reinforced during the application process) that this is an "interdisciplinary graduate program" overseen by the Joint Graduate Committee on Software Engineering (JGCSE). The student will remain in the "interdisciplinary graduate program" matriculation until later in the program, when the practicum project is defined and a faculty advisor is designated for the practicum. At that time, the student's matriculation will be changed to match the college of that practicum faculty advisor.

### Transfer Policy

Up to 9 relevant UD graduate credits can be taken as a CEND or Graduate/Non-degree student prior to application/admission to the degree program. In addition, a maximum of 9 credits can be transferred from other institutions with the approval of the Joint Graduate Committee on Software Engineering.

**Credit Requirements:** The Master of Science - Software Engineering program requires 30

credit hours of course work. The 30-credit course program of each student must include:

- Fifteen (15) credits of core requirement courses.
- Twelve (12) credits of a specialization track courses.
- Three (3) credits of practicum.

The core courses may be taken in any order. However, all core courses must be completed before the student begins the practicum. The specialization courses may be taken at any time and in any order, as long as all course pre- and co-requisites are respected.

The core courses are:

CISC 611/CPEG 611 Software Process Management	3 cr
CISC 612/CPEG 612 Software Design	3 cr
CISC 613/CPEG 613 Software Requirements Engineering	3 cr
CISC 614/CPEG 614 Software Verification	3 cr
CISC 615/CPEG 615 Software Testing and Maintenance	3 cr

The specialization track is determined by the student's interests and must be approved by the student's advisor. The selected courses should form a coherent whole, giving the student a degree of expertise in a single area. Examples of specialization tracks may be found on the program website.

The practicum (CISC 691/CPEG 691) will be guided by the individual student's interests. It must be arranged with, and approved by, a CIS or ECE faculty member. The student will contribute to a significant software engineering project either on campus or in association with an off-campus organization such as a private business or government agency.

## PhD Degree

The PhD degree program is designed for individuals interested in fundamental research on novel aspects of electrical and computer engineering. The degree is intended for individuals planning to pursue academic research and/or industrial research and development careers. All students pursuing the PhD degree are initially entered in pre-candidacy. Formal entry into the PhD program, or candidacy, is granted following the successful completion of the PhD Qualifying Examination and approval of the student's Research and

Study Program.

The PhD is a research degree. Each PhD candidate must carry out a program of substantial original publishable research on a topic agreed upon by his/her committee and prepare a written dissertation. Candidates must also satisfy the following general requirements: Candidates are required to complete one continuous academic year of full-time study as a residency requirement.

Candidates must complete the course requirements for the thesis master's degree, or have been awarded a master's degree in electrical or computer engineering or closely related field.

Candidates must take at least two foundation courses outside their area of concentration. Candidates must take at least 9 credits of Doctoral Dissertation (ELEG 969). Concentrations

Students in all Electrical and Computer Engineering graduate degree programs may elect to choose a concentration area of study. Concentrations are available in Computer Systems & Networking, Software Engineering, Signal Processing, Communications and Controls, Materials and Devices, Electromagnetics and Photonics, and Biomedical Engineering. Students selecting a concentration must meet the concentration requirements detailed below, in addition to meeting their general degree requirements. Concentrations are voluntary, and students selecting multidisciplinary or other specialized studies need not declare a concentration.

## CONCENTRATION IN COMPUTER SYSTEMS AND NETWORKING

Students in the Computer Systems & Networking (CSN) concentration focus on research and coursework in computer architecture and parallel systems, optimizing and parallelizing compilers, design and test of high-performance digital and analog VLSI circuits, wired and mobile wireless networking, computer program optimization, as well as emerging CSN theories and applications.

Required Courses:

ELEG 651	Computer Networks	3
ELEG 652	Principles of Parallel Computer Architecture	3
ELEG 662	Digital System Seminar (each semester)	0

A minimum of two courses from the following:

CPEG 621	Compiler Design	3
CPEG 622	Computer Systems Design II	3

CPEG 660	Introduction to VLSI Systems	3
ELEG 653	Computer System Security	3
CPEG/ELEG 654	Sensor and Data Wireless Networks	3
ELEG 655	High-performance Computing with Commodity Hardware	3
CPEG/ELEG 819	Topics in Networking I	3
CPEG/ELEG 820	Topics in Networking II	3

#### CONCENTRATION IN SOFTWARE ENGINEERING

Students in the Software Engineering (SE) concentration focus on research and coursework involving the intricate challenges of large-scale software development, spanning the entire software development lifecycle including requirements formulation and modeling, software design, software projects and planning, program verification and testing, as well as the underlying technology and tools such as compilers and information retrieval. Students in the SE concentration must complete the following:

##### Required Courses:

CPEG 612	Software Design	3
CPEG613	Requirements Engineering	3
ELEG662	Digital System Seminar (each semester)	0

A minimum of two courses from the following:

CPEG611	Software Process Management	3
CPEG614	Software Verification	3
CPEG615	Software Testing and Maintenance	3
CPEG621	Compiler Design	3
CPEG657	Search Engine Technology	3

#### CONCENTRATION IN SIGNAL PROCESSING, COMMUNICATIONS, AND CONTROLS

Students in the Signal Processing, Communications, and Controls (SPCC) concentration focus on research and coursework in multimedia signal processing, statistical and nonlinear signal processing, image processing, time-frequency analysis, wireless communications, information theory, coding, as well as emerging SPCC theories and applications. Students in the SPCC concentration must complete the following:

A minimum of two courses from the following:

ELEG 630	Information Theory	3
ELEG 631	Digital Signal Processing	3
ELEG 635	Digital Communications	3
ELEG 636	Statistical Signal Processing	3

A minimum of two courses from the following:

ELEG 633	Image Processing	3
ELEG 654	Sensor and Data Wireless Networks	3
ELEG 675	Image Processing with Biomedical Applications	3
ELEG 677	Biosignal Processing	3
ELEG 811	Channel Coding Theory and Practice	3
ELEG 812	Wireless Digital Communications	3
ELEG 832	Wavelets and Filter Banks	3
ELEG 833	Nonlinear Signal Processing	3

Required courses:

ELEG 663	Signal Processing and Communications Seminar (each semester)	0
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#### CONCENTRATION IN MATERIALS AND DEVICES

Students in the Materials and Devices (MD) concentration focus on research and coursework in solid-state physics, semiconductor growth, device fabrication, and electromagnetic measurement and characterization.

Required courses:

ELEG 622	Electronic Materials Processing	3
ELEG 646	Nanoelectronic Device Principles	3
ELEG 661	Materials and Devices Seminar (each semester)	0

A minimum of two courses from the following:

ELEG 627	THz and MMW Light Generation and Detection	3
ELEG 640	Opto-Electronics	3
ELEG 648	Advanced Engineering Electromagnetics	3
ELEG 647	Optical Properties of Solids	3
ELEG 650	Semiconductor Device Design and Fabrication	3

#### CONCENTRATION IN ELECTROMAGNETICS AND PHOTONICS

Students in the Electromagnetics and Photonics (EP) concentration focus on research and coursework in optics and electromagnetics, optoelectronic, microwave, millimeter-wave and terahertz devices and systems, device

fabrication, and electro-magnetic measurement and characterization.

Required courses:

ELEG 648	Advanced Engineering Electromagnetics	3
ELEG 682	Optics and Photonics	3
ELEG 661	Materials and Devices Seminar (each semester)	0

A minimum of two courses from the following:

ELEG 622	Electronic Materials Processing	3
ELEG 627	THz and MMW Light Generation and Detection	3
ELEG 638	Theory and Design of Diffractive Optics	3
ELEG 640	Opto-Electronics	3
ELEG 641	Antenna Theory and Design	3
ELEG 646	Nanoelectronic Device Principles	3
ELEG 842	RF and Microwave Technology	3
ELEG 853	Integrated Optics	3
ELEG 855	Microwave and Millimeter-wave Technology	3

#### CONCENTRATION IN BIOMEDICAL ENGINEERING

Students in the Biomedical Engineering (BME) concentration focus on research and coursework in biomedical applications of signal and image processing, imaging systems, biophotonics, biochemical detection, cardiovascular and respiratory control, electrophysiology, computational biology, and bioinformatics. The BME concentration is available to students in the MSECE and PhD degree programs.

Required courses:

ELEG 664	Biomedical Engineering Seminar (each semester)	0
ELEG 671	Mathematical Physiology	3
ELEG 679	Introduction to Medical Imaging Systems	3

A minimum of two courses from the following:

ELEG 675	Image Processing with Biomedical Applications	3
ELEG 678	Introduction to Nano and Biophotonics	3
ELEG 680	Immunology for Engineers	3
ELEG 801	Advanced Topics in Biomedical Engineering	3

#### Energy and Environmental Policy (MEEP, PhD)

John Byrne, PhD, Distinguished Professor of Energy and Climate Policy and Director  
Young-Doo Wang, PhD, Director of Energy and Environmental Policy Graduate Program  
Telephone: (302) 831-8405  
<http://ceep.udel.edu/>  
Faculty Listing: <http://ceep.udel.edu/people/index.html>

#### Program Overview

The graduate program in Energy and Environmental Policy prepares students to contribute to the improvement of environmental and energy policy through the development of an interdisciplinary understanding of the interactions of society, resources, and the environment. The program is administered by the Center for Energy and Environmental Policy (CEEP) and is supported by faculty and research centers of the Colleges of Engineering, Agriculture and Natural Resources, Arts and Sciences, and Business and Economics.

#### MASTER OF ENERGY AND ENVIRONMENTAL POLICY (MEEP)

Telephone: (302) 831-8405  
<http://ceep.udel.edu/academics/masters/meep.htm>  
Faculty Listing: <http://ceep.udel.edu/people/index.html>

The 36-credit hour Master of Energy and Environmental Policy (MEEP) program can be pursued full or part time. The MEEP degree program prepares graduates to assume positions in policy analysis, planning and administration in the public, private, and non-profit sectors or continue graduate study in the environmental and energy policy field at the doctoral level.

Students may choose among 5 concentrations offered through the MEEP program: Sustainable Development, Political Economy of Energy and Environment, Disasters and Public Policy, Energy Policy, and Environmental Policy.

MEEP students complete 21 credits of required courses including two policy courses (taken in the first year), two methods courses, a six-credit social science requirement, and a three-credit science and public policy requirement. Students take an additional 15 credits of concentration or specialization electives, including the three-credit analytical paper or six-credit master's thesis.

## **ENERGY AND ENVIRONMENTAL POLICY, PhD**

Telephone: (302) 831-8405

<http://ceep.udel.edu/academics/phd/enep.htm>

Faculty Listing: <http://ceep.udel.edu/people/index.html>

The PhD degree in Energy and Environmental Policy is a research degree intended to advance interdisciplinary theory and analysis on society-environment-resource relationships and to improve the quality of research informing policy decisions in this field. Graduates of the PhD program are prepared to assume positions in academic, research and policy institutions and to provide leadership on questions of theory, analysis and research in the field. Prior completion of a master's degree in a related field is required for admission to the doctoral program.

Students may choose among 5 concentrations offered through the PhD program: Sustainable Development, Political Economy of Energy and Environment, Disasters and Public Policy, Energy Policy, and Environmental Policy. All PhD students complete a 21-credit core course curriculum. This includes six credits of advanced theory, six credits of methodological course work, a six-credit social science requirement, and three credits in science, engineering and public policy. In addition, students in the PhD normally take 15 credit hours in their area of concentration or specialization, including the 3-credit Doctoral Research Paper, and enroll for 9 credits of doctoral dissertation. All PhD students must successfully pass a Qualifying Examination administered at the end of the first year of doctoral study.

In the first year, students complete two 3-credit seminars in advanced theory. In addition, during the first year students fulfill a social science requirement by completing two courses selected from a list of 45 graduate courses ranging from environmental ethics to electricity policy and planning. Students also complete a 3-credit science, engineering and public policy requirement. Or students may substitute a 3-credit graduate course (including a tutorial course) in a natural science- or engineering-related topic to meet the science, engineering and public policy requirement.

Qualifying Examinations in Theory, Methodology and Policy Analysis are conducted in June and also during the Winter Term. Students who have completed all first-year required courses take the next available Qualifying Examination. The

examination emphasizes the interconnected nature of theory, methods and policy analysis and serves as a diagnostic of the student's preparedness to develop doctoral-level, interdisciplinary research advancing the field of energy and environmental policy.

The second year of the PhD program is devoted to course work that prepares the student to conduct doctoral-level research in their intended area of research concentration or specialization. Students are responsible, in consultation with their Guidance Committee, for selection of an area of research concentration or specialization (15 credit hours). Upon approval of the doctoral research paper, the student is admitted to doctoral candidacy and begins work on a dissertation.

## **Materials Science and Engineering (MMSE, PhD)**

Telephone: (302) 831-2062

<http://www.mseg.udel.edu/>

Faculty Listing: <http://www.mseg.udel.edu/directory/faculty.html>

### **Program Overview**

The Department of Materials Science and Engineering offers programs leading to the degrees of Master of Materials Science and Engineering (MMSE) and Doctor of Philosophy (Ph.D). The Master's degree can be obtained with by either thesis or non-thesis options.

The goal of Materials Science is to provide improved materials for society. Current new materials technologies demand materials scientists and engineers who can relate the processing, structure, and properties of a broad range of materials. The Master's program offers a foundation in the science of materials and their uses. The Ph.D program offers a development of the student's ability to conduct original and creative research. The areas of study within the program include:

Materials chemistry - design and synthesis of novel materials by combining chemical architectures that have specific properties, e.g., electrical conductivity, rigidity, flexibility, solubility, etc.

Polymers - interrelations among processing, microstructure and behavior of polymeric solids and thin films.

Electronic materials - electrical, magnetic, optical and thermal behavior of materials, including semiconductors, photovoltaics, superconductors, electro luminescent polymers, and devices.

Composite materials - manufacturing, microstructure, and properties of composite materials.

Biomolecular materials - synthesis and characterization of novel chemical architectures that incorporate peptide and nucleotide sequences; bio-inspired materials, protein polymers.

Nanoscale materials - synthesis, characterization and processing of materials at length scales where bulk "properties" are modified.

### Research Facilities

Since the primary goal of the Department of Materials Science and Engineering is to foster the development of Materials Science in general at The University of Delaware, we are committed to acquiring, operating and maintaining a wide range of experimental equipment. In addition to the usual laboratory equipment, the Department operates an Electron Microscope Laboratory, a Vibrational (Raman, IR) Spectroscopy Laboratory, and an X-ray Laboratory as facilities which are available to researchers who may need them in the course of their work. A wide range of analytical, computing, synthesis, and fabrication facilities are also available within the College of Engineering.

### Financial Aid

Please refer to Graduate Fellowships and Assistantships for more information.

### Requirements For Admission

Applicants are expected to have:

- A baccalaureate degree in Materials science, in an Engineering discipline or in a Physical science.
- An undergraduate grade-point average in Engineering, Science, and Mathematics courses of 3.2 on a 4.0 scale.
- A minimum of three (3) letters of strong reference from former teachers and/or supervisors.
- A minimum combined verbal and quantitative score of 1150 on the Graduate Record Examination Aptitude Test.
- The Test of English as a Foreign Language for students whose first language is not English and who have not received a degree from a college or university in which English is the sole language of instruction. (Minimum score: 550 on paper based TOEFL; 213 on computer based TOEFL 79 on IBET TOEFL.)

Admission is selective and competitive based on the number of well qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission.

### Requirements For The Degrees

For the Masters (MMSE) degree with thesis, 24 credit hours of course work and 6 credits of thesis work on a research topic are required. Of the 24 credits of course work, 9 credits are elective and are chosen in an area of specialization after discussion with the student's advisor.

For the Masters (MMSE) degree without thesis, 30 credit hours of course work are required. Of the 30 credits of course work, 15 credits are elective and are chosen after discussion with the student's adviser and will usually be related to the student's area of interest. The non-thesis Masters (MMSE) degree is offered specifically for off-campus, part-time students and is not available to full-time graduate students.

For the Doctor of Philosophy (Ph.D) degree, 12 credits of coursework are required beyond those necessary for the Master's (MMSE) degree. The candidate must pass a qualifying examination. Subsequently, the student conducts research on a topic with an adviser of his/her own choosing. The dissertation must be of publishable quality as judged by the senior materials faculty. Finally, the student must pass an oral examination on the dissertation.

Part-time graduate education is available through the Engineering Outreach Program.

All graduate students must maintain a cumulative grade-point index of 3.0.

### Facility Of Expression In English

It is a requirement of the Department that students demonstrate an ability to express themselves orally in a clear and professional manner. Each candidate must present his or her research results in a departmental colloquium. Mechanical Engineering (MEM, MSME, PhD)

### **Mechanical Engineering**

Telephone: (302) 831-2421

<http://www.me.udel.edu>

Faculty Listing: <http://www.me.udel.edu/People/people.html>

## Program Overview

The Department of Mechanical Engineering offers graduate programs leading to the degrees of Master of Science in Mechanical Engineering (MSME), Master of Engineering: Mechanical (MEM) and Doctor of Philosophy (PhD) in mechanical engineering.

The graduate programs are designed to provide a broad based extension of the undergraduate experience through a combination of formal course work and research in the student's selected area of specialization. Independent research is required for both the MSME and PhD degrees, while the MEM is a non-thesis degree program designed for part-time students. The Department also offers a 4+1 BME/MEM program that allows the student to complete both the BME and MEM degrees in five years of full-time study. The Department also offers enrollment into the PhD program directly after the Bachelor's degree in Mechanical Engineering.

## Research Facilities And Opportunities

The research opportunities in the department cover essentially all fundamental fields of mechanical engineering including solid and fluid mechanics, materials, dynamics, thermodynamics and heat transfer. Applied and interdisciplinary research in the department is focused in five areas: biomedical engineering, clean energy, composites and nanotechnology, robotics and control, and atmospheric and environmental fluid mechanics.

Students benefit from the cross-disciplinary research conducted through several centers affiliated with department faculty. Founded in 1974 within the University of Delaware's College of Engineering, the Center for Composite Materials (CCM) is an internationally recognized, interdisciplinary center of excellence for composites research and education. CCM's Composites Manufacturing Science Laboratory houses state-of-the-art composites manufacturing, characterization, testing, and computational research equipment.

The Center for Biomedical Engineering Research provides a framework for interdisciplinary research in the general area of biomedical engineering. Topics include the generation of force and motion in the human body, orthopedic and rehabilitation engineering, joint lubrication, tissue engineering, sports medicine, and biofluid mechanics.

The Center for Fuel Cell Research supports research to improve the understanding of fuel cell materials and processes by facilitating coordination amongst the approximately 20 UD faculty members working in this area. The CFCR also encourages interactions and collaborations with industries involved in fuel cells and hydrogen infrastructure activities.

While the major focus of clean energy research is on the improvement of performance and durability of fuel cells, other topics include wind and ocean-current energy, and vehicle-to-grid technology.

Composites and nanotechnology research involves characterization, modeling and processing of heterogeneous and nanostructured materials. Composites research is focused on process modeling and manufacturing, mechanics and multiscale modeling, durability, and temperature dependent behavior. Nanotechnology research encompasses nanotubes, nanofibers, nanoclays and their composites.

Current research areas in robotics and control are design of novel robotic systems, coordination and control of multi-degree-of-freedom robot systems, intelligent small machines, and control of dynamic systems.

Atmospheric and environmental fluid mechanics deal with naturally occurring flow systems and their impact on contaminant transport in air and groundwater at all scales as well as weather, climate, and the water cycle.

The department is housed in the Robert L. Spencer Laboratory, containing modern facilities for a wide range of computational and experimental projects. Among the facilities are particle image velocimeters, scanning and transmission electron microscopes, high-vacuum chambers, mechanical- and ballistic-impact-testing systems, robots, fuel cell test stands, high speed infrared thermographic camera, tension and compression split Hopkinson bars, 3-D printer, fully equipped 6-camera gait analysis laboratory, telemetered and wired EM6 amplifiers, ultrasound, and extensive research-grade electronic instrumentation. A fully staffed and equipped machine shop with a CNC lathe and miller support the research programs.

A wide variety of other research facilities are available throughout the college and university.

## Requirements for Admission

The following minimum criteria apply:

- A baccalaureate degree in mechanical engineering or in a closely allied field of science or mathematics.
- An undergraduate grade point average in engineering, science and mathematics courses of at least 3.0 on a 4.0 scale.
- A minimum of at least three letters of strong support from former teachers or supervisors.
- A minimum combined Quantitative and Verbal score of 1200 in the Graduate Record Examination Aptitude Test.
- The Test of English as a Foreign Language for students whose first language is not English. (Minimum score: 600 on paper based TOEFL or equivalent.)

Admission is selective and competitive based on the number of well qualified applicants and the research opportunities available with the faculty. Meeting the stated minimum academic requirements does not guarantee admission.

## Financial Aid

Awards of financial assistance are made on the basis of merit and students who complete applications by January 15 are given preference. Please refer to Graduate Fellowships and Assistantships for more information.

## Requirements For The Degrees

The Master of Science in Mechanical Engineering degree requires a minimum of 24 credit hours of course work beyond the bachelor's degree and a thesis equivalent to 6 credit hours. Courses for this degree may be selected from a range of fundamental and applied topics in mechanical engineering.

The Master of Engineering: Mechanical degree requires the completion of 30 credit hours of course work beyond the bachelor's degree and does not require a thesis. Courses for this degree may be selected from a range of fundamental and applied topics in mechanical engineering.

The Bachelor of Mechanical Engineering/ Master of Engineering Mechanical (4+1 BME/ MEM degree program) for highly-qualified undergraduate students. This program allows the student to earn both the BME and the MEM degree in 5 years of full-time study in Mechanical Engineering at the University of Delaware.

Students would normally apply in the spring of their junior year.

The doctoral program in mechanical engineering allows considerable flexibility in setting up a plan of study that best suits the student's individual needs and interests. It is possible to pursue the PhD degree directly after a bachelor's degree. Students must pass the Qualifying Exam within one year of starting the doctoral program.

## Ocean Engineering (MS, PhD)

Telephone: (302) 831-2442

<http://www.engr.udel.edu/home/index.html>

Faculty Listing: <http://www.engr.udel.edu/directory/faculty.html>

## Program Overview

The Ocean Engineering program offers Master of Science and Doctor of Philosophy degrees through a cross-disciplinary program operated jointly by the Physical Ocean Science and Engineering (POSE) program in the Graduate College of Earth, Ocean, and Environment (CMES) and the Ocean Engineering program of the Department of Civil and Environmental Engineering. Additional information about the two academic units is available at the web-sites: <http://www.ocean.udel.edu> (The Graduate College of Earth, Ocean, and Environment) <http://www.coastal.udel.edu> (The Department of Civil and Environmental Engineering, Center for Applied Coastal Research)

Subject to the admission requirements below, students matriculating through CEOE have the option of pursuing advanced degrees in Marine Studies through CEOE or the cross-disciplinary degree in Ocean Engineering. Students matriculating through the College of Engineering have the option of pursuing advanced degrees in Ocean Engineering or in Civil and Environmental Engineering.

## Requirements For Admission

The minimum requirements for admission to a graduate program for a Master of Science or Doctor of Philosophy in Ocean Engineering are as follows: a Bachelor of Science in engineering, an undergraduate grade point average of at least 3.0 (out of a possible 4.0), GRE scores (verbal and quantitative combined) of at least 1200, and a TOEFL score (for international students) of at least 600 on the paper based TOEFL; 250 on computer based TOEFL; 100 on IBET TOEFL. The POSE graduate committee may increase these

minimum requirements.

Students with bachelor's degrees and exceptional academic backgrounds may be admitted directly into the PhD program. Students admitted into the MS program may petition to move into the PhD program before completing the MS

Students considering doctoral study must have completed all previous graduate studies with at least a 3.5 grade point average and have clearly demonstrated a capacity for independent work. If a MS thesis or other comprehensive work was written at another institution, a copy of the thesis will be provided to the advisor when the student enrolls at University of Delaware.

Students will be assigned an advisor upon admission to the Ocean Engineering program and will be enrolled in the academic unit that is the home of the advisor (Department of Civil and Environmental Engineering in the College of Engineering or the POSE program in the College of Earth, Ocean, and Environment).

#### Financial Aid

Please refer to Graduate Fellowships and Assistantships for further information.

#### Requirements For The Master's Degree

The Ocean Engineering program is aimed at providing graduate students with advanced technical training in ocean science and engineering for positions in the public and private sectors and for matriculating into PhD programs.

**General Requirements:** The Ocean Engineering Master of Science requires a minimum of 30 credit hours. This includes a thesis and dependent research. Students shall defend their thesis in an open oral examination chaired by the advisor. Students may earn up to six credits for their thesis.

#### \*Required Courses:

MAST 691/CIEG 639

Ocean Fluid Dynamics

MAST 882 Physical Ocean Science and Engineering Seminar

or

CIEG 865 Civil Engineering Seminar

MEEG 690 Intermediate Engineering Mathematics

MAST 693 Waves in the Marine Environment

or

#### CIEG 672/MAST 648

#### Wave Water Mechanics

Additional courses typically include at least 9 credits at the graduate level with 6 credits at the 800 level. Approval for the course curriculum is made by the student's advisor. Petitions for required course substitutions may be made via the advisor to the program director. A maximum of 9 graduate course credits from other universities may be applied toward the Master's degree.

#### Requirements For The PhD Degree

The Ocean Engineering PhD program is aimed at training graduate students to achieve the highest level of proficiency in research. The doctoral program is planned around a central engineering objective. The total program is comprised of 72 credits beyond the bachelor's degree that include a minimum of 36 credits of coursework, 6 credits for the Master's Thesis (if applicable), 9 credits for the PhD Dissertation, and a minimum of 9 credits for research. For students holding a master's degree in an appropriate field of study, the coursework from the master's degree will be taken into account in the design of the doctoral program. All graduate students work in close cooperation with the faculty on their dissertation area.

#### General Requirements

**Residency Requirement:** The student must meet a campus residency requirement of at least one continuous academic year. If a student has earned a master's degree at the University of Delaware, this can be used to fulfill the residency requirement.

**Qualifying Exam:** The qualifying examination is usually taken near the completion of the required credits of coursework beyond the bachelor's degree.

**Required Courses:** All courses in the program are selected with the approval of the student's advisor. The program requires a minimum of 36 credits in graduate courses beyond the Bachelor of Science degree. The purpose of the course work is to provide a solid foundation for original research in the field of study and, within the limits of available time, to extend the student's knowledge outside that field. The required courses beyond the Bachelor of Science are as follows:

## College of Health Sciences

CIEG 639/MAST 691	Ocean Fluid Dynamics
CIEG 672/MAST 648	Water Wave Mechanics
MEEG 690	Intermediate Engineering Mathematics
MEEG 691	Advanced Engineering Mathematics
MAST 693	Waves in the Marine Environment
MAST 882	Physical Ocean Science and Engineering Seminar
CIEG 865	Civil Engineering Seminar

Students matriculating from other universities may petition to have these courses waived if their course of study included equivalent courses. At least 6 credits should be taken outside of the Program of Ocean Science and Engineering and may include significant components from other departments.

## College of Health Sciences

### Behavioral Health and Nutrition

Telephone: (302) 831-2252

<http://www.udel.edu/bhan>

Faculty Listing: <http://www.udel.edu/chs/facultystaff/index.html#bhan>

The department offers graduate programs leading to Master of Science degrees in Health Promotion (non-thesis,) and Human Nutrition (thesis and non-thesis options.) The department also offers a post-baccalaureate dietetic internship certificate program.

To ensure consideration for admission to one of these degree programs, a completed Admission Application should be submitted no later than January 15 for the fall semester and September 15 for the spring semester. Admission application forms are available from the Graduate Office, from the department, and online at: (<http://www.udel.edu/gradoffice/apply>)

International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not their first language. The University requires departments to use an official paper-based TOEFL score of 550 or better or 213 or better on the computer-based TOEFL or 79 on the IBET TOEFL for an applicant to be considered for admission. The University expects a minimum score of 18 on the Internet-based Speaking Test. TOEFL scores more than two years old cannot be validated or considered official.

A limited number of teaching assistantships/ tuition scholarships are available on a competitive basis. To be eligible the student must complete an application file and must be qualified for admission in regular status. Funding decisions are made separately from admission decisions. First priority is given to thesis students. Please refer to Graduate Fellowships and Assistantships for more information.

### Graduate Programs

**M.S. in Health Promotion** – This interdisciplinary program prepares professionals for the successful design, implementation, and evaluation of health promotion interventions, with graduates having the skills and knowledge to produce positive impact on health behaviors. **M.S. in Human Nutrition** – This program provides advanced training in Nutrition and includes both thesis and non-thesis (scholarly project) options, with available linkages to the State Divisions of Aging and Public Health, the University Wellness Center, and local health care facilities.

**Dietetic Internship** – This innovative, distance-learning, computer-based internship program for individuals who are seeking the registered dietitian (R.D.) credential, won a national award in 2003.

<http://www.udel.edu/NTDT/internship>.

### MS In Health Promotion

Telephone: (302) 831-6681

[http://www.udel.edu/bhan/graduates/health\\_promotion.html](http://www.udel.edu/bhan/graduates/health_promotion.html)

Faculty Listing: <http://www.udel.edu/chs/facultystaff/index.html#bhan>

### Program Overview

The Master of Science in Health Promotion prepares professionals for the successful design, implementation, and evaluation of health promotion interventions. Students are prepared in the science and art of helping people change their lifestyle and behaviors through a combination of efforts that involve cognitive and behavioral modification, and environmental and cultural change. The program is designed to meet the needs of both traditional graduate students and working professionals, with graduates having the skills and knowledge to work with a wide variety of populations and in diverse settings. The program provides opportunity to pursue specific areas of emphasis within Health Promotion which can include but is not limited to: exercise science, aging, nutrition, social marketing, health psychology, health communications, worksite health, or customized study.

## Requirements For Admission

Students will be admitted to the program based upon enrollment availability and their ability to meet the following entrance requirements.

- A bachelor's degree based on a four-year curriculum from an accredited college or university.
- Acceptable undergraduate transcripts.
- Three letters of recommendation indicating the capability, interest, maturity, scholastic, and professional potential of the candidate for graduate study.
- Adequate preparation in health as determined by the prerequisite requirements.
- Acceptable GRE scores (combined math and verbal score of 1050).

## Recommended Prerequisites

All prerequisites are subject to individual review by the Health Promotion Graduate committee.

Specific prerequisites for the program are:

- Psychology
- Sociology
- Statistics
- Equivalent of 3 topical health-related courses  
Health Promotion or Community Health

## Programming course

Admission is selective and competitive, based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. See Graduate Admissions for additional information.

## Financial Aid

Available financial aid will be awarded to full-time students (registered in at least 6 graduate credits each semester) based on admission ranking, needs of the program, and experience and expertise of the graduate student. Students who receive financial aid will be obligated to work up to 20 hours per week in an assigned position during the fall and spring semesters. Some forms of financial aid may provide support for tuition while others may not. Continuation of this award is contingent upon the evaluation of the program director and Health Promotion Graduate committee. The student must remain in good academic standing to be eligible for the continuation of the award.

## Requirements for the Degree

The Master of Science in Health Promotion requires 30 credit hours of coursework at the 600 and 800 level, and 3 credits of either an internship or research project. The 30 credits of coursework must include 18 credits of required courses, and 12 credits of advisor approved coursework.

### Credit Requirements:

Core Credits	18
Area of Emphasis	6
Electives (advisor approved)	6
Internship or Research Project	3
Total number of required credits	33

### A. Courses Required Within Health Promotion

BHAN609	Survey Research Methods
KAAP 602	Data Analysis and Interpretation in Health Sciences
HLPR 803	Advanced Health Promotion Programming
HLPR 807	Topics and Issues in Health Promotion
HLPR 809	Health Behavior
HLPR 823	Human Response to Stress
Total Credits from Area A	18

### B. Area of Emphasis

Areas of Emphasis can be related to exercise, social marketing and health communication, nutrition, aging, or another area of interest to a student. Courses that can be applied to an area of emphasis are many, and students are required to meet with their adviser to determine their course selections.

#### Exercise Science Emphasis (6 credits)

KAAP675	Exercise Testing and Prescription
KAAP655	Advanced Physiology of Exercise

#### Cardiac Rehabilitation Emphasis (6 credits)

KAAP675	Exercise Testing and Prescription
KAAP665	12 Lead ECG Interpretation

#### Nutrition Emphasis (6 credits)

NTDT 640	Nutrition and Aging
NTDT 645	Teaching Methods: Nutrition and Foods
NTDT 615	Advanced Nutrition and Physical Activity
NTDT 660	Community Nutrition

#### Aging Emphasis (6 credits)

NTDT 640	Nutrition and Aging
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HDFS 803 Human Development:  
Lifespan Perspective  
HDFS 600 level or higher Aging related course

C. Recommended Electives (12 credits)

HLPR 610 Health and the Media  
HLPR 819 Social Marketing  
UAPP 657 Health Policy  
UAPP 804 Program Evaluation for Health and  
Social Services  
UAPP 808 Qualitative Methods for Program  
Evaluation  
HDFS 601 Theories of Human Development  
HDFS 642 Leadership in Human Services  
SOC 607 Sociology of Gender  
COMM 610 Organizational Communication  
Theory  
COMM 624 Media Message Analysis  
COMM 654 Children and Mass Media  
KAAP655 Advanced Physiology of Exercise  
COMM 656 Communication in Organizations  
COMM 657 Children, Television, and Education  
EDUC 685 Multimedia Literacy  
POSC 653 Politics and Healthcare

D. Internship or Research Project

HLPR 864 Internship  
or  
HLPR 868 Research Project  
Prior to enrollment in either HLPR 864 or HLPR  
868 students must successfully pass a Qualifying  
Exam.

## **MS IN HUMAN NUTRITION**

Telephone: (302) 831-1006  
[http://www.udel.edu/bhan/graduates/human\\_nutrition.html](http://www.udel.edu/bhan/graduates/human_nutrition.html)  
Faculty Listing: <http://www.udel.edu/chs/facultystaff/index.html/#bhan>

### Program Overview

The MS program in Human Nutrition is supported with well-equipped research facilities. Additional linkages available to support graduate research opportunities for students in this program include Delaware Cooperative Extension, the State Division of Aging, the State Division of Public Health, the University Wellness Center, and local health care facilities. Interdisciplinary work is encouraged. There is also opportunity for close liaison with programs in Human Development and Family Studies, Animal and Food Sciences, Chemistry and Biochemistry, Biological Sciences, and Nursing, as well as with the other master's programs in the department.

### Requirements For Admission

Requirements for admission include an undergraduate cumulative index (based on a 4.0 system) of 2.75 with a 3.00 average in the major field. The recommended minimum combined verbal and math GRE score is 1000. International students applying for a teaching assistantship must report a paper-based TOEFL score of at least 600 (250 or better on the computer-based TOEFL or 100 on the IBET TOEFL) and Test of Spoken English (TSE) score of at least 45. A score of 575 or better (231 or better on the computer-based TOEFL) is required or 90 on the IBET TOEFL for international students who do not apply for a teaching assistantship. Three letters of reference from individuals able to evaluate the applicant's potential for successful graduate work are also necessary to complete the application file. See Graduate Admissions for more information.

Prerequisite courses to regular status include: human or animal physiology, inorganic and organic chemistry, biochemistry (preferably with lab), and one semester of human nutrition having a biochemistry prerequisite. Students planning to pursue thesis research topics related to social science aspects of nutrition and food habits should have some courses in sociology, psychology, anthropology, etc.

Students seeking to enter the program from undergraduate majors other than nutrition should expect to take prerequisite courses in sciences and nutrition prior to admission on regular status.

Admission to the program is selective and competitive based on the number of applicants and limits of available faculty and facilities. Those who meet minimum academic requirements are not guaranteed admission.

### Requirements For The Degree

#### Thesis Option

A minimum of 31 credits at the graduate level is required, 6 of which are thesis-related and 13-17 credits in the Department of Behavioral Health and Nutrition (1 seminar credit and 13-16 course credits). The remaining credits are obtained through courses in related areas such as chemistry, biology, statistics/experimental design, food science, physical education, psychology, sociology, anthropology, communication, etc. Selection of these courses will depend in part on the specific needs of the student and on the student's professional or

research interests.

Core course requirements include: NTD 611 (Advanced Nutrition), NTD 630 (Trace Minerals and Vitamins) a graduate level biochemistry course, and a graduate level course in statistics/experimental design.

Degree completion also requires:

- presentation of thesis research results in seminar format to the departmental faculty,
- submission of manuscript draft for publication, and
- satisfactory performance on the final oral examination.

#### Non-Thesis Option

A minimum of 31 credits at the graduate level is required, including 16 credits of graduate nutrition courses and a 3 credit scholarly project. The remaining 15 credits are obtained through non-program courses in related areas. Degree completion also requires satisfactory performance on a written comprehensive examination and presentation of scholarly project at a department seminar.

### **Biomechanics and Movement Science (MS, PhD)(Interdisciplinary Program)**

Telephone: (302) 831-1543

<http://www.bmsc.udel.edu>

Faculty Listing: <http://www.bmsc.udel.edu/Faculty.htm>

email: [ud-bioms@udel.edu](mailto:ud-bioms@udel.edu)

#### Program Overview

The Biomechanics and Movement Science (BIOMS) program offers programs leading to master's and doctoral degrees. It is an interdisciplinary program that combines faculty and physical resources from several different units including the Department of Biological Sciences, the Department of Mechanical Engineering, the Department of Physical Therapy, the Department of Kinesiology and Applied Physiology, the Department of Electrical and Computer Engineering, the Delaware Rehabilitation Institute, and the Center for Biomedical Engineering Research. By implementing an interdisciplinary approach, the availability of faculty members with backgrounds in sport biomechanics, physical therapy, applied physiology, engineering, and computer science, affords students a much more diverse educational environment. In

addition, the collective research laboratories of the participating units provide exposure to outstanding facilities. The laboratories of the Sports Science Lab, the Department of Physical Therapy, the Department of Mechanical Engineering, the Center for Biomedical Engineering Research and others present an array of equipment for the study of human movement and exercise as well as biomechanics. Laboratories in the Departments of Biological Sciences and Mechanical Engineering provide equipment for the study of tissue and molecular biomechanics as well as rehabilitation.

#### Requirements for Admission

Applicants to the BIOMS program should meet the minimum recommended GRE requirements of 1050 on combined quantitative and verbal scores, and an undergraduate grade point index of 3.0. Applicants are expected to have course experience in the areas of math (through calculus), anatomy/physiology, physics (2 semesters), and chemistry (2 semesters). See Graduate Admissions for additional information.

Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty, funding and facilities. Those applicants who meet the stated minimum academic requirements for admission are not guaranteed admission, nor are those applicants who fail to meet those minimum requirements necessarily precluded from admission if they offer other appropriate strengths.

Applicants are required to identify a faculty member with appropriate expertise who will serve as their advisor throughout the degree program. Applicants will be considered for admission to the BIOMS program provided that they 1) meet all admission requirements of the Office of Graduate and Professional Education and the BIOMS program, and 2) are successful in securing a faculty advisor, and 3) are approved by the BIOMS Executive Committee.

#### Financial Aid

Financial assistance for students in the BIOMS program is obtained from a variety of external sources and will therefore vary in form and availability. Assistance will be awarded on a competitive basis to applicants best fitting the needs of the granting agencies and sponsoring faculty. Students receiving full stipends will be expected to work up to 20 hours per week on faculty projects, and are expected to maintain full-time status. Please refer to Graduate

Fellowships and Assistantships for more information.

### Requirements for the Degrees

Individualized plans of study in one of the five approved Areas of Study: Applied Anatomy and Biomechanics, Applied Physiology, Motor Control and Behavior, Rehabilitation Engineering, and Tissue and Molecular Biomechanics, are created to serve the interests of both the student and sponsoring faculty member. Core courses for all areas of study include 2 (MS) or 3 (PhD) semesters of BIOMS seminar, an experimental design/statistics course, a course in computing, laboratory instrumentation or engineering applications, and two courses outside the principal area of study.

The master's degree program requires 24 credit hours of coursework (including BMSC 865 and BMSC 868) plus 6 credit hours of thesis. The student is expected to submit a plan of study by the end of the first semester, created with their primary advisor. This program of study must be reviewed and approved by the Executive Committee of the BIOMS Program. The thesis committee must consist of at least three BIOMS faculty members, and at least one of the committee members must be from a different department than that of the advisor. Prior to conducting the thesis research, the student must successfully defend the thesis proposal before the BIOMS faculty. The final thesis defense must then be approved by the thesis committee.

The PhD program requires 33 credit hours of coursework (including BMSC 865 and BMSC 868) beyond the master's degree plus 9 credit hours of dissertation. Students with bachelor's degrees who wish to earn a PhD need to complete a master's degree before their status is changed to a PhD student. Students with a bachelor's degree and a professional doctorate enter the PhD program. As with the master's degree, the student's plan of study should be created by the student and his/her advisor by the end of the first semester. This program of study must then be reviewed and approved by the Executive Committee of the BIOMS program. The dissertation committee must consist of at least three BIOMS faculty members one of whom must be from a department different than that of the advisor, and one committee member from outside the BIOMS program. Please refer to the program policy statement for more specific details regarding dissertation committee membership. Prior to conducting the dissertation, the student must successfully

defend the dissertation proposal. The defense of the dissertation proposal constitutes the qualifying examination for candidacy into the PhD degree program. Candidacy is completed when the student successfully defends the dissertation.

### Physical Therapy (DPT)

Telephone: (302) 831-8910

<http://www.udel.edu/PT>

Faculty Listing: <http://www.udel.edu/PT/About%20Us/directory.html>

### Program Overview

The Physical Therapy Department offers a Doctorate of Physical Therapy (DPT) degree program. This entry-level degree program qualifies the graduate to sit for the physical therapy licensure examination in any state in the country. The Commission on Accreditation in Physical Therapy Education accredits the program.

The Physical Therapy Department is housed in McKinly Laboratory and has modern well-equipped laboratories for research, teaching, and clinical practice. In addition, there are two on-site physical therapy practice clinics, which are staffed by licensed physical therapists.

### Requirements for Admission

Candidates with baccalaureate degrees from accredited colleges and universities will be eligible to apply for admission into the Doctorate in Physical Therapy graduate program. Applicants must follow the application procedures outlined on the Physical Therapy Department website (<http://www.udel.edu/PT/Study%20With%20Us/applicationprocedures.html>). Thirty-six students will be admitted annually to the program.

Admission to the program is competitive. Acceptance is based on demonstrated academic excellence, evidence of physical therapy clinical experience, the required essay, and letters of recommendation.

Acceptance will be based on the stated criteria and not based on race, sex, creed, or national origin.

It is recommended that candidates review the core performance standards, found in the DPT Program Policies and Procedures Manual, on our website prior to submitting their application.

The minimum entrance requirements for the graduate entry-level physical therapy program will be:

- A bachelor's degree from an accredited institution
- Graduate Record Examination Scores (meeting or exceeding minimum)
- Documented volunteer or paid clinical experience in physical therapy (100 hours minimum)
- Three letters of recommendation (2 from licensed Physical Therapists; 1 from an upper-level Professor)
- If requested, an interview with the admissions committee.

Students whose first language is not English must achieve a minimum score of 550 (paper-based test) or 79 (Internet-based test, IBT) on the Test of English as a Foreign Language (TOEFL)

Prerequisite coursework requirements are:

- English Writing - 1 course (3 credits)
- Psychology - Introductory - 1 course (3 credits)
- Psychology - Upper Level - 1 course (3 credits)
- Statistics - Introductory - 1 course (3 credits)
- Calculus - Introductory - 1 course (3 credits)
- Chemistry w/ lab - Introductory - 2 courses (8 credits)
- Physics w/ lab - Introductory - 2 courses (8 credits)
- Biology w/ lab - Introductory - 2 courses (8 credits)
- Human or Mammalian Physiology - 1 course (3 credits)

Requirements for the Degree

The DPT program requires 105 hours of graduate course work. These hours are in such areas as didactic instruction, experiential laboratories, research, clinical internships and other equivalent academic experiences. Full-time clinical internships comprise 12 credit hours of the curriculum and occur at a variety of health care facilities located primarily on the east coast. The program is full-time and of two and one-half years duration, including all summer and winter sessions. Part-time matriculation is not typically permitted.

### **Kinesiology and Applied Physiology**

Telephone: (302) 831-4909

<http://www.udel.edu/kaap>

Faculty Listing: [www.udel.edu/chs/facultystaff/index.html#kaap](http://www.udel.edu/chs/facultystaff/index.html#kaap)

The Department of Kinesiology and Applied Physiology offers graduate programs leading to the Doctor of Philosophy degree in Applied Physiology and the Master of Science degree in Exercise Science. Students in the Exercise Science program select a major area of study in Biomechanics, Exercise Physiology, Clinical Exercise Physiology, Motor Control, or Sports Medicine. Students in each master of science program may complete degree requirements on a full-or part-time basis.

To ensure consideration for admission to one of these degree programs, a completed Admission Application should be submitted no later than January 15 for the fall semester and September 15 for the spring semester. Admission application forms are available from the Graduate Office, from the department, and online at: (<http://www.udel.edu/gradoffice/apply/>).

International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not their first language. The University requires departments to use an official paper-based TOEFL score of 550 or better or 213 or better on the computer-based TOEFL or 79 on the IBET TOEFL for an applicant to be considered for admission.

A limited number of teaching assistantships/ tuition scholarships are available on a competitive basis. To be eligible the student must complete an application file and must be qualified for admission in regular status. Funding decisions are made separately from admission decisions. First priority is given to thesis students. Please refer to Graduate Fellowships and Assistantships for more information.

### **MS IN EXERCISE SCIENCE**

Telephone: (302) 831-8006

<http://www.udel.edu/kaap>

Faculty Listing: <http://www.udel.edu/chs/facultystaff/index.html#kaap>

#### **Program Overview**

The MS program in Exercise Science is supported with well-equipped research facilities, including three-dimensional video capabilities, electromyography, and force platforms, as well as equipment for measurement of cardiovascular and cardiopulmonary function, bone mineral density, body composition, functional muscular capacity, blood lactate, and motor unit discharge. Graduate students in this program are expected to participate in ongoing faculty-directed

research programs.

### Admission Requirements

The Exercise Science Graduate Program Committee makes admission decisions. Students will be admitted to the program based upon enrollment availability and their ability to meet the following recommended entrance requirements.

- Baccalaureate degree from an accredited college or university
- Acceptable undergraduate transcripts including an undergraduate GPA of 3.0 or higher
- The equivalent of an undergraduate major in kinesiology, exercise science or related discipline
- Acceptable GRE scores (over 1050 combined math and verbal scores)
- Three letters of recommendation indicating the capability, interest, maturity, and scholarly potential of the candidate for graduate study
- Acceptance by a primary advisor

Recommended prerequisites for Biomechanics include:

- Math through calculus
- Anatomy
- One year of physics
- Computer programming experience

Recommended prerequisites for Exercise Physiology and Clinical Exercise Physiology include:

- One year of biology
- Two years of chemistry
- One year of physics

Recommended prerequisites for Motor Control and Sports Medicine include:

- Math through calculus
- Anatomy and physiology
- One year of biological or physical science

Admission is selective and competitive, based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission, if they offer other appropriate strengths. See the Admission Information chapter in this catalog for additional information.

### MASTER OF SCIENCE IN EXERCISE SCIENCE

The Master of Science with a major in Exercise Science requires 27 credits of coursework at

the 600 or 800 level, and 6 credits of thesis. The 27 credits of coursework are specified in the individual planned programs of study, and must include 18-21 credits of coursework in courses within Exercise Science, and 6-9 credits of coursework in cognate areas as specified by the requirements for each concentration.

### Master of Science in Exercise Science Concentration: Exercise Physiology

Exercise Physiology is a science that studies the effect of physical activity on the systems of the human body. Opportunities are available in scientific research, physiological assessment, cardiac rehabilitation, and exercise prescription. Students in the MS program in exercise physiology are required to conduct research and complete a thesis.

#### Credit Requirements:

Credits within Exercise Science	18-21
Cognate areas outside Exercise Science	6-9
Thesis	6
Total number of required credits	33

#### A. Required Credits Within Exercise Science

KAAP 601	Research Methods	3
KAAP 602	Data Analysis and Interpretation in Health Sciences	3
KAAP 603	Seminar in Exercise Science (4 semesters required)	3
KAAP 655	Advanced Physiology of Exercise	3
KAAP 804	Clinical Measures in Exercise Physiology	3

At least one of the following courses

KAAP675	Exercise Testing and Prescription	3
KAAP802	Human Cardiovascular Control	3

Total from Area A 18-21

#### B. A minimum of 2 courses from the following:

KAAP665	12 Lead ECG Interpretation	3
KAAP650	Life Span Motor Development	3
KAAP651	Neuromechanical Basis of Movement	3
KAAP675	Exercise Testing and Prescription	3
KAAP666	Special Problem	1-6
KAAP607	Motor Learning and Control	3
HDFS605	Impact of Aging on the Family	3
BISC675	Cardiopulmonary Physiology	3

KAAP615	Advanced Mammalian Physiology I	3
KAAP616	Advanced Mammalian Physiology II	3
STAT615	Design and Analysis of Experiments	3
STAT617	Multivariate Methods	3

Total from Area B 6-9

KAAP869 Thesis in Exercise Physiology 6

Total from Area C 6

Master of Science in Exercise Science  
Concentration: Biomechanics

Biomechanics is an interdisciplinary science that objectively interprets movement in living organisms. Emphasis is placed on techniques of measuring kinematic and kinetic characteristics of living organisms and on mathematical methods of analysis. Students in the MS program in biomechanics are required to conduct research and complete a thesis.

Credit Requirements:

Credits within Exercise Science 18-21

Credits in Cognate Areas 6-9

Thesis 6

Total number of required credits 33

A. Courses Required Within Exercise Science

KAAP601	Research Methods	3
KAAP602	Data Analysis and Interpretation in Health Sciences	3
KAAP603	Seminar in Exercise Science (3 semesters)	3
KAAP627	Biomechanical Methods	3
KAAP617	Introduction to Laboratory Instrumentation	3

At least one of the following courses:

KAAP687	Seminar in Biomechanics	3
KAAP688	Electromyographic Kinesiology	3

Total Credits from Area A 18-21

B. A minimum of 2 courses from the following list:

BMSC686	Mathematics for Biomechanics	3
KAAP650	Life Span Motor Development	3
KAAP655	Advanced Physiology of Exercise	3
KAAP607	Motor Learning and Control	3
KAAP666	Special Problem	3
MEEG612	Biomechanics of Human Movement	3

MEEG682	Clinical Biomechanics	3
MEEG683	Orthopedic Biomechanics	3
STAT615	Design and Analysis of Experiments	3
STAT617	Multivariate Methods	3
EDUC862	Design and Analysis of Experiments	3
PHYT604	Functional Anatomy and Biomechanics	3

Total Credits from Area B 6-9

C.

KAAP869 Thesis in Biomechanics 6

Total Credits from Area C 6

Master of Science in Exercise Science  
Concentration: Motor Control

Motor control is an interdisciplinary science that focuses on neural, physical, and behavioral aspects of the development and regulation of human movement. Emphasis is placed on changes that occur across the lifespan or due to pathology, and adaptations that occur in response to motor learning or exercise training. Students in the MS program in Motor Control are required to conduct research and complete a thesis.

Credit Requirements:

Credits within Exercise Science 18

Credits in Cognate Areas 9

Thesis 6

Total number of required credits 33

A. Courses Required Within Exercise Science

KAAP601	Research Methods	3
KAAP602	Data Analysis and Interpretation in Health Sciences	3
KAAP603	Seminar in Exercise Science (3 semesters required)	3
KAAP607	Motor Learning and Behavior	3
KAAP651	Neurophysiological Basis of Movement	3
KAAP808	Seminar in Motor Behavior	3

Total Credits from Area A 18

B. A minimum of 2 courses from the following:

KAAP615	Advanced Mammalian Physiology I	3
KAAP616	Advanced Mammalian Physiology II	3
KAAP650	Life Span Motor Development	3
KAAP666	Special Problem	3

KAAP617	Introduction to Lab Instrumentation	3
KAAP627	Biomechanical Methods	3
STAT615	Design and Analysis of Experiments	3
STAT617	Multivariate Methods	3
EDUC682	Design and Analysis of Experiments	3
EDUC823	Learning and Development	3
PSYC612	Human Psychophysiology	3
PSYC626	Advanced Neuroanatomy	3

Total Credits from Area B 9

C.

KAAP869	Thesis in Motor Control	6
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Total Credits from Area C 6

Master of Science in Exercise Science  
Concentration: Sports Medicine

Credit Requirements:

Credits within Exercise Science 18

Credits in Cognate Areas 9

Thesis 6

Total number of required credits 33

A. Courses Required Within Exercise Science

KAAP601	Research Methods	3
KAAP602	Data Analysis and Interpretation in Health Sciences	3
KAAP603	Seminar in Exercise Science (3 semesters)	3
KAAP604	Sensorimotor Characteristics of Injury	3
KAAP605	Pathoetiology of Musculoskeletal Injury	3
KAAP606	Evidence-Based Sports Medicine	3

Total Credits from Area A 18

B. A minimum of 3 courses from the following:  
(At least 2 courses must come from the same cognate area)

Motor Control

KAAP607	Motor Learning and Control	3
KAAP650	Life Span Motor Development	3
KAAP651	Neurophysiological Basis of Human Movement	3
KAAP808	Seminar in Motor Behavior	3

Biomechanics

KAAP688	Electromyographic Kinesiology	3
KAAP617	Introduction to Laboratory	

	Instrumentation	3
KAAP627	Biomechanical Methods	3
KAAP687	Seminar in Biomechanics	3

Exercise Physiology

KAAP615	Advanced Mammalian Physiology I	3
KAAP616	Advanced Mammalian Physiology II	3
KAAP655	Advanced Physiology of Exercise	3
KAAP665	12 Lead ECG Interpretation	3
KAAP675	Exercise Testing and Prescription	3
KAAP802	Human Cardiovascular Control	3
KAAP804	Clinical Measures in Exercise Physiology	3

Research Design and Statistics

BISC643	Biological Data Analysis	3
STAT615	Design and Analysis of Experiments	3
STAT617	Multivariate Methods	3
EDUC862	Design and Analysis of Experiments	3
KAAP666	Special Problem	3
KAAP840	Advanced Human Anatomy	3

Total Credits from Area B 9

C.

KAAP869	Thesis in Sports Medicine	6
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Total Credits from Area C 6

Master of Science in Exercise Science  
Concentration: Clinical Exercise Physiology  
The concentration in Clinical Exercise Physiology provides students with the opportunity to develop an in-depth knowledge of and hands-on experiences in preventive and rehabilitative practices for patients with cardiopulmonary, metabolic, and musculoskeletal diseases as well as apparently healthy and low risk populations. The Clinical Exercise Physiologist Specialization is designed to be a 2 year, non-thesis program. Students wishing to pursue research careers or doctoral degrees may choose to complete the thesis requirements in Exercise Physiology.

Credit Requirements:

Credits within Exercise Science 15

Elective Credits 9

Internship 9

Total number of required credits 33

#### A. Courses Required within Exercise Science

KAAP655	Advanced Exercise Physiology	3
KAAP665	12 Lead ECG Interpretation	3
KAAP675	Exercise Testing and Prescription	3
KAAP615	Advanced Mammalian Physiology I	3
KAAP616	Advanced Mammalian Physiology II	3
KAAP804	Clinical Measures in Exercise Physiology	3

Total from Area A 15

#### B. A minimum of 3 courses from the following:

KAAP651	Neurophysiological Basis of Movement	3
NTDT615	Advanced Nutrition and Physical Activity	3
NTDT640	Nutrition and Aging	3
NTDT680	Exercise, Nutrition and Bone Health	3
KAAP802	Human Cardiovascular Control	3
HLPR809	Health Behavior Theory	3
HLPR815	Health and Older Adults	

Total from Area B 9

#### C. Internship

KAAP671	Clinical Exercise Physiology Internship	9
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Total from Area C 9

### PHD IN APPLIED PHYSIOLOGY

Telephone: (302) 831-8006

<http://www.udel.edu/KAAP>

Faculty Listing: [http://www.udel.edu/KAAP/fac\\_list.htm](http://www.udel.edu/KAAP/fac_list.htm)

#### Program Overview

The mission of the Applied Physiology PhD program is to provide advanced training to students in the field of Applied Physiology with the goal of preparing students for research-based careers. Areas of in-depth study are driven by faculty research and encompass cardiovascular physiology, exercise physiology, musculoskeletal physiology, and neurophysiology. The programmatic emphasis is on the regulation, adaptation, and integration of mechanisms across all levels of biological organization from molecules to organ systems. New knowledge on health, aging, chronic disease, and injury prevention will be generated and disseminated. Along with in-depth, laboratory-based immersion, the mission of the program is to

provide high quality classroom-based instruction through a core graduate curriculum, electives, and seminars.

#### Admissions Requirements

Admissions decisions are made by the Applied Physiology Program Committee. Students will be admitted to the program based on enrollment availability and their ability to meet the following minimum recommended entrance requirements:

- BS, MS or equivalent degree from an accredited college or university.
- GRE scores of at least 600 on math and at least
- An undergraduate GPA of 3.0 or higher
- Written statement of goals and objectives (the personal statement) that clearly identifies the applicant's research and curriculum interests and explains how admission to the program will facilitate his/her professional objectives.
- Current résumé and three letters of recommendation.

All students will be expected to be sufficiently conversant in English and knowledgeable in the written word to convey clear, logical and complex written expressions. Knowledge of mathematics and statistics is expected.

Admission is selective and competitive, based on the number of well-qualified applicants and the limits of available faculty and facilities.

Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. See Graduate Admissions for additional information.

#### Requirements For The Degree

The Doctor of Philosophy in Applied Physiology requires a minimum of 46 credits including 9 credits of dissertation. The program is designed to be completed in 4 years. The 46 required credits are specified in the student's plan of study and normally include:

#### Required courses (28 credits)

KAAP615	Advanced Mammalian Physiology I	3
KAAP616	Advanced Mammalian Physiology II	3
BISC631	Practice of Science	3
KAAP868	Research	12
KAAP602	Data Analysis and Interpretation	3

or  
BISC643 Biological Data Analysis 3  
KAAP801 Seminar in Applied Physiology 4  
KAAP801 Seminar taken 8 semesters, 4  
semesters for credit and 4 semesters as listener

#### Elective Courses (9 credits)

Students who have had substantially similar courses to one or more of those required prior to entering the Applied Physiology Program may substitute other appropriate courses with the approval of the advisor and the Program Committee.

Only those courses in the 600, 800, and 900 levels will apply towards the doctoral degree. Independent study courses will be accepted based on approval of the advisor and the Department Chair. A maximum of 9 independent study credits may be included in the program of study.

### Nursing

Telephone (302) 831-1255  
<http://www.udel.edu/nursing/graduates/index.html>  
Faculty Listing: <http://www.udel.edu/chs/facultystaff/index.html#nursing>

#### Program Overview

The School of Nursing offers programs leading to a Master of Science in Nursing (MSN) degree, Post-Master's Certificates and Doctor of Philosophy in Nursing.

The Masters of Science in Nursing is designed to prepare Clinical Nurse Specialists (CNS), Health Services Administrators, Family Nurse Practitioners (FNP), Adult Nurse Practitioners (ANP), and Neonatal Nurse Practitioners. Clinical specialization in the CNS concentration is offered in adult health, pediatrics, and psychiatry. Health Services Administration prepares nurses for leadership positions as nurse managers at a variety of levels. The Family and Adult Nurse Practitioner specialties prepare nurses to provide primary health care to clients. The Neonatal Nurse Practitioner specialty prepares nurses to provide acute care to newborns and their families using a collaborative team approach. Post-master's certificate programs are available in all concentrations for students who already hold a Master of Science in Nursing degree. All graduates are qualified to sit for national certifying examinations.

The Masters of Science in Nursing program includes core concepts of advanced practice

nursing as well as concepts specific to the area of specialization. The curriculum is built on the theories and professional practice obtained at the baccalaureate level of nursing education and provides a foundation for future doctoral study.

Independent and interdependent functions of nursing are emphasized as important in achieving the health goals of individuals, families, and communities. Graduates of the program are prepared to improve the quality of nursing practice and to influence the delivery of health care. Clinical resources include a wide variety of facilities in Delaware, Pennsylvania, Maryland, and New Jersey.

The majority of students attend classes on a part-time basis. All on-campus classes are held after 3:00 p.m. in order to accommodate working nurses. Online and web-enhanced delivery methods are available for selected courses. The Health Services Administration concentration is offered entirely in an online format.

The programs offered by the School of Nursing are fully accredited by the National League for Nursing Accrediting Commission (NLNAC) and from the Commission for Collegiate Nursing Education (CCNE).

The Doctor of Philosophy (PhD) in Nursing Science program prepares researchers and academic faculty for positions in college, university, and health care settings. Graduates are prepared to advance the art and science of nursing and to assume leadership positions in the profession. They will take responsibility for shaping and advancing healthcare, with a goal of improving individual, family and population health through the integration of theory, research, and evidence-based practice. The PhD in Nursing Science program emphasizes specific areas of study in which nursing makes a significant contribution towards health. These areas are defined by the research expertise of faculty in the context of interdisciplinary resources available at the University of Delaware and Delaware Health Sciences Alliance campuses and the local, national and international communities. Graduates are prepared to collaborate with other scientists and health professionals to contribute to the development of knowledge. The breadth of focus of the PhD in Nursing Science curriculum ranges from nursing research in the bio-behavioral sciences to health services.

The PhD in Nursing Science program requires 41 credit hours of coursework plus 9 credit hours

of dissertation. Students are required to work with their advisor to develop a plan of study. The plan must first be approved by the academic advisor and then the PhD in Nursing Science Program Committee by the end of the first semester of study in the program. In addition to coursework, degree completion requires successful completion of one written and oral comprehensive examination, successful defense of the dissertation proposal and successful defense of the dissertation. Please refer to the program policy statement for more specific details regarding these processes and selection of examination and dissertation committees. Students are expected to complete the program in five years.

### Health Services Administration (MS)

Telephone (302) 831-1255 <http://www.udel.edu/nursing/graduate.html>  
 Faculty Listing: <http://www.udel.edu/nursing/faculty/faculty.html>

The School of Nursing offers a concentration in Health Services Administration leading to a Master of Science degree. Admission requires that students fulfill the following requirements:

- Completion of a Bachelor's degree in a health-related field, such as nutrition/dietetics, sports medicine/exercise science, physical therapy, occupational therapy, public policy, information sciences, health education, and health promotion and wellness.
- Completion of one year of management experience in a health-related field or three years experience in professional health-related practice.
- Satisfactory performance in undergraduate academic work as well as in upper division major courses.
- Three satisfactory academic and/or professional recommendations.
- Interview with faculty from the graduate program.
- Submission of a personal statement concerning goals related to health services administration.

For students for whom English is not a primary language, a minimum score of 600 for the paper test or 250 for the computer based test is required on the Test of English as a Foreign Language. These students may be required to take the Test of Spoken English.

#### Requirements for the Degree

Completion of a minimum of 36 credits (21

credits of department core requirements; 6 credits of research design and statistics; 6 credits of non-College requirements; and 3 credits of free elective).

Three credits of practicum, which may be taken together or in one-credit blocks.

Writing of a Scholarly Project.

A colloquium presentation on the Scholarly Project.

#### CORE COURSES 21 credits

HSAD 604	Advanced Practice Roles for Healthcare Providers	3
HSAD 619	Financial Management in Health Services Administration	3
HSAD 635	Health Administration Theories	3
HSAD 637	Health Planning Strategies	3
HSAD 638	Health Services Evaluation	3
HSAD 664	Health Services Administration Practicum	3
HSAD 668	Health Services Administration Scholarly Project	1-3
HSAD 690	Colloquium	0

#### NON-DEPARTMENT COURSES 6 credits

Human Resource Management (select one) 3

UAPP 685	Personnel and Human Resource Issues	
UAPP 837	Human Resources Management in Public and Nonprofit Sectors	
	Communication Theory (select one)	3
COMM 610	Organizational Communication Theory	
COMM 642	Topics in Organizational Communication	
COMM 656	Communication in Organizations	

#### RESEARCH DESIGN AND STATISTICS 6 credits

	Research Design (select one)	3
PSYC 809	Research Design	
HDFS 815	Research Issues and Designs	
UAPP 800	Research Design and Methodologies	
HDFS615	Research Methods	
	Statistics (select one)	3
EDUC 665	Elementary Statistics	
UAPP 815	Public Management Statistics	
	Free Elective	3
Total		36

### Nursing (MSN)

Telephone (302) 831-1255 <http://www.udel.edu/nursing/graduates/index.html>  
 Faculty Listing: <http://www.udel.edu/chs/facultystaff/index.html#nursing>

#### Admission Requirements

To be considered for admission, applicants are

expected to have a baccalaureate degree in nursing from an NLNAC or CCNE accredited school of nursing. Applicants are evaluated on the following criteria: (1) satisfactory performance in undergraduate academic work as well as in upper-division nursing courses; (2) three satisfactory academic and/or professional references; (3) licensure as a registered nurse in Delaware or in the state where clinical practice is to be arranged; and (4) an interview with a faculty member from the graduate program. For international students, a minimum score of 600 on the paper Test of English as a Foreign Language or 250 on the equivalent computer-based test is required.

One year of recent clinical experience is recommended prior to starting the clinical courses for the CNS and NP students; one year management experience in a health related field or three years experience in a professional health related practice for HSAD students. Admission to the Neonatal Nurse Practitioner specialty requires an interview with NNP faculty. All applicants are considered on an individual basis.

Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. See Graduate Admissions for more information.

Students are required to meet all immunization, safety, criminal background checks, drug screenings, and CPR requirements prior to clinical coursework and direct patient care. Additional requirements for the clinical education may be required by the healthcare agency to which a student is assigned. Students are expected to provide their own transportation to all required clinical experiences.

#### Requirements For The Degree

Students in the Clinical Nurse Specialist and Health Services Administration concentrations must complete 34 and 37 credit hours of graduate study respectively for the MSN. Those pursuing the Family Nurse Practitioner specialty must complete 46 credit hours. Students in the Adult Nurse Practitioner specialty must complete 43 credit hours. Completion of the Neonatal Nurse Practitioner specialty requires 37 course credits in which the core courses are completed

at the University of Delaware and the specialty coursework is completed at Thomas Jefferson University. All students take at least 13 credits of core courses.

Students have the option of writing either a thesis or a non-thesis scholarly project to meet the program requirements or they may complete a Research Application course. Those who choose to write a thesis conduct the necessary research and receive six credits (NURS 869) for the completed study. Students must complete all course requirements within five years of matriculation into the graduate nursing program.

#### Core Courses for CNS, FNP, ANP, and NNP 22 Credits

NURS 604	Advanced Practice Roles for Health Care Providers	3
NURS 609	Nursing Science: Theory and Research	4
NURS 620	Advanced Health Assessment	3
NURS 621	Advanced Pathophysiology	3
NURS 622	Advanced Pharmacology	3
EDUC 665	Elementary Statistics	3

#### Choice of one from among the following:

NURS 687	Nursing Science: Research Application	3
NURS 868	Scholarly Project	3
NURS 869	Master's Thesis	6

#### CLINICAL NURSE SPECIALIST

##### Additional Course 12 credits

NURS 686	Clinical Nurse Specialist Role Integration	4
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(\*PSYC 829 Advanced Psychopathology, EDUC 813 Childhood Psychopathology or another approved graduate psychopathology course required for Psychiatric CNS instead of NURS 621)

#### Required Courses For Each Specialty:

##### Adult Health

NURS 636	Adult Health I	4
NURS 646	Adult Health II	4

##### Nursing of Children

NURS 654	Nursing of Children I	4
NURS 655	Nursing of Children II	4

##### Psychiatric Nursing

NURS 671	Psychiatric Mental Health Nursing I	4
NURS 672	Psychiatric Mental Health Nursing II	4

TOTAL CREDITS REQUIRED	34
FAMILY NURSE PRACTITIONER 46 Credits	
Additional Courses	30
NURS 616 Primary Care in Community Health	3
NURS 623 Management of Women's Health Care	3
NURS 624 Management of Children's Health	3
NURS 641 Primary Care of the Adult I	3
NURS 642 Primary Care of the Adult II	3
NURS 643 Primary Care of the Adult III	3
NURS 644 Nurse Practitioner Preceptorship	3
NURS 645 Nurse Practitioner Preceptorship	3

TOTAL CREDITS NEEDED 46

ADULT NURSE PRACTITIONER 43 Credits	
Additional Courses	27
NURS 616 Primary Care in Community Health	3
NURS 623 Management of Women's Health Care	3
NURS 641 Primary Care of the Adult I	3
NURS 642 Primary Care of the Adult II	3
NURS 643 Primary Care of the Adult III	3
NURS 644 Nurse Practitioner Preceptorship	3
NURS 645 Nurse Practitioner Preceptorship	3

TOTAL CREDITS NEEDED 43

NEONATAL NURSE PRACTITIONER 37 credits	
Additional Courses	24
NURS 616 Primary Care in Community Health	3
NURS 621 Advanced Pathophysiology	3
NURS 622 Advanced Pharmacology	3

Courses from Thomas Jefferson University	
TJU - NUR 662 NNP Clinical Course I	3
TJU - NUR 663 NNP Clinical Course II	3
TJU - NUR 664 NNP Clinical Course III	3
TJU - NUR 665 Comprehensive Assessment for Clinical Decision Making	3
TJU - NUR 666 Advanced Pharmacotherapeutics for the NNP	3

TOTAL CREDITS NEEDED 37

HEALTH SERVICES ADMINISTRATION 37 credits  
Core Courses (13 credits: NURS 604, NURS 609, NURS 668, EDUC 665)

NURS 619 Financial Management in Health Services Organizations	3
NURS 635 Health Administration Theories	3
NURS 637 Health Planning Strategies	3
NURS 638 Health Services Evaluation	3
NURS 664 Health Services Administration Practicum	3
NURS 690 Colloquium	0
UAPP and COMM Selected courses	6
TOTAL CREDITS NEEDED	37

### Post Master's Certificate Option

Post Master's Certificate programs are available in all concentrations. The Post Master's Certificate option is designed to provide individuals who already hold a Master of Science in Nursing degree with the core courses and clinical experiences necessary for eligibility for advanced certification. The number of credits varies with the area of specialty and the student's past academic record. Students must complete all course requirements within five years of matriculation into the Post Master's program.

### Application Process For Post Master's Certificate Programs

To apply to the post-master's certificate programs, applicants must submit an application and an official transcript of undergraduate and master's degrees to the University of Delaware. An interview with faculty is also required.

### Course Requirements:

HEALTH SERVICES ADMINISTRATION 15 Credits	
NURS 619 Financial Management in Health Services Organizations	3
NURS 635 Health Administration Theories	3
NURS 637 Health Planning Strategies	3
NURS 638 Health Services Evaluation	3
NURS 664 Health Services Administration Practicum	3

### CLINICAL NURSE SPECIALIST 21 Credits

All tracks require:

NURS 620 Advanced Health Assessment	3
NURS 621 Advanced Pathophysiology*	3
NURS 686 Clinical Nurse Specialist Role Integration	4
NURS 622 Advanced Pharmacology	3

(\*PSYC 829 Advanced Psychopathology, EDUC 813 Childhood Psychopathology or another approved graduate psychopathology course required for Psychiatric Nursing Specialty instead of NURS 621.)

Required courses for each specialty:

Adult Health

NURS 636	Adult Health I	4
NURS 646	Adult Health II	4

Nursing of Children

NURS 654	Nursing of Children I	4
NURS 655	Nursing of Children II	4

Psychiatric Nursing

(In addition to core requirements: Total of 18 credits of psychiatric/mental health course work are required to sit for the certification examination)

NURS 671	Psychiatric Mental Health Nursing I	4
NURS 672	Psychiatric Mental Health Nursing II	4

Choose two of the following:

PSYC 612	Human Psychophysiology	3
IFST 684	Theories of Counseling	3
IFST 690	Special Issues in Counseling Women	3

FAMILY NURSE PRACTITIONER 33 Credits

NURS 620	Advanced Health Assessment	3
NURS 616	Primary Care in Community Health	3
NURS 621	Advanced Pathophysiology	3
NURS 622	Advanced Pharmacology	3
NURS 623	Management of Women's Health Care	3
NURS 624	Management of Children's Health	3
NURS 641	Primary Care of the Adult I	3
NURS 642	Primary Care of the Adult II	3
NURS 643	Primary Care of the Adult III	3
NURS 644	Nurse Practitioner Preceptorship	3
NURS 645	Nurse Practitioner Preceptorship	3

ADULT NURSE PRACTITIONER 30 Credits

NURS 620	Advanced Health Assessment	3
NURS 616	Primary Care in Community Health	3
NURS 621	Advanced Pathophysiology	3
NURS 622	Advanced Pharmacology	3
NURS 623	Management of Women's Health Care	3
NURS 641	Primary Care of the Adult I	3
NURS 642	Primary Care of the Adult II	3
NURS 643	Primary Care of the Adult III	3
NURS 644	Nurse Practitioner Preceptorship	3
NURS 645	Nurse Practitioner Preceptorship	3

NEONATAL NURSE PRACTITIONER

24 credits

NURS 616	Primary Care in Community Health	3
NURS 621	Advanced Pathophysiology	3
NURS 622	Advanced Pharmacology	3
Courses from Thomas Jefferson University		
TJU - NUR 662	NNP Clinical Course I	3
TJU - NUR 663	NNP Clinical Course II	3
TJU - NUR 664	NNP Clinical Course III	3
TJU - NUR 665	Comprehensive Assessment for Clinical Decision Making	3
TJU - NUR 666	Advanced Pharmacotherapeutics for the NNP	3

**MASTER OF SCIENCE IN NURSING FOR THE REGISTERED NURSE (BSN/MSN)**

Telephone (302) 831-1255 <http://www.udel.edu/nursing/graduates/index.html>

Faculty Listing: <http://www.udel.edu/chs/facultystaff/index.html#nursing>

The School of Nursing offers a program to allow registered nurses an opportunity to earn a Master of Science in Nursing with specialization as a Clinical Nurse Specialist or a Nurse Practitioner, concurrently with a Bachelor of Science in Nursing. The number of credits for the BSN/CNS is 134 and for the BSN/NP is 143-146. Licensed registered nurses who are graduates of associate degree or diploma programs may apply for admission to this program.

- Official admission to the RN to MSN major.
- Successful completion of RN licensure exam (30 credits of nursing knowledge awarded) and current RN license.
- Submission of Nursing Employment Verification Form.
- Completion of 60 pre-requisite non-nursing credits (See BRN program information.)
- GPA of 3.0 or higher in all previous college work.
- Students are required to meet all immunization, safety, criminal background checks, drug screenings, and CPR requirements prior to clinical coursework and direct patient care. Additional requirements for the clinical education may be required by the healthcare agency to which a student is assigned. Students are expected to provide their own transportation to all required clinical experiences.
- 3 satisfactory academic and/or professional recommendations.
- Interview with faculty from graduate program.

**DUAL DEGREE: BACHELOR OF SCIENCE  
IN NURSING and MASTER OF SCIENCE IN  
NURSING**

Licensed RNS enter with 30 credits of nursing knowledge

**CURRICULUM CREDITS**

University Requirements

- ENGL 110 Critical Reading and Writing 3  
(minimum grade C-)
- Discovery Learning Experience (DLE) 3
- Multi-cultural Courses 3
- University Breadth Requirements 12
- Major Requirements

24 credits, to include a minimum of one course in each of the following five categories: (1) biology, (2) microbiology, (3) chemistry, (4) anatomy and physiology, and (5) nutrition 24 English course (second English composition course) 3

- Psychology course 3
- Sociology course 3
- Lifespan development course 3
- Restricted elective chosen from the following 3  
Art, Art History, History, Philosophy, Music, Theatre, Comparative Literature, Black American Studies, Economics, Political Science, Women's Studies, Foreign Languages and Literatures, Linguistics, and English.
- Core Courses for both the CNS and NP

Specialties

- NURS 335 BRN Orientation 1
- NURS 411/NURS 412/414

Topics in Health Care Delivery  
(Nursing Elective) 6

- NURS 435 Leadership and Management in Health Organizations 3
- NURS 442 Community Health Nursing 3
- NURS 604 Advanced Nursing Roles 3
- NURS 609 Nursing Science: Theory and Research 4
- NURS 620 Advanced Health Assessment 3
- NURS 621 Advanced Pathophysiology\* 3
- NURS 622 Advanced Pharmacology 3
- (\*PSYC 829 Advanced Psychopathology, EDUC 813)

Childhood Psychopathology or another approved graduate psychopathology course required for Psychiatric Clinical Nurse Specialist program.)

- EDUC 665 Elementary Statistics 3
- NURS 686 Clinical Nurse Specialist Role Integration 4

Three credits from among the following: 3

- NURS 668 Scholarly Project
- NURS 669 Master's Thesis
- NURS 687 Nursing Science: Research Application

Eight to Eleven credits from within one of following Clinical Nurse Specialization 6

Adult Health

- NURS 636 Adult Health I 4
- NURS 646 Adult Health II 4

Nursing of Children

- NURS 654 Nursing of Children I 4
- NURS 655 Nursing of Children II 4

Psychiatric Nursing

- NURS 671 Psychiatric Mental Health Nursing I 4
- NURS 672 Psychiatric Mental Health Nursing II 4

- PSYC829 Advanced Psychopathology 3

- or
- EDUC813 Childhood Psychopathology 3

- or
- Another approved graduate course

Nurse Practitioner Adult 3

- NURS616 Primary Care in Community Health 3

- NURS623 Management of Women's Health Care 3

- NURS641 Primary Care of the Adult I 3
- NURS642 Primary Care of the Adult II 3

- NURS643 Primary Care of the Adult III 3
- NURS644 NP Preceptorship I 3

- NURS645 NP Preceptorship II 3

Family  
All of Adult Nurse courses

- NURS624 Child's Health Care Health Services Administration 3

- NURS335 BRN Orientation 1
- NURS411/412/414

Topics in Health Care Delivery 3

- NURS442 Community Health Nursing 3
- NURS604 Advanced Practice Roles for Healthcare 3

- NURS609 Nursing Science: Theory and Practice 3

- NURS619 Financial Management in Health Services 3

- NURS350 Wellness and Health Assessment 3

- or
- NURS620 Advanced Health Assessment 3
- NURS312 Pathophysiology 4

or		
NURS621	Advanced Pathophysiology	3
NURS635	Health Administration Theories	3
NURS637	Health Planning Strategies	3
NURS638	Health Services Evaluation	3
NURS664	Nursing Practicum	3
NURS687	Nursing Science: Research Application	3

or		
NURS868	Research Project	3
EDUC665	Elementary Statistics	3
COMM610	Organizational Communication Theory	3

#### Electives

After required courses are completed, sufficient elective credits must be taken to meet the minimum credits required for the degree 15

Total Credits Required Clinical Nurse Specialist 134

Total Credits Required Adult Nurse Practitioner 143

Total Credits Required Family Nurse Practitioner 146

Total Credits Required Health Services Administration 137/138

### Doctor of Philosophy in Nursing Science

Telephone (302) 831-1255

<http://www.udel.edu/nursing/graduate.html>

Faculty Listing: <http://www.udel.edu/nursing/faculty/faculty.html>

e-mail: [ud-nursing@udel.edu](mailto:ud-nursing@udel.edu)

#### Program Overview

The School of Nursing PhD in Nursing Science program prepares researchers and academic faculty for positions in college, university, and health care settings. Graduates are prepared to advance the art and science of nursing and to assume leadership positions in the profession. They will take responsibility for shaping and advancing healthcare, with a goal of improving individual, family and population health through the integration of theory, research, and evidence-based practice. The PhD in Nursing Science program emphasizes specific areas of study in which nursing makes a significant contribution towards health. These areas are defined by the research expertise of faculty in the context of interdisciplinary resources available at the University of Delaware and Delaware Health Sciences Alliance campuses and the

local, national and international communities. Graduates are prepared to collaborate with other scientists and health professionals to contribute to the development of knowledge. The breadth of focus of the PhD in Nursing Science curriculum ranges from nursing research in the bio-behavioral sciences to health services.

#### Requirements for Admission

PhD in Nursing Science admission requirements originate at two levels: the University and the School of Nursing. The University-level requirements may be found in the Graduate Admissions section. Admission decisions will be made by the PhD Program Committee of the School of Nursing (SON). Students will be admitted to the program based on enrollment availability, identification of an appropriate and available committee advisor and their ability to meet the following minimum recommended entrance requirements:

- A baccalaureate in nursing degree from an accredited college/university (minimum GPA 3.0)
- A master's degree in nursing or other health related discipline, e.g. health care administration, from an accredited college/university (minimum GPA 3.5)
- A GRE score of 1050 on math and verbal sections combined; GRE scores must be earned within the last 5 years.
- Official results from the TOEFL or IELTS exam taken within the last 2 years (for non-native English speaking applicants only); it is required that all students in the program be proficient in both the verbal and written English language.
- A written statement of goals and objectives (the personal statement) that clearly identifies the applicant's research and curriculum interests and describes how admission to the program will facilitate his/her professional objectives. The statement should indicate how the applicant's research interest is consistent with the research expertise of a SON faculty member.
- Three letters of recommendation from an academic, employer and/or other professional sources who can address the scholarship potential of the applicant.
  - Active Registered Nurse (RN) license
  - A curriculum vitae or resume
  - Demonstrated competence in oral and written communication. A critical writing sample is required. This sample should demonstrate the student's ability to critique and synthesize the literature on a specific topic related to his/her dissertation area of interest.

Knowledge of statistics; completion of a statistics course in the past 5 years is strongly

## Graduate Certificate Programs

recommended

- An interview with the PhD program coordinator

Those applicants who meet the stated minimum academic requirements for admission are not guaranteed admission, nor are those applicants who fail to meet those minimum requirements necessarily precluded from admission if they offer other appropriate strengths.

### Financial Aid

Financial assistance for students in the PhD in Nursing Science program is obtained from a variety of external sources and will therefore vary in form and availability. Assistance will be awarded on a competitive basis to applicants best fitting the needs of the granting agencies and sponsoring faculty. Students receiving full stipends will be expected to work up to 20 hours per week on faculty projects, and are expected to maintain full-time status. Please refer to Graduate Fellowships and Assistantships for more information.

### Requirements for the Degree

The PhD in Nursing Science program requires 41 credit hours of coursework plus 9 credit hours of dissertation. Students are required to work with their advisor to develop a plan of study. The plan must first be approved by the academic advisor and then the PhD in Nursing Science Program Committee by the end of the first semester of study in the program. In addition to coursework, degree completion requires successful completion of one written and oral comprehensive examination, successful defense of the dissertation proposal and successful defense of the dissertation. Please refer to the program policy statement for more specific details regarding these processes and selection of examination and dissertation committees. Students are expected to complete the program in five years.

### Curriculum

Coursework will be specified in the student's plan of study and must include the following:

#### Core Courses (13 credits)

NURS810	Philosophical and Theoretical Basis of Nursing Sc	3
NURS833	Nurse Scientist: Special Topics Seminar I	1
NURS834	Nurse Scientist: Special Topics Seminar II	1
NURS835	Nurse Scientist: Special Topics	

	Seminar III	1
NURS841	Philosophical and Theoretical Basis of Nur. Ed.	3
NURS842	Nursing Higher Ed.: Structure, Process & Outcomes	3
NURS850	Dissertation Proposal Seminar	1

#### Research/Methods/Analysis Courses (16 credits): Statistics from EDUCATION, PSYCHOLOGY, SOCIOLOGY (6)

NURS812	Responsible Quantitative Research in Nursing Sc.	3
NURS814	Adv. Quantitative Research in Nursing Science	3
NURS816	Adv. Qualitative Research in Nursing Science	3

#### Research Methodology Course (3)

Course offered by other departments, relevant to student's research focus, determined with academic advisor and with approval of course faculty

#### Cognates (12 credits):

Electives taken to build substantive knowledge in area of dissertation topic. (12)

Electives are intended to enhance and broaden the student's scholarly involvement, build and inter-professional team of advisors, and build toward successful completion of the dissertation. Determined with academic advisor and with approval of course faculty

#### NURS964 Pre-Candidacy Study

Research and readings in preparation of dissertation topic and/or comprehensive examination for doctoral students before admission to candidacy but after completion of all required course work

NURS969	Doctoral Dissertation	9
UNIV999	Dissertation Sustaining (if needed)	0

## Graduate Certificate Programs

### Bioinformatics Certificate - Computational Sciences Concentration

### Graduate Certificate in Bioinformatics - Life Sciences Concentration

### Graduate Certificate in Biotechnology

### Geographic Information Science (GIS)

## Higher Education Teaching Certification (HETC)

The Higher Education Teaching Certification (HETC) program is offered by the Center for Teaching and Learning. The non-credit, optional program is open to all graduate students (at both the Masters and Doctoral levels) who intend to become future faculty. The pillars of the program are: research (on learning and teaching in higher education), application (of learning theory on concrete learning contexts), and reflection (on the effectiveness of teaching methodologies). Certification is awarded upon completion of all program aspects and is included in the participant's official transcript.

The program consists of a series of pedagogical and professional development modules in 4 content areas: Learning (UNIV600), Pedagogy (UNIV601), Faculty Roles (UNIV602), and Academic Job Search (UNIV603). By participating in the modules, students become familiar with current pedagogical practices and research, reflect on their teaching, observe exemplary instructors, and document their instructional skills and development via a teaching portfolio.

The program is offered in an online environment complemented by on-campus seminars. Content areas need not be taken sequentially; students may phase in and out of the program without penalty to best accommodate their schedule and/or professional needs. Applicants must have one semester of teaching experience (i.e., classroom instruction, studio teaching, discussion session facilitation, or laboratory instruction), and must include in their application a statement of support from a faculty member in their discipline. Graduate students apply for admission directly to the Center for Teaching and Learning.

Further information: <http://cte.udel.edu/programs/hetc/higher-education-teaching-certification-program.html>

## Legal Studies Graduate Certificate Program

The Graduate Certificate in Legal Studies is available to graduate students pursuing a Master's degree or Ph.D. degree at the University of Delaware. Legal Studies is a multidisciplinary social science discipline, with a core emphasis on "law and society." The importance of law means that various elements of the subject are covered in different academic departments and colleges at the University of Delaware. These include: Political Science and International

Relations, Linguistics, Economics, Sociology and Criminal Justice, Food and Resource Economics, the College of Earth, Ocean, and Environment, the Lerner College of Business and Economics, and the School of Urban and Policy Studies.

Students in disciplines that study law-related themes can add the Graduate Certificate in Legal Studies to their program of study, thereby providing objective evidence that they have this specific expertise and knowledge. Such students will receive their graduate degrees in the department in which they are enrolled, with a Graduate Certificate in Legal Studies awarded separately.

## Program Requirements

The program requires twelve credits of course work (normally, four courses) at the graduate level, plus attendance in the Legal Studies Faculty Research Seminar (or a substitute program of study approved by the Director) and a capstone research project. Two of the four courses must be outside of the student's graduate major. Two of the four courses must be "core" courses, one in the "law and society" area and one in general case law. The other two elective courses are selected from a list of approved legal studies courses (in addition to the core courses). Additional courses may be approved by the Director of Legal Studies.

The capstone research project may be a Master's or Ph.D. research project, and a member of the legal studies faculty should be on the committee. The capstone project also could be a research paper in an advanced graduate course that included a large research project. In all cases, the research project must be approved by the Director of Legal Studies.

Students also must take one semester of the pass-fail one-credit course Legal Studies Research Seminar (or a substitute program of study approved by the Director), which provides an overview of current research in the field of legal studies.

## Core Courses:

One "law and society" course from the following:

- SOCI 637 Law and Society in Historical Perspective
- SOCI 655 Law and Society
- SOCI 658 Social Science, Law and the Legal Process

One case-oriented "principles of the law" course

from the following:

POSC 605	Topics in Law and Courts
POSC 614	Judicial Process
POSC 805	Seminar: Public Law
MAST 673	International Law
MAST 674	Legal Aspects of the Coastal Zone
MAST 678	Coastal and Maritime Law
UAPP 646	Administrative Law

Elective Courses:

BUAD 840	Ethical Issues in Domestic and Global Business Environments
ECON 861	Industrial Organization and Antitrust Policies
EDUC 664	Legal Issues for School Managers
MAST 677	International Ocean and Environmental Policy
UAPP 839	Law for Administrators
UAPP 649	Civil Rights Law and Policy
IFST 688	The Law and Student Affairs

For more information about the Graduate Certificate in Legal Studies, contact: Sheldon D. Pollack, Director of the Legal Studies Program, or Maryanne Brown-MacKay, staff administrator, 219 McDowell Hall. Telephone: (302) 831-0367, or email: legal-studies@udel.edu, or check the website of the program at: [www.udel.edu/LegalStudies/gcp/](http://www.udel.edu/LegalStudies/gcp/).

### **Socially Responsible and Sustainable Apparel Business Certificate**

### **Computational Science and Engineering Certificate**

Admission to the Program

Application to the Certificate in Computational Science and Engineering program is submitted using the on-line graduate admission application that includes a statement of purpose, two letters of recommendation and transcripts from all previous college or university study.

Students currently matriculated in a graduate degree program should complete a "Change of Classification Form" to seek approval to add the Certificate in Computational Science and Engineering Program.

Requirements

Students are required to have a Bachelor degree in the sciences or engineering and should have background in the following areas: (i) fluency in a programming language such as C, C++ or Fortran, etc.; (ii) linear algebra; (iii) differential equations; (iv) multidimensional calculus; (v)

undergraduate-level data structures. Non-mathematics students may be able to make up one of these areas via the background courses in mathematics listed below.

Students are required to choose an appropriate advisor associated with the certificate program, or have an appropriate advisor appointed by the Director of the Certificate Program, who will be the primary contact for questions. The student will develop a plan for the certificate with the advisor before the beginning of the second course. The Director of the Certificate Program will verify that the student has completed the requirements for the certificate and will approve the application for the certificate upon successful completion of the requirements.

A total of 15 credits from the list given in Table 1 are required for this post-baccalaureate certificate. The student is required take CISC 621 and one of the following: MATH 607, PHYS 660 or CHEG 827. The student must complete courses in three different departments from the list in Table. At least one course from the 800 level must be taken from this list; CHEG 827 does not satisfy this requirement.

A student with sufficient background may waive up to six credits of the required courses above. No credits may be transferred from another University or degree program toward this certificate.

Students may earn up to three credits as 866 Special Problems if approved by the advisor instead of one of the nine credits after the required core courses above. The advisor will grade the 866 course if the work is done as part of employment outside the university.

Satisfactory Progress

Students in the Certificate in Computational Science and Engineering program must achieve a grade of B- or better to obtain credit for a course toward the certificate. Students must obtain at least a 3.0 cumulative grade point average in the courses from the list to obtain the certificate.

Chemical Engineering (CHEG)

CHEG 827\*

CHEG 831

CHEG 841

Civil and Environmental Engineering (CIEG)

CIEG 601

CIEG 605

CIEG 801

Computer and Information Sciences (CISC)

CISC 601

CISC 603

CISC 604

CISC 621\*

CISC 636

CISC 637

CISC 649

CISC 675

CISC 681

CISC 683

CISC 841

CISC 849

CISC 879†

CISC 886

CISC 887

CISC 889

Electrical and Computer Engineering (ELEG/  
CPEG)

CPEG 655

ELEG 841

Mathematical Sciences (MATH)

MATH 503

MATH 529

MATH 535

MATH 607\*

MATH 611

MATH 612

MATH 694

MATH 838

Mechanical Engineering (MEEG)

MEEG 867†

Physics and Astronomy (PHYS)

PHYS 650

PHYS 660\*

**Graduate Certificate in Leadership in Early  
Childhood and Human Services**

**Graduate Certificate in Parent Education and  
Family Support**

**Graduate Certificate in Statistics**

**Graduate Cognitive Science Certificate Program**

The courses for the Certificate in Computational Science and Engineering program. \*Courses from which the required courses must be selected. \*\*Credit for one of these 500 level background courses can be applied to the certificate requirements for students not in a degree program in the Department of Mathematical Sciences. †These topics courses may have multiple descriptions and subjects.

Using credits elsewhere

Credits may be applied to a degree program at the discretion of the Department housing the degree program. We expect that, at a minimum, the majority of credits may be applied to a graduate degree program. This also applies to dual Bachelor/Master degrees.

**Graduate Certificate in Early Language and  
Literacy**

**Certificate in Historic Preservation**

