



COLLEGE OF ARTS AND SCIENCE

Graduate Programs

- Art (M.A., M.F.A.)
- Art Conservation (M.S., Ph.D.)
- Art History (M.A., Ph.D.)
- Biological Sciences (M.S., Ph.D.)
- Chemistry and Biochemistry (M.A., M.S., Ph.D.)
- Communication (M.A.)
- Computer and Information Sciences (M.S., Ph.D.)
- English (M.A., Ph.D.)
- Foreign Languages and Literatures (M.A.)
- Geography-Geography (M.A., M.S.) and Climatology (Ph.D.)
- Geology (M.S., Ph.D.)
- History (M.A., Ph.D.)
- UD-Hagley Program and History of American Civilization
- Liberal Studies (M.A.)
- Linguistics (M.A., Ph.D.)
- Mathematical Sciences (M.S., Ph.D.)
- Museum Studies
- Music (M.M.)
- Neuroscience (Ph.D.)
- Physical Therapy (M.P.T.)
- Physics and Astronomy (M.A., M.S., Ph.D.) and the Bartol Research Institute
- Political Science and International Relations (M.A., Ph.D.)
- Psychology (M.A., Ph.D.)
- Sociology and Criminal Justice (M.A., Ph.D.)
- Theatre (M.F.A.)
- Winterthur Program in Early American Culture (M.A.)

The College of Arts and Science offers a number of Master's and Ph.D. 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 will be found in the faculty lists for individual departments.

ART

Telephone: (302) 831-2244

PROGRAM OVERVIEW

The Department of Art offers individually planned programs leading to the Master of Fine Arts and the Master of Arts degrees. A program with studio concentrations is available to outstanding candidates in the areas of ceramics, painting, photography, printmaking, and sculpture. The M.F.A. program is offered to students preparing for professional careers in a studio field. The expectation is for students to attend full-time over a two year period. Application requires presentation of a comprehensive portfolio in addition to general admission

procedures. 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 ADMISSION

Applicants should send the completed application, transcripts, and application fee to the Office of Graduate Studies. In addition, they should send a resume, statement, three letters of recommendation, and 15 to 20 slides of their most recent work to the Department of Art, Graduate Admissions Committee, University of Delaware, 104 Recitation Hall, Newark, DE 19716. Plastic slide sleeves are encouraged. (Include a self-addressed, stamped envelope in which to return the slides.) The department's application deadline is February 15 with decisions regarding admission generally made by March 15. In order for applicants to be considered for competitive fellowships and scholarships, application materials must be received by February 1. See also the chapter Graduate Admissions in this catalog.

FINANCIAL AID

Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog.

REQUIREMENTS FOR THE DEGREES

A minimum of 30 credits in an approved program of study, a public exhibition and a thesis are required for the M.A. degree.

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

Requirements	Credit Hours
Art Concentration (max. 36 credits).....	24 (minimum)
Cognate	9
Free Electives	9
Studio Electives	6
Graduate Seminar in Art	6
M.F.A. Supporting Paper	3
M.F.A. Exhibition	3
TOTAL.....	60

In some instances, the Department's Graduate Admissions Committee may establish additional requirements to be met by the individual student. Near the conclusion of 24-30 credit hours of graduate study, the M.F.A. candidate's progress will be reviewed by a committee to recommend any course adjustments it deems appropriate.

ART CONSERVATION

Telephone: (302) 831-3489

THE WINTERTHUR/UNIVERSITY OF DELAWARE M.S. PROGRAM IN ART CONSERVATION

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, and art and artifact technology, craft skills, cultural context, preventive maintenance, treatment techniques and conservation history, ethics and philosophy. Major conservation specialty areas include: textiles, wood, paper, photographs, library materials, paintings, 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. Specific course requirements are available from the department office. The fellowships are awarded annually. A full grant covers tuition for each semester and carries an annual stipend of \$7,000 for the first year, \$8,000 for the second year, and \$9,000 for the third year. Applications to the program must be filed by February 1. 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. Prospective applicants must contact the Art Conservation department for application materials.

REQUIREMENTS FOR THE M.S. 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 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 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 Early American 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.

THE PH.D. PROGRAM IN ART CONSERVATION RESEARCH

Note: The Ph.D. Program in Art Conservation Research is not currently accepting applications for graduate study.

The Ph.D. program in Art Conservation Research is designed for practicing conservators and conservation scientists who are interested in the scholarly investigation of problems in the conservation field. The program provides formal training in research methodology and advanced studies in the relevant sciences and humanities disciplines. A plan of study is individually designed for each student within the framework of University and departmental requirements.

REQUIREMENTS FOR ADMISSION

Admissions requirements include a master's degree with a strong background in art history, or anthropology, and in chemistry or another science; a working familiarity with problems in the field of art conservation; and submission of GRE scores, three letters of recommendation, a writing sample, and a plan of study (including a statement of objectives, an outline of projected course work, and a general indication of a dissertation topic). All students are expected to have upon enrollment, or to gain at the earliest possible moment, a reading ability in two foreign languages.

REQUIREMENTS FOR THE PH.D. DEGREE

Eight graduate-level courses (excluding any language courses necessary) are required and are to be divided between the humanities discipline and the science discipline related to the dissertation research. Dissertations may focus on studies of the deterioration of works of art, conservation materials or methods, or technical analyses for provenance or authenticity purposes. Written and oral qualifying

examinations must be passed, as well as a final dissertation defense. The program is to be completed within five years, including a minimum of one year in residence.

Some fellowship support is available in honor of Dr. Paul Coremans, founder of the Institut Royal du Patrimoine Artistique in Belgium and facilitator of the type of interdisciplinary research in conservation expected of students in the Ph.D. program.

ART HISTORY

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

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 strength on the graduate level 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. 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 slide collection, the Decimal Index of the Art of the Netherlands, the "Illustrated Bartsch," the Wayne Andrews photographic archive of American architecture, a cumulative index of dissertations and theses in American art, and a photographic Index of American Sculpture. 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 M.A. 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 Human Resources, Education and Public Policy, CHAD is cosponsored by the departments of Art History, History, and Geography, the College of Engineering, and the Museum Studies Program, American 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 Winterthur Museum Library, open to graduate students in art history, is especially strong in American art and in sources of design and both social history and British artistic backgrounds. 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 Studies by January 15. Students requesting fellowships or assistantships beginning in the fall semester must have their completed applications in the Office of Graduate Studies prior to January 15. See also the chapter "Graduate Admissions" in this catalog.

Admission to the graduate program in Art History is an academic judgment matter. Students are admitted 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 the chapter "Graduate Fellowships and Assistantships" in this catalog.

REQUIREMENTS FOR THE DEGREES

Requirements for the Master of Arts degree consist of a minimum of 24 hours of course work, a master's thesis (research essay), and a language examination (either French, German, or Italian). Individual programs will be arranged according to each student's needs in consultation with a faculty adviser. With the adviser's consent, students may substitute a limited number of courses in such related fields as anthropology, American studies, history, literature, urban affairs, and philosophy. Normally, the degree requirements may be completed in two years of full-time study.

Students will normally complete the M.A. degree before applying for candidacy to the Ph.D. program. Students who are accepted with an M.A. degree from an accredited art history program may enter the Ph.D. program directly. One major field and one minor field, in which students will be examined after completing 24 hours of course work, will be chosen from the following areas: Ancient, Medieval, Italian Renaissance, Northern Renaissance, Seventeenth and Eighteenth Century, Nineteenth and Twentieth Century, and American, with additional minors available in the History of Photography, Decorative Arts, Graphic Arts, History of Book Illumination, and History of Architecture. Upon petition, minor fields may be tailored to the student's special interests. Candidates for the Ph.D. must pass written examinations in German and either French or Italian. Candidates then produce a dissertation, which is defended in an oral examination.

RELATION TO THE M.A. IN EARLY AMERICAN CULTURE

At the University of Delaware, there are two avenues to the historical study of the visual arts: (1) The M.A. and Ph.D. program in the Department of Art History; and (2) the M.A. in Early American 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 Early American 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 Ph.D. level especially encouraged.

At the Ph.D. 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

Telephone: (302) 831-6977

Master of Science and Doctor of Philosophy degrees are offered in the fields of ecology, genetics and molecular biology, microbiology, neurobiology, and physiology-anatomy. Admission to the graduate program in biological sciences requires demonstrated academic excellence and the following (or the equivalent): three years of biological sciences (two years for students with undergraduate majors in other than the life sciences); one year of mathematics, preferably to include calculus and/or statistics; one year of college physics; one year of inorganic 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.

The Department of Biological Sciences has modern well-equipped laboratories for research and teaching in physiology, microbiology, the neurosciences, ecology, genetics, and developmental, organismic, cellular, and molecular biology. Facilities include electronic instrumentation, ultra-centrifuges, liquid scintillation and gamma spectrometers, fluorescent microscopes and spectrophotometers, constant temperature rooms and growth chambers, extensive animal research facilities, and scanning and transmission electron microscopes with attendant equipment. Computer facilities with access to mainframe sequence analysis and image analysis (IRIS and SUN workstations) are also available. In addition to Wolf Hall, the Department occupies much of the McKinly Laboratory Building.

REQUIREMENTS FOR ADMISSION

Admission to the Biological Sciences graduate program is competitive and based upon assessment of an applicant's overall strengths and aptitude to perform well in the chosen area of research interest. Applicants must meet the graduate admission requirements of the department, including a scholastic index of 2.8 overall and 3.0 in the sciences. Graduate Record Examination Aptitude and Advanced Biology Test scores are required. Competitive scores are approximately 550 (Verbal), 650 (Quantitative), 650 (Advanced Biology). Application is made to the University's Office of Graduate Studies. In addition, three letters of recommendation from persons able to judge the applicant's ability to pursue graduate study should be sent to the Chair, Department of Biological Sciences. See also the chapter in "Graduate Admissions" in this catalog.

FINANCIAL AID

Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog.

REQUIREMENTS FOR THE DEGREES

The Master of Science program requires 24 hours of courses, 6 hours of thesis and successful completion of the preliminary examination,

administered after the first year. Primary emphasis is on research that culminates in the thesis. A written research-based thesis and the oral defense of it are required.

For the Ph.D. degree, successful completion of the preliminary and qualifying examinations as well as the presentation and defense of a written research proposal and dissertation are required. The Ph.D. requires 30 credit hours including 9 hours of dissertation. The preliminary examination is administered after two semesters of study and is designed to identify the student's strengths and weaknesses and suitability for further graduate study. The qualifying examination is an in-depth examination of the student's research specialty and is administered after six semesters. Formal courses should be completed as soon as possible to allow time for independent study and research. Experience in the teaching of undergraduates is required of all candidates. It is expected that a significant portion of the dissertation will be suitable for publication.

CHEMISTRY AND BIOCHEMISTRY

Telephone: (302) 831-1247

The Department of Chemistry and Biochemistry offers programs leading to the Ph.D., M.S., and M.A. degrees. Financial support for Ph.D. 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 biology, engineering, mathematics, and physics 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 adviser. A reading knowledge of a modern foreign language is required for some areas for the Ph.D.

Three major facilities support the research of faculty and students. These laboratories are operated by Ph.D.-level scientists who provide analytical service and training courses. The Blue Hen NMR Complex houses five 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 six 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 and LC/MS instruments are available for routine student use. The X-ray laboratory includes two state-of-the-art diffractometers for small molecule crystallography. 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

Apart from the generally stated University requirements, all students are expected to fulfill a set of proficiency requirements upon entering the program. The M.A., M.S., and Ph.D. degrees require at least eighteen credits in graduate level courses (600-level or higher) excluding research and/or dissertation. At least nine coursework credits must be taken outside the student's area of concentration. Scientific courses at the 600-level or higher offered by other departments may be included in the coursework requirement if approved by the Chemistry and Biochemistry Department. The M.A. and Ph.D. degrees require successful completion of a series of cumulative examinations. The M.S. and Ph.D. degrees require a thesis based on original research. The M.S. degree requires a minimum of six and a maximum of twelve credit hours of thesis and/or research. The Ph.D. degree requires a final public oral defense of the dissertation. Some areas of concentration require successful completion of a Language Examination. Courses that are normally required for specific areas of concentration are as follows:

Analytical.....	CHEM 620, CHEM 621, CHEM 622, CHEM 623, CHEM 624, CHEM 625, CHEM 626, CHEM 627, CHEM 820
Biochemistry.....	CHEM 641, CHEM 642
Inorganic.....	CHEM 651, CHEM 652, CHEM 654
Organic.....	CHEM 633, CHEM 634, two additional courses with CHEM 63x or CHEM 83x designation.
Physical.....	CHEM 671, CHEM 672, CHEM 674, CHEM 677

Specific details of the requirements for the advanced degrees in chemistry may be obtained by requesting them directly from the Chemistry and Biochemistry Department.

COMMUNICATION

Telephone: (302) 831-8041

The Department of Communication offers a program leading to a Master of Arts degree in communication. A student may elect to pursue a general graduate communication degree or may specialize within one of the department's areas of study: organizational communication, mass communication, or interpersonal communication. The program is designed to produce competent consumers of empirical research and theory in preparation for Ph.D. studies or for a career as a communication specialist if this is a terminal degree. The program is not broadcast or production oriented.

REQUIREMENTS FOR ADMISSION

To be considered for admission, all applicants are evaluated on the following criteria: (1) undergraduate academic work; both total GPA and major GPA are considered (a 3.0 in both categories is the generally accepted minimum); (2) GRE scores; TOEFL scores; applicants must obtain a minimum score of 550 on each section of the GRE; foreign students must have a minimum score of 600 on the TOEFL; (3) three letters of recommendation; and (4) 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. 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

A limited number of teaching assistantships are available and are awarded competitively in the spring of each year. The application deadline is March 1. 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

The program necessitates that full-time students begin the course of study in the fall semester. Thirty credit hours are required to complete the degree. Five courses (15 credits) are required. Three courses (9 credits) are required of all students: COMM 601, Theory and Epistemology of Communication; COMM 603, Research Methods-Procedures; and COMM 604, Research Methods-Analysis. The two remaining required courses (6 credits) are selected from three theoretical courses: COMM 670, Theory of Mass Communication; COMM 630, Theory of Interpersonal Communication; and COMM 610, Theory of Organizational Communication. Finally, the Master of Arts candidate may write a thesis or take a comprehensive examination on all course work. The student who elects to write a thesis must take 6 credits of COMM 869, Master's Thesis. Graduate courses are offered in organizational communication, communication theory, mass communication, public relations, and interpersonal communication. There are also opportunities for independent study and/or internships. There are no language requirements. Six graduate credits may be taken outside the Communication Department in a related area, if approved by the graduate student's committee.

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

COMPUTER AND INFORMATION SCIENCES

Telephone: (302) 831-2712

The Department of Computer and Information Sciences offers programs leading to the Ph.D. and M.S. degrees. Computer Science is a vigorous and relatively new field for research and study. 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 areas include artificial intelligence (knowledge-based and expert systems, natural-language processing, robotics, multiagent systems, planning and problem solving), computational theory (computational learning theory, design and analysis of algorithms, recursive function theory), compiler optimization and compilation for parallel machines, networks and parallel computing (distributed computing, formal protocol specification, local area networks, algorithm and architecture design for massive parallelism, networks management, performance modeling, simulation), graphics and image processing, rehabilitation engineering (augmentative communication, speech recognition and enhancement), software engineering (real-time software design), and symbolic mathematical computation (algebraic algorithms, parallelization, rewrite systems).

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 M.S. and Ph.D. programs is that the Ph.D. is designed to prepare students to conduct advanced research.

The primary goal of the graduate program is to train people to think within the rapidly changing discipline of computer and information sciences. Of course, achieving this primary goal necessitates achieving the secondary goals of conveying skills and knowledge useful in the discipline.

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:

1. The equivalent of a bachelor's degree at the University of Delaware. A minimum grade average of 3.0 in the major field of study and an overall cumulative index of 2.5 is required.
2. 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,
 - assembly language programming,
 - data structures,
 - computer architecture.
 - operating systems.

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.
3. Strong applicants lacking prerequisites may be 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.
 4. A minimum combined score of 1750 on the verbal, quantitative, and analytical parts of the Graduate Record Examination Aptitude Test.
 5. 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.
 6. For applicants whose first language is not English, and who have not received a degree at a U.S. college or university, a minimum TOEFL score of 550 for admission without financial aid is required by the University. For applicants who seek a teaching assistantship appointment, a TOEFL score of 600 is required. In addition, for applicants who have not graduated from an institution whose principle language of instruction is English, the Test of Spoken English is highly recommended.
 7. Three letters of recommendation from professors (preferably), employers, or others who are able to assess your potential for success in graduate studies.

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 M.S. degree, or up to five years for the Ph.D. 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 Ph.D. preliminary examination after no more than three semesters of study. Students entering with an M.S. degree in Computer and Information Sciences (or a related area) are expected to take and pass the Ph.D. 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 length of support. With regard to financial aid, Ph.D. 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 MASTER OF SCIENCE 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 Studies.

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 Ph.D. 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 — Core Areas:

- Hardware Systems
 - Computer Architecture (CISC 662)
 - Operating Systems (CISC 663)
 - Computer Networks (CISC 650)
 - Software Systems
 - Programming Languages (CISC 670)
 - Theory of Translators (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 core courses, including at least one in each of the three areas.
 3. A grade of B- or better is required in any four of the core courses taken.
 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 CISC 869, which are included in the thirty credits needed for the M.S. 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 write an M.S. thesis.

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 M.S. thesis **only if** the areas of study do not overlap, as approved by the CISC Graduate Committee. The M.S. thesis student must still satisfy all other Department requirements.

REQUIREMENTS FOR THE PH.D. 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 Ph.D. is an individualistic degree. As soon as possible in the program, each candidate should find a faculty member to act as adviser 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. Department General Requirements

The Department requires the following:

1. **Course Work.** Each candidate must complete all requirements of a University of Delaware M.S. 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 CISC 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 M.S. degree, and show the equivalent of the 30 credit M.S. degree offered by the CISC Department.
Each candidate is required to complete a major and minor field of study based on a minimum of 12 additional credits beyond the master's degree. These 12 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 and a minor area, a candidate will be required by the adviser to complete more than 12 credits.
2. **Research Ability.** Ph.D. 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 M.S. 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 CISC undergraduate major and in one year of full-time graduate study including the core areas of the M.S. program. The detailed composition of the preliminary exam, within the constraint of testing breadth of CISC 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 coming in with a Bachelor's degree should normally take it 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 three times.
4. **Advisory Committee.** Each candidate 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 CISC Department faculty. The committee chair is the faculty member in charge of the candidate's research and dissertation. At least two members represent the major field of study and one the area of minor study. At least one member must be from outside the CISC Department. The proposed advisory committee must be submitted to the Graduate Committee for approval. It must then be approved by the CISC 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 major area, minor area, and 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, research interests, and major and minor areas of study. The proposal and plan are submitted to the advisory committee and are considered as input to the qualifying examination. Copies of "Discussion on Ph.D. 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 Ph.D. 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.

ENGLISH

Telephone: (302) 831-2363

The Department of English offers programs leading to the M.A. (with concentrations in Literature and in Literature and Pedagogy) and the Ph.D. There is also a certificate program in Business and Technical Writing.

REQUIREMENTS FOR ADMISSION

An applicant for the M.A. 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 Quantitative tests and **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 Ph.D. program must first gain admission to the M.A. program. Students who distinguish themselves in the M.A. program are then given permission to enter the Ph.D. program.

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

The English Department recognizes the application deadlines of July 1 for the Fall semester and December 1 for the Spring semester, but the department encourages much earlier applications, especially for the Fall semester, and it requires a deadline of March 1 for anyone seeking a fellowship or teaching assistantship in the Fall semester. In recent years, during which the increasing number of applicants has made the competition for admission much more rigorous, most of the admissions for the Fall semester have been determined by April 15.

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

The Department of English funds students each year, reserving awards for first-year M.A. and Ph.D. students. Funded students are granted one of the following awards: a fellowship; a teaching, research, editorial, or administrative assistantship; an assistantship in the University Writing Center; or an internship in a university administrative office. 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. Teaching assistants who serve as research, editorial, or administrative assistants and those who teach in the Writing Center work 15-20 hours per week each semester, as do those who serve as interns in other university offices. Fellows have no teaching or other duties.

REQUIREMENTS FOR THE DEGREES

The M.A. in Literature is granted upon the completion of eight semester courses (24 credit hours), a demonstration of ability to work in a foreign language, and the writing of a thesis (ENGL 869, 6 credit hours). In lieu of a thesis, the candidate for the M.A. may complete two additional courses (6 credit hours), ordinarily at the 800 level.

For the M.A. in Literature and Pedagogy, students may elect up to half of their course work in pedagogy and may satisfy their language requirement by taking an additional course in the history of the English language. Candidates seeking state certification must also take student teaching.

The Certificate Program in Business and Technical Writing requires five courses in the Department and two electives to prepare participants for careers in a number of professional writing specialties.

The Ph.D. is granted when the following requirements have been met: (1) completing at least eight courses (24 credit hours) beyond those taken for the M.A.; (2) satisfying the residency requirement of full-time study in two consecutive semesters; (3) demonstrating an ability to work in a second foreign language or advanced ability in one foreign language; (4) passing oral Ph.D. Comprehensive Examinations; (5) passing an oral Ph.D. Qualifying Examination in an area of specialization; (6) writing a dissertation; (7) passing an oral examination on the dissertation and related topics.

FOREIGN LANGUAGES AND LITERATURES

Telephone: (302) 831-2591/2592

The department offers two Master of Arts programs, the M.A. in Foreign Languages and Literatures and the M.A. 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. Secondary school teachers can participate in the Summer Institute for Foreign Language Teachers.

M.A. 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:

- 1) B.A. or equivalent in the target language/literature, or in another appropriate discipline.
- 2) Undergraduate Grade Point Average of 2.75 overall, and 3.25 in the proposed M.A. major subject.
- 3) GRE General Test for all students.
- 4) TOEFL for international students (550 minimum for admission to the program; 600 minimum for teaching assistantship).
- 5) Three letters of recommendation.

Admission to the M.A. 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 language and literature.

Candidates must pass a written and oral comprehensive examination based on reading lists in the major literature, as well as a reading competency examination in a second foreign language.

M.A. 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.

Requirements for Admission

The requirements for admission are:

- 1) B.A. or equivalent in the target language/literature, or in another appropriate discipline.
- 2) Undergraduate Grade Point Average of 2.75 overall, and 3.25 in the proposed M.A. major subject.
- 3) GRE General Test for all students.
- 4) TOEFL for international students (550 minimum for admission to the program; 600 minimum for teaching assistantship).
- 5) A letter of application written in the foreign language.
- 6) An interview with at least one member of the Foreign Language Education Committee or delegate conducted at least partially in the target language.
- 7) Three letters of recommendation.

Admission to the M.A. 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.

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 March 1, as the initial round of funding decisions will be made in mid-March. Students who miss the March 1 deadline may still be considered for any teaching assistantships or graduate scholarships not assigned in March.

Requirements for the Degree

Option I

Course work consists of 30 credits, including at least 15 in the major language (French, German, Spanish) and 9 in foreign language pedagogy; the remaining 6 credits, chosen with the consent of the adviser, can be in these or closely related fields.

Candidates must pass a written and oral comprehensive examination based on reading lists in the major literature and in foreign language pedagogy, as well as a reading competency examination in a second foreign language.

Option II (For In-Service Teachers Only)

This option is available only to current in-service teachers enrolled in the Summer Institute for Foreign Language Teachers.

Course work consists of 30 credits, including at least 9 in the major literature and 9 in foreign language pedagogy. At least six credits must be taken during the regular academic year.

Candidates must pass oral and written examinations emphasizing the theoretical and practical aspects of teaching language and literature (one section of both oral and written exams will be in the target language; the literary portion will be based on the year's Advanced Placement reading list), and achieve a rating of at least Intermediate High on the ACTFL OPI or the SOPI. Students must also present a portfolio of their work.

FINANCIAL AID

The Department of Foreign Languages and Literatures has two principal types of awards: teaching assistantships and graduate scholarships. Graduate Scholars teach six hours per week. Teaching Assistants may be assigned to the classroom (6 classroom hours per week), the Media Center (16-20 hours per week) or to individual faculty to serve as research or administrative assistants (16-20 hours per week). Graduate students who teach are assigned as team-teachers of elementary or intermediate foreign language courses. Experienced instructors take the MWF portion of the 5 day-a-week course, while graduate students are responsible for the TR portion.

STUDY ABROAD OPPORTUNITIES

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

SUMMER INSTITUTE FOR FOREIGN LANGUAGE TEACHERS

The Summer Institute for Foreign Language Teachers offers teachers of French and Spanish an opportunity to renew their speaking and writing skills in the language they teach, deepen their appreciation of the cultural content of foreign languages, and sharpen their pedagogical tools. Except for the pedagogy course (which comprises all modern languages), all instruction and classroom activities are conducted in the target language.

While it is not necessary to do so, some participants choose to pursue one of the department's M.A. programs, earning as many as 9 credits per summer towards their degrees.

GEOGRAPHY

Telephone: (302) 831-2294

The department offers programs leading to the Master of Arts and Master of Science degrees in geography and the Ph.D. degree in climatology. The graduate program provides the opportunity for students to interact frequently with a staff whose interests touch upon one of two particular themes: climatology, and human geography.

The climatology program emphasizes physical, synoptic, dynamic, and water budget climatology, as well as glaciology and climatic geomorphology. Climate research is directed toward solving numerous human and environmental problems.

The human geography program covers a broad range of themes approached from cultural-historical, socio-economic and humanistic perspectives. The study of landscapes, geographic ideas, perceptions and attitudes in a cross-cultural context (including philosophic and literary aspects) is another area of the program. Interdisciplinary work with other departments and the colleges of Agriculture and Natural Resources and Marine Studies is encouraged.

A University Center for Climatic Research has been established in the department, which also houses the Office of the State Climatologist for Delaware. Facilities include laboratories for cartography, climatology, and computer analysis. Graduate students have ready access to the University's Unix cluster with a variety of high-end machines. Departmental facilities include a smaller Unix cluster based on an SGI Challenge, Sparc stations, X terminals and PCs. Locally supported software includes: ArcInfo and ArcView GIS, and the McIDAS/Gempak weather analysis system. All of the department's computing facilities are fully integrated into the campus and worldwide networks. The department also is well-equipped with instrumentation for microclimatic studies and possesses an abundance of digitally-stored weather and climate data, principally for large scale investigations.

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.

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 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 PH.D. DEGREE

Applicants to the Ph.D. program in climatology are expected to have completed a master's degree in geography-climatology, meteorology, or a related discipline. Students in this program must also have completed mathematics through ordinary differential equations

(MATH 302) and must demonstrate a knowledge of at least one higher level computer programming language. Ph.D. students are expected to obtain an in-depth knowledge of two areas. One of these must be topical, such as bioclimatology, physical climatology or urban climatology, and the other must be methodological such as statistical methods, mathematics or computer science.

Students are also expected to have a broad knowledge of climatology and to demonstrate a high level of professional competence by passing a written qualifying examination, an oral examination and an oral dissertation defense. A description of the Ph.D. program in climatology can be obtained by contacting the Geography Department.

GEOLOGY

Telephone: (302) 831-2569 or 831-8750

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. The Department of Geology offers both field-oriented and laboratory-oriented research programs that take advantage of the University's geographic proximity to Appalachian, Atlantic Coastal Plain, and coastal terrains. Major research emphasis is Quaternary Geology.

The Department of Geology has cooperative programs with several nearby institutions, including the Delaware Geological Survey, U.S. National Museum, and Lamont-Doherty Earth Observatory. Departmental research is frequently carried out in cooperation with other departments and with the College of Marine Studies, which has a marine field station in Lewes, Delaware, and a seagoing oceanographic research vessel, *Cape Henlopen*.

The department owns a scanning electron microscope with attached x-ray spectrometer, x-ray diffraction apparatus, paleomagnetic equipment, laser particle counter, stereo-zoom transfer scope facility, diverse computer capability including Sun Workstations, largescale digitizer, gas and liquid chromatographs, ground penetrating radar, multichannel seismic equipment, various coring and drilling equipment, laser theodolite surveying system, and has ready access to nearly all other commonly used tools of geological and geophysical research. The department has a stable graduate program with 20 to 25 graduate students. Recent graduates have found positions in environmental consulting firms, academic institutions, federal and state geological surveys, and petroleum and mining industries.

REQUIREMENTS FOR ADMISSION

Admission to the graduate program in the Department of Geology is evaluated on the basis of the applicant's GRE scores, undergraduate record, three letters of recommendation and research interests. Applicants should have a combined verbal and quantitative GRE score of at least 1050. A minimum TOEFL score of 600 is required for foreign applicants for whom English is not the first language. The Department will consider qualified applicants without a previous degree in geology, although additional preliminary work may be required. Admission to the graduate program in the Department of Geology 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.

REQUIREMENTS FOR THE DEGREES

Requirements for the Master of Science degree include 30 credits of graduate study (6 of which are thesis credits and 3 are one-credit

800-level courses), 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 7 one-credit 800-level courses), and the research, preparation, and defense of the dissertation. All course programs are 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 adviser and thesis or dissertation committee.

Because of the value of the teaching experience, Ph.D. candidates in geology must teach a course or laboratory section for at least one term.

HISTORY

Telephone: (302) 831-8226

The Department of History offers M.A. and Ph.D. programs in American history, European history, and the history of technology. In conjunction with these, it has special programs focusing on the history of industrialization and on American social and cultural history, and provides an opportunity for students to earn a certificate in Museum Studies. The Department offers more limited graduate study in Ancient, African, Asian, Latin American, and Middle Eastern history, as well as courses in history education.

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

THE UNIVERSITY OF DELAWARE-HAGLEY PROGRAM

Prospective students with interests in the history of technology, science, business, economy, society, or labor may apply for fellowships in the University of Delaware-Hagley Program. The program focuses on the history of industrialization especially in comparative perspectives. University of Delaware-Hagley fellows may specialize in American history, European history, or the history of science and technology.

HISTORY OF AMERICAN CIVILIZATION

The Department of History in cooperation with the Winterthur Museum sponsors a Ph.D. 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 M.A. or Ph.D. candidate from any of the History graduate programs may qualify for a certificate in Museum Studies upon satisfactory completion of 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 M.A. and Ph.D. levels are offered. **Plan A** (Terminal 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 a sample of their research writing. **Plan B** (M.A. leading to Ph.D. degree) and Ph.D.: 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 a sample of their research writing. These averages are only minima and do not guarantee admission. The History Department normally accepts applications for all History programs **for the fall semester only**. The deadline for application is January 31, but early application is strongly encouraged. Applicants must submit three letters of recommendation. Students considering graduate work in history at the University of Delaware should write to the department for its bulletin *Guidelines to Graduate Programs in History*.

REQUIREMENTS FOR THE DEGREES

Candidates for the M.A. 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, and 2 research and writing seminars or one research seminar and a 6-credit M.A. thesis. Additionally, the Graduate Studies Committee will review the record of each M.A. student after he or she has completed three full semesters (or 21 credits) of graduate study; on the basis of this review the committee will inform the student whether he or she is making satisfactory progress toward the M.A. degree.

The Ph.D. degree recognizes the candidate's command of specific fields of history as well as the ability to conceive and execute a Ph.D. dissertation. Doctoral students do most of their work independently, under the supervision of their dissertation directors and other faculty members. The following specific requirements must be met: 9 hours of formal course work other than independent study courses which must include two of the department's basic historiography courses; demonstration of reading competence in a foreign language (faculties in certain specialties require additional language or skill requirements); passage of major and minor field exams; a dissertation prospectus submitted to the Graduate Studies Committee no later than six months following the field exams; and an oral exam in a field related to the student's dissertation topic that will include a discussion of the dissertation prospectus. After the preceding requirements have been met, the candidate must finish a dissertation and defend it in an oral exam.

MASTER OF ARTS IN LIBERAL STUDIES

Telephone: (302) 831-6075

REQUIREMENTS FOR THE DEGREE

Students working for the M.A.L.S. degree must take two interdisciplinary core courses, choose a series of interdisciplinary electives designed specifically for the program, and complete either a master's thesis or a synthesis project. By advisement of the Director and with consent of the course instructor, M.A.L.S. students may enroll in regular graduate offerings in the participating departments.

Designed primarily for adult, vocationally established individuals, the M.A.L.S. degree offers interdisciplinary graduate education centered in the humanities. The M.A.L.S. 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 include an official transcript of previous undergraduate and graduate studies, three supporting letters from individuals who can discuss the applicant's strengths and capabilities, and a short essay of about three pages describing the applicant's intellectual interests and how the applicant thinks these can be developed in the M.A.L.S. 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. 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.

LINGUISTICS

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

The Department of Linguistics offers programs leading to M.A. and Ph.D. degrees in Linguistics. The M.A. in Linguistics is a flexible degree, allowing students to design programs of study in areas of theoretical linguistics, applied linguistics (including teaching English as a second language) and cognitive science. Areas for Ph.D. specialization include theoretical linguistics (especially syntax and phonology), applied linguistics and computational linguistics. The Department of Linguistics also administers the program in Cognitive Science.

REQUIREMENTS FOR ADMISSION

Students with a B.A./B.S. or M.A./M.S. 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 math combined is normally required; the analytical score is also considered), and official transcripts of all previous work. Foreign students whose native language is not English must also submit scores on the TOEFL, on which a minimum of 550 is normally required. For these foreign students, the TOEFL score will be considered as the verbal section of the GRE when the TOEFL score is higher. In all cases, however, scores on all sections of the GRE must be submitted. Foreign students whose native language is not English and who are awarded a teaching assistantship must meet the Graduate School requirement for performance on either the Speak Test or the Test of Spoken English (TSE). The TSE may be taken overseas at any TOEFL center. Students should consult the appropriate section of the catalog for details of this requirement.

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 Ph.D. 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.

REQUIREMENTS FOR THE MASTER'S DEGREE

For the M.A., students must satisfy the requirements of either Option 1 or Option 2. Option 1 requires completion of 30 credit hours and a grade of PASS on the same Qualifying Exam taken by Ph.D. students. Option 2 requires completion of 36 credit hours to be planned in consultation with the student's adviser and the Director of Graduate Studies. Both options require a) that at least 21 of the required credit hours be taken in the Linguistics Department and b) the completion of at least one 800-level seminar. Full details of all programs are available from the department's Director of Graduate Studies.

REQUIREMENTS FOR THE PH.D. DEGREE

Students are required to take 69 credits beyond the B.A./B.S.: 60 credits in courses proper and 9 in dissertation. Students entering with a credited M.A./M.S. in an appropriate area as determined by the department must take 39 credits: 30 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, either LING 696 Psycholinguistics, or LING 680 Sociolinguistics, 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 in theoretical and applied linguistics, 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. While there is no formal graduate degree in Cognitive Science, the Ph.D. 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.

MATHEMATICAL SCIENCES

Telephone: (302) 831-2653

The Department of Mathematical Sciences offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy in Applied Mathematics and in Mathematics.

Most of the major areas of mathematics are included among the research interests of the faculty of the department, but the areas most heavily represented are applied mathematics, partial differential equations, integral equations, inverse problems, complex function theory, discrete mathematics, topology, and probability.

Each of the graduate programs in the department is relatively small allowing for close contact between graduate students and faculty. Individual attention is common. There are several active seminars on research topics and there is steady additional stimulus from professional visits by scientists from the U.S. and abroad.

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 ORE Aptitude Test. The advanced test in mathematics is highly recommended.

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 guarantee financial aid for 10 semesters for students entering with a Bachelor's degree; those entering with a Master's degree can expect to receive financial aid for 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 Bachelor's degree must pass the Candidacy Exam by the beginning of his/her 6th semester (in February). 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 guaranteed 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 the following August, 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

Master's degree students must complete 30 hours of course work beyond the Bachelor's degree. Students must maintain a GPA of 3.0 or better.

Core requirements (18 credit hours): MATH 600, MATH 602, MATH 611, MATH 616, MATH 672, and MATH 807.

Electives (6 credit hours): to be approved by the Graduate Committee.

Additional Requirements (6 credits):

For the Applied Mathematics M.S.: MATH 617 and a one semester course in an area of application (ELEG 667, CHEG 830, CIEG 639, MEEG 630 or a course approved by the graduate committee).

For the Mathematics M.S.: MATH 650 and MATH 688.

REQUIREMENTS FOR THE PH.D. DEGREE

Students with no prior graduate course work must complete 54 credit hours of courses, plus an additional 9 credits of MATH 969 (Doctoral Dissertation). A maximum of 6 credit hours of research (MATH 868) is allowed to count as an elective in the 54 credit hour requirement. Of

the 54 hours, a maximum of 27 credit hours of 600-level courses in the mathematics department is allowed. All electives must be approved by the graduate committee. After completing their course requirements, students are expected to enroll for at least one course each semester (which may be as a listener) in addition to MATH 964 or MATH 969. A GPA of 3.0 or better must be maintained.

Students entering with a Bachelor's degree must pass the Preliminary Exam in order to continue beyond their second year (beyond the first year for those entering with a Master's degree). A second written exam, the Candidacy Exam, must be passed in order for a student to be admitted to Ph.D. candidacy.

Core Requirement (21 credits): All Applied Mathematics and Mathematics students must complete MATH 600, MATH 602, MATH 611, MATH 616, MATH 672, MATH 806, MATH 807.

Doctoral Dissertation (9 credits): MATH 969.

Additional requirements (33 credits):

For the Applied Mathematics Ph.D.: MATH 612, MATH 617, MATH 810, and two semesters in areas of application (ELEG 667, CHEG 830, CIEG 639, MEEG 630 or courses approved by the graduate committee) plus 18 credits of electives

For the Mathematics Ph.D.: MATH 650, MATH 688, MATH 827, and MATH 845 plus 21 credits of electives.

Other Requirements for the Ph.D.

Preliminary Exam: Offered before the beginning of each semester, this written examination covers material from MATH 600 and MATH 602 (Advanced calculus) and MATH 672 (Linear algebra). Students entering with Bachelor's degrees are required to pass the Preliminary Examination by the beginning of their 4th semester (by the beginning of their 2nd semester for students entering with Master's degrees). Students who do not meet this requirement are recommended for dismissal.

Candidacy Exam: This written examination is administered in February. A student entering with a Bachelor's degree must pass the Candidacy Exam by the beginning of his/her 6th semester of study (by the 4th semester of study for those entering with a Master's degree). A second and final attempt is permitted in the following August. 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 and Discrete Mathematics. The exams are based on MATH 650 and MATH 845 (Algebra), two chosen from MATH 805, MATH 806 and MATH 807 (Analysis), MATH 616, MATH 617 and MATH 810 (Applied Mathematics) and MATH 688 and MATH 689 (Discrete Mathematics). 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.

Language Requirement: The department requires the Ph.D. candidate to have reading knowledge of one of four languages: French, German, Italian or Russian. Substitutions may be allowed upon petition.

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.

MUSEUM STUDIES

Telephone: (302) 831-1251

The program offers courses in the history, philosophy and functions, leadership and management, curatorship, educational offerings, interpretive programs, exhibitions and public dimension of

institutions that collect, preserve, study, and disseminate information about our cultural heritage. A certificate in Museum Studies may be earned in conjunction with a graduate degree in history, art history, art, early American culture, public horticulture, business administration, liberal studies, and other fields appropriate for students planning careers in history, art, natural history, science and technology, and other kinds of museums. Students are admitted who are accepted for graduate work in joint programs of the University and the Hagley Museum, Longwood Gardens, and the Winterthur Museum, as well as students enrolled in associated University departments.

Students wishing to enroll in Museum Studies should apply for admission to the University Office of Graduate Studies indicating the graduate degree program of their choice.

MUSIC

Telephone: (302) 831-2577

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 two concentrations: Performance (emphasizing studio instruction or conducting, and culminating in a public recital) and Teaching (directed towards music educators in grades K-12 who desire a master's degree in this discipline).

RESEARCH FACILITIES

Music study is enriched by the well-equipped and modern facilities in the Amy E. du Pont Music Building, with its large rehearsal rooms, ample practice rooms and Loudis Recital Hall. 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 study scores and chamber music, as well as a fine collection of audio and video recordings. The building also houses extensive electronic equipment to support the work in computer and video-disc technology which has earned the department international acclaim.

REQUIREMENTS FOR ADMISSION

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 department's Committee on Graduate Studies, revealing an acceptable grade-point average (normally 3.0). Finally, the student must provide the Coordinator of Graduate Studies with a statement of professional goals and three letters of recommendation. Students applying for admission to the Performance Concentration must pass an audition.

Applicants must also perform satisfactorily on the department's music theory and music history placement tests prior to enrolling in MUSC 695 (Advanced Analytical Techniques) or MUSC 611 (Studies in Music History). Any and all deficiencies indicated must be corrected before the student may enroll in these courses. This may be accomplished through enrollment in one or more existing undergraduate music theory or literature courses or through a program of self-study, tutoring, or laboratory work. The department's Coordinator of Graduate Studies will prescribe remedial

action, if any, appropriate for each person. The student will be required to retake and pass the portions of the placement exams in which deficiencies were found before enrolling in the above-mentioned courses.

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's Coordinator of Graduate Studies for information. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREE

I. Performance Concentration

Courses

Students are required to complete 33 credit hours (maintaining a grade average of B or better) to be granted the degree Master of Music: Performance. All students take the following:

- MUSC 601 Master's Recital (2 cr.)
- MUSC 603 Chamber Music Literature (3 cr.)
- MUSC 611 Studies in Music History (3 cr.)
- MUSC 620 Large Ensemble (1 cr.)
- MUSC 621 Chamber Ensemble (1 cr.)
- MUSC 622 Materials and Methods of Research (3 cr.)
- MUSC 661 Advanced Private Study (4 cr.)
- MUSC 662 Advanced Private Study (4 cr.)
- MUSC 681 Pedagogy and Literature (3 cr.)
- MUSC 695 Advanced Analytical Techniques (3 cr.)

Students will elect one of the following:

- MUSC 605 Symphonic Literature (3 cr.)
- MUSC 663 Advanced Keyboard Literature (3 cr.)

There is one elective in the program, which may be taken from among Music Department offerings or elsewhere in the University with the approval of the student's advisor (3 cr.)

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. Teaching Concentration

Courses

Students are required to complete 30-31 credit hours (maintaining a grade 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 cr.)
- MUSC 622 Materials and Methods of Research (3 cr.)
- MUSC 695 Advanced Analytical Techniques (3 cr.)

Music Education Courses (6 cr.)

- MUSC 640 Philosophical Issues in Music Education (3)
- MUSC 676 Seminar in Music Education (3)

Specialization Component (3-4 credits)

Students can elect one of three areas of specialization: Choral Conducting, Instrumental Conducting, or General Music K-12. The courses for each are as follows:

Choral Conducting

- MUSC 636 Advanced Choral Conducting (3)
 MUSC 638 Large Ensemble Practicum (1)
 (Large Ensemble to be chosen with the approval of the faculty advisor)

OR**Instrumental Conducting**

- MUSC 637 Advanced Instrumental Conducting (3)
 MUSC 638 Large Ensemble Practicum (1)
 (Large Ensemble to be chosen with the approval of the faculty advisor)

OR**General Music K-12**

- MUSC 675 General Music K-12 (3)

Thesis or Project (6 credits)

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 Improvement Project I (3)
 MUSC 680 Professional Improvement 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.

NEUROSCIENCE

Telephone: (302) 831-3311

The Graduate Program in Neuroscience is an interdisciplinary program leading to the Ph.D. in a traditional academic discipline (Biological Sciences or Psychology) and in Neuroscience. Faculty who participate in the Neuroscience Program are from the Departments of Biological Sciences, Psychology, Physical Therapy, and Electrical and Computer Engineering. Research areas explored by these faculty range from molecular neuroscience to behavioral neuroscience. The goal of the program is to ensure that students are expert in their specialty in neuroscience as well as conversant with the broad range of multidisciplinary neuroscience.

In close apprenticeship relationships with research advisers and other faculty in the program, students are trained to master multidisciplinary techniques in order to address the current issues in neuroscience. The research of each student in the program is supervised by a committee that is chaired by the student's research adviser and includes faculty from the academic units that participate in the Neuroscience Program.

Neuroscientists at the pharmaceutical laboratories of The DuPont Company, DuPont-Merck, and AstraZeneca in Wilmington, Delaware, and at the U.S. government laboratories in Aberdeen, Maryland work closely with University faculty in the training of graduate students. Through these experiences, students are exposed to the research environments of industrial and governmental laboratories.

REQUIREMENTS FOR ADMISSION

Students with interest and background in the interdisciplinary aspects of neuroscience should apply to the University through one of the two participating academic units (Departments of Psychology or Biological Sciences). Students must meet the admission requirements of the academic unit to which they apply before they may be considered for admission to the Graduate Program in Neuroscience. Students are encouraged to consult with any of the participating faculty, or with the Director of the Neuroscience Program for additional information relating to the neurosciences. Students may also apply to the Program in Neuroscience after matriculation into one of the participating academic units.

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 must satisfy the degree requirements of the participating academic unit into which they have been accepted. In addition, to gain competence and breadth in the major areas of neuroscience, students must take four core courses in the neuroscience curriculum, one year of statistics, and pass a qualifying examination in neuroscience. The core courses in the program are neuroanatomy, cellular neurophysiology, neuropharmacology, and integrative neurophysiology.

PHYSICAL THERAPY

Telephone: (302) 831-8910

The Physical Therapy Department offers a Master of Physical Therapy (M.P.T.) degree program. This is an entry-level degree which will qualify the graduate to sit for the physical therapy licensure examination in any state in the country. The program is accredited by the Commission on Accreditation in Physical Therapy Education.

The Physical Therapy Department is housed in McKinly Laboratory and has modern well-equipped laboratories for research, teaching, and clinical practice. In addition, there is a physical therapy practice clinic which is staffed by students who are supervised by faculty members. All students are required to register for the practice clinic at least once during the degree program.

REQUIREMENTS FOR ADMISSION

The minimum requirements for the MPT program are:

- a bachelor's degree from an accredited institution
- documented volunteer or paid clinical experience in physical therapy (200 hours)
- three letters of recommendation
- Graduate Record Examination Verbal and Quantitative scores
- if requested, an interview with the admissions committee

Admission to the M.P.T. program requires demonstrated academic excellence, evidence of physical therapy clinical experience, and the following (or equivalent): two years of biological sciences, including physiology and anatomy; one year of inorganic chemistry; calculus; one year of physics; one year of psychology; one semester of English; and one semester of statistics. All course work must be completed prior to beginning the professional program.

Application is made to the University's Office of Graduate Studies. In addition, three letters of recommendation from persons

able to judge the applicant's ability to pursue physical therapy graduate study should be sent to the Chair of the Physical Therapy Department. Two of these letters should be from licensed physical therapists who have observed the applicant in a clinical environment. Application deadline is January 16.

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

The M.P.T. program requires 69 hours of graduate course work. These hours are in such areas as didactic instruction, experiential laboratories, research, clinical internships, or other equivalent academic experiences. Clinical internships comprise 15 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 years duration, including summers. Part-time matriculation is not typically permitted. A thesis option is available for students interested in pursuing research.

MASTER OF PHYSICAL THERAPY CURRICULUM

GRADUATE YEAR 1		CR
Summer		
PHYT 600	PT as a Profession	1
	(Second Summer Session)	
PHYT 622	Clinical Gross Anatomy	6
	(Second Summer Session)	
		7
Fall		
PHYT 801	Medical Science I	2
PHYT 604	Functional Anatomy	3
PHYT 602	Patient Management I	3
PHYT 603	Physical Agents	2
PHYT 624	Introduction to Evaluation Techniques	1
PHYT 606	Research	3
		14
Winter		
PHYT 605	Clinical Internship	3
Spring		
PHYT 601	Exercise Physiology	3
PHYT 623	Clinical Neuroscience	4
PHYT 607	Electrotherapy	3
PHYT 620	Educational Process in Community Health	1
		11
GRADUATE YEAR 2		CR
Summer		
PHYT 608	Musculoskeletal Evaluation	3
	(First Summer Session)	
PHYT 802	Medical Science II	2
	(First Summer Session)	
PHYT 605	Clinical Internship	3
	(Second Summer Session)	
		8
Fall		
PHYT 609	Neurophysiologic Evaluation	3
PHYT 611	Clinical Management	1
PHYT 617	Patient Management II	3

PHYT 618	Life Span Development	3
PHYT 803	Medical Science II	2
PHYT 610	Psychosocial Aspects	2
		14

Winter

PHYT 619	Advanced Seminar	2
		2

Optional Electives-Hours do not count towards total required hours for degree.

Maximum of two electives. (6)

Spring

PHYT 605	Clinical Internship	6
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Note: PHYT 621 Practice Clinic (1 cr) must be taken at least once during the degree program. 1

Summer

PHYT 605	Clinical Internship	3
	(First Summer Session)	

Total Hours **69**

Note: The curriculum is subject to modification as needed.

PHYSICS AND ASTRONOMY AND THE BARTOL RESEARCH INSTITUTE

Physics Telephone: (302) 831-2661 or 831-2662

Bartol Telephone: (302) 831-8111

The Department of Physics and Astronomy and the Bartol Research Institute offer joint graduate programs leading to the M.A., M.S., and Ph.D. degrees. The Department and Institute are located in Sharp Laboratory, which houses a physics library, research and teaching laboratories, a fully equipped and staffed machine shop, and electronics shop. Ample computing facilities are available, including access to the Internet and national supercomputing centers.

The Joint Graduate Program is well equipped for experimental research in condensed matter and materials physics, acoustics, atomic and molecular physics, and biophysics. Research facilities include a high pressure laboratory, electron microscopy and x-ray diffraction laboratories, specialized laser facilities, and a 2.3 MV Van de Graaff accelerator used for PIXE and other analytical studies of materials and thin films. In addition, numerous facilities are available for the preparation and study of structural, thermal, transport, optical, acoustic, and magnetic properties of solids and liquids.

Experimental and observational research opportunities in astronomy and astrophysics are available through the Joint Graduate Program. Space science research is supported through a number of in-situ NASA satellite experiments such as the Voyager Interstellar Mission, the Mars Global Surveyor (MGS), Advanced Composition Explorer (ACE), WIND spacecraft in The Global Geospace Project and SOHO (Solar and Heliospheric Observatory), as well as a program of high altitude balloon flights.

Research in observational astrophysics includes use of the NASA great observatories, the VLA radio telescope in New Mexico, and ground based and underground cosmic ray laboratories around the world. Bartol operates 2 neutron monitors, a millimeter telescope, a cosmic ray air shower experiment and a solar observatory in Antarctica. The Mt. Cuba Astronomical Observatory is associated with the University of Delaware and makes a 24-inch Cassegrain telescope available for observational research. The Bartol Research Institute leads a consortium of 9 regional institutions of higher learning which are part of the National Space Grant College Program.

Theoretical research is an essential part of the Joint Graduate Program. Opportunities are available in condensed matter and materials physics, particle physics, cosmology, atomic and molecular physics, astrophysics, space physics, plasma physics, and nuclear physics. Many of these theoretical activities involve a close working relationship with related experimental programs. Extensive numerical modeling is done both locally and at national supercomputing laboratories.

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. A minimum undergraduate grade point average of 3.2 or its equivalent is recommended for admission. In addition, scores for the Graduate Record Exam (GRE), Verbal, Quantitative and Analytic, and the GRE Physics Subject Test are required. A complete official transcript or equivalent certified written record of academic work to date is also essential. This should list the courses taken and the individual grades awarded. At least three letters of reference should be sent independently by professors or others who are familiar with the applicant's academic work. For students whose first language is not English, the Test of English as a Foreign Language (TOEFL) is required. For financial support, a TOEFL score exceeding 600 is required. Of the reference letters, at least one should be from someone familiar with graduate study in the U.S.A. and at least one should address the applicant's English speaking ability.

FINANCIAL AID

Financial aid is available to graduate students in the form of teaching assistantships, research fellowships, and University fellowships. Inquiry regarding these appointments may be made when applying for admission. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREES

The M.A. degree program requires 30 credit hours of graduate level formal course work, at least 24 of which are taken in PHYS. The course work will not be accomplished merely by accretion of scattered credits, but will be methodically planned in consultation with the student's faculty advisor. In appropriate circumstances a project entered under PHYS 868 could be submitted for as many as 3 of the credits of formal course work. Because it requires neither research nor a thesis, the M.A. degree can be completed more rapidly than the M.S. degree and may be the more suitable for students able to attend only on a part-time basis. But the M.A. degree is viewed as a terminal degree, and its recipients will not normally be considered for candidacy in the M.S. or Ph.D. programs in Physics.

Twenty-four credit hours of course work are required for the M.S. degree; at least 6 must be in 800-level courses in physics. In addition, 6 credit hours of thesis (PHYS 869) must be completed. Approval of the department review committee is required if more than 6 of these 24 are from departments other than physics or if any are in a discipline unrelated to physics. After the M.S. thesis is completed, the candidate defends the thesis in an oral examination administered by the thesis committee.

Prospective Ph.D. candidates are frequently chosen from among those who have successfully completed a master's degree program either at Delaware or elsewhere. However, a physics graduate student may bypass the M.S. degree by:

1. Taking and passing the preliminary and qualifying examinations within two years of entering graduate work (two and one-half years for students admitted in January), and
2. Taking and passing, with a grade of B (3.000) or better, 30 credits of course work within the first five semesters after entering graduate work. At least 21 of these credit hours must be from among PHYS 607/8, and 800-level physics courses.

A student entering the department with a master's degree must either:

1. Take at least 12 credit hours of course work during the first year, including 6 at the 800 level, and take the qualifying exam within one year, and pass it within two years;
- or
- 2) Satisfy the bypass option mentioned above.

All Ph.D. students must take a minimum of 12 credit hours of classroom course work beyond the core curriculum. These courses must be at or above the 600 level and be in physics or physics-related areas.

The preliminary exam based on several general physics texts is given twice a year in September and February. It must be taken by all students immediately after entry into the program and passed before the beginning of their second semester.

The qualifying examination, which is based on a core of graduate-level courses, is given twice per year, in late August and in early February. The Ph.D. candidate must pass this examination within three and a half years after arriving at Delaware. Most students take the examination for the first time at the end of their second year.

Upon successful completion of a research program, the candidate is required to pass a final oral examination that includes the defense of the dissertation and discussion of relevant material. Progress of a student through the graduate program is reviewed regularly by a departmental review committee.

The research content of the M.S. and Ph.D. program can be chosen from among current faculty research activities within astronomy, astrophysics, atomic and molecular physics, biophysics, condensed matter and materials physics, cosmic ray physics, nuclear and elementary particle physics, and solar and space physics. More detailed information on research areas and facilities is contained in a departmental brochure available upon request.

POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Telephone: (302) 831-2355

The Department of Political Science and International Relations offers three graduate degree programs: M.A. and Ph.D. in political science and M.A. in international relations. Political Science fields of specialization include American Politics and Institutions, Comparative Politics, International Politics, Law and Courts, Political Philosophy and Public Administration and Public Policy. The department also participates in the Master of Public Administration degree in conjunction with the College of Urban Affairs and Public Policy.

The master's program offers advanced study in political science for students interested in later pursuing Ph.D. studies, entering government service, or other careers.

The Ph.D. program provides opportunities for the development of research and teaching skills necessary for careers in education or public service.

REQUIREMENTS FOR ADMISSION

To be accepted into the program students are evaluated on several criteria.

For the Ph.D.:

- Performance on GRE aptitude test (normally 1700 for the 3 combined 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).

For the M.A.:

- Performance on GRE aptitude test (normally 1500-1600 for the 3 combined aptitude scores).
- Undergraduate grade-point averages (normally a 3.0 overall and 3.2 in major field).
- Three letters of recommendation.
- For international students, a TOEFL score (normally at least 600).

Utilizing all of these variables, the department attempts to predict the candidate's success (e.g., low GRE scores could be balanced by high grades and very strong recommendations). Applicants are encouraged to submit examples of written work.

In addition, admission to the graduate program is affected by the number of well-qualified applicants and the limits of available faculty. Those who meet stated minimum academic requirements are not guaranteed admission.

REQUIREMENTS FOR THE DEGREES

The program of study is divided into six fields: political theory, public policy and administration, comparative government, international relations, law and courts, and American government. Students may complete the M.A. degree through either a 1-year or 2-year program, and may complete the Ph.D. in four to five years. The relatively small size of both the M.A. and Ph.D. programs insures individualization of students' degree plans and encourages faculty-student cooperation in areas of special interest. Financial aid is available. Applicants are also eligible to compete for university-wide fellowships.

The M.A. in Political Science program requirements are the following: 30 credits of course work including POSC 800 Seminar: Philosophy of Political Inquiry; POSC 801 Research Design; seminars in three of the six fields offered by the department; and a comprehensive examination in one field. A research requirement may be met through an M.A. thesis (6 credit hours) or a major seminar research paper.

The M.A. in International Relations requires 30 credits of course work including POSC 800 Seminar: Philosophy of Political Inquiry, POSC 830 Seminar: International Relations, POSC 810 Seminar: Comparative Politics, POSC 840 International Political Economy, and one seminar selected from POSC 803 Public Administration, POSC 808 American Political Institutions, POSC 833 Normative Political Theory, POSC 838 Public Policy Analysis, or POSC 805 Seminar: Public Law, a comprehensive examination in international relations, and competency in one language in addition to English. A thesis (6 credits) is also required.

The Ph.D. program requires POSC 800 Seminar: Philosophy of Political Inquiry, POSC 801 Research Design, knowledge of one foreign language, competence in social science statistics, 60 credit hours (or an M.A. plus thirty additional credits), comprehensive examinations in three fields, and a Ph.D. dissertation.

PSYCHOLOGY

Telephone: (302) 831-2271

The Department of Psychology offers a doctoral degree program in psychology, with specialization in the areas of social psychology, cog-

nitive psychology, biological psychology, 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 research workers 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 information processing, child development, electrophysiology, pharmacological and physiological bases of animal behavior, psychophysiology, small group behavior, interpersonal communication, psycholinguistics and visual processing. 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, a complete photography set-up, and an electronics and carpentry shop. 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 the chapter "Graduate Fellowships and Assistantships" in this catalog 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. The Master's Degree is optional.

Successful completion of the second year project, the qualifying exam, and the dissertation proposal are necessary for admission to candidacy for the Ph.D. Progress toward the Ph.D. is achieved through completion of advanced work, dissertation research, and a clinical practicum and internship for students in the clinical area.

SOCIOLOGY AND CRIMINAL JUSTICE

Telephone: (302) 831-2581

The Department of Sociology and Criminal Justice offers a Master of Arts and a Doctor of Philosophy degree program in both sociology and criminology. Students may develop specializations in any of the following areas: social theory, research methods, urban sociology, sociology of sex and gender, sociology of law, organizations, and deviance. The graduate program is oriented toward providing students with professional training for a variety of academic and research careers in sociology or criminology. Career objectives may include employment in industry, governmental agencies, research, or college and university teaching.

RESEARCH CENTERS

The Department of Sociology and Criminal Justice sponsors two research centers. The Disaster Research Center conducts international and national studies of disasters and the Center for Drug and Alcohol Studies conducts research on drug and alcohol abuse. Both receive federal funding and offer research assistantships to graduate students.

REQUIREMENTS FOR ADMISSION

Applicants should submit transcripts of all academic work, Graduate Record Examination scores, and three letters of recommendation. Applications for fall admission should be completed by March 1. Students applying for financial aid for fall admission must complete applications by 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 and research assistantships are available to graduate students at the M.A. and Ph.D. levels. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREES

Students are required to complete 30 credit hours for the **Master of Arts degree in sociology**. The courses required are as follows:

- SOCI 605 Data Collection (3 credits)
- SOCI 612 Foundations of Sociological Theory (3 credits)
- EDST 861 Introduction to Statistical Inference (3 credits)

In addition, one course must be taken from any two of the following three areas: deviance, social stratification, and organization. The remainder are selected in consultation with an advisor. Students may satisfy the requirement by completing 30 credits of course work and preparation of written examination, by completing 24 credits of course work and preparation of a thesis (6 credits), or by completing 24 credits of course work and an internship. The internship M.A. is intended for students who do not plan to go on for the Ph.D. degree.

For the **Master of Arts in Criminology degree** students must take 30 credits plus comprehensive examinations in Criminology and Theory or Methods, 24 credits plus a thesis, or 24 credits plus an internship. The courses required are as follows:

- SOCI 605 Data Collection (3 credits)
- SOCI 612 Foundations of Sociological Theory (3 credits)

- EDST 861 Introduction to Statistical Inference (3 credits)
- SOCI 835 Criminal and Delinquent Behavior (3 credits)

In addition, three courses (9 credits) must be taken from offerings in the areas of Criminal and Delinquent Behavior and Criminal Justice and Legal Systems.

For the **doctoral degree in sociology** the requirements are a minimum of 12 credit hours in substantive sociology courses, one year in residence, 9 dissertation hours, the four courses required for the Master of Arts course requirement, and:

- SOCI 813 Current Issues in Social Theory (3 credits)
- EDST 845 Regression Models in Education (3 credits)

And one of the following:

- SOCI 606 Advanced Data Collection (3 credits)
- SOCI 611 Techniques of Demographic Analysis (3 credits)
- SOCI 614 Data Analysis (3 Credits)

Students must also successfully complete written comprehensive examinations in two substantive areas and are expected to complete a dissertation representing an original contribution to the sociological literature.

For the **doctoral degree in criminology**, the following courses are required in addition to the Master of Arts requirements:

- SOCI 813 Current Issues in Social Theory (3 credits)
- EDST 845 Regression Models in Education (3 credits)
- SOCI 836 Seminar in Criminal and Delinquent Behavior (3 credits)

And one of the following:

- SOCI 606 Qualitative Methods (3 credits)
- SOCI 611 Techniques of Demographic Analysis (3 credits)
- SOCI 614 Data Analysis (3 credits)

and at least 15 credits from among the offerings in Criminal and Deviant Behavior, Criminal Justice and Legal Systems and related courses.

Students must also complete two written comprehensive examinations, one in Criminology and one in another standing area, and are expected to complete a dissertation.

THEATRE

Telephone: (302) 831-2201

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 Studies 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 \$40 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).

FINANCIAL AID

The PTPP offers a variety of financial awards ranging from full fellowships to partial tuition scholarships. All awards are based on merit. Fellowship and tuition scholarships 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. 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.

YEAR 1: Students enroll in the following courses during year #1.

	Crs.
THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	6
(3 credits each semester)	
THEA 665 Theatre Literacy (2 credits each semester)	4
Total Year #1	22

YEAR 2: Students enroll in the following courses during year #2.

THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	6
(3 credits each semester)	
THEA 665 Theatre Literacy (2 credits each semester)	4
Total Year #2	20

YEAR 3: Students enroll in the following courses during year #3.

THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	10
(5 credits each semester)	
Total Year #3	20

TOTAL GRADUATION CREDITS 62

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.

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 633	Stage Management Organizational & Managerial Techniques IA (2 credits fall)	2
THEA 634	Stage Management Organizational & Managerial Techniques IB (1 credit spring)	1
THEA 639	Stage Management Production Skills IA (2 credits fall)	2
THEA 640	Stage Management Production Skills IB (2 credits spring)	2
THEA 645	Rehearsal & Performance/Stage Management (1 credit fall; 2 credits spring)	3
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 680	Lighting Production (1 credit fall)	1
THEA 681	Audio Production (1 credit spring)	1
THEA 693	Production Coordination (1 credit each semester)	2

Total Year #1 22

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 635	Stage Management Organizational & Managerial Techniques IIA (2 credits spring)	2
THEA 641	Stage Management Production Skills IIA (2 credits fall)	2
THEA 645	Rehearsal & Performance/Stage Management (3 credits each semester)	6
THEA 648	Costume Construction (1 credit spring)	1
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 674	Scenery Production (1 credit fall)	1
THEA 675	Properties Production (1 credit spring)	1

Total Year #2 21

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 636	Stage Management Organizational & Managerial Techniques IIB (1 credit spring)	1
THEA 642	Stage Management Production Skills IIB (1 credit fall)	1
THEA 645	Rehearsal & Performance/Stage Management (4 credits each semester)	8
THEA 694	Special Topics in Theatre Production (2 credit each semester)	4

Total Year #3 18

TOTAL GRADUATION CREDITS 61

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 drafting (manual and CAD), properties construction, audio production, scenic painting, stage carpentry, stage electronics, 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.

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 674	Scenery Production (1 credit fall)	1
THEA 675	Properties Production (1 credit spring)	1
THEA 680	Lighting Production (1 credit fall)	1
THEA 681	Audio Production (1 credit spring)	1
THEA 686	Information Technologies for Theatre (1 credit fall)	1
THEA 687	Scenery Painting (1 credit spring)	1
THEA 688	CAD & Scenery Construction (1 credit spring)	1
THEA 692	Production & Performance/Technical (1 credit fall, 2 credits spring)	3
THEA 693	Production Coordination (1 credit each semester)	2

Total Year #1 20

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 639	Stage Management Production Skills IA (1 credit spring)	1
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 676	Scenery: Metalworking (1 credit fall)	1
THEA 677	Properties: Upholstery & Draping (1 credit fall)	1
THEA 678	Properties: Casting & Mold-making (1 credit spring)	1
THEA 679	Scenery: Stage Rigging (1 credit spring)	1
THEA 682	Lighting Design (1 credit spring)	1
THEA 689	Advanced Scene Painting (1 credit fall)	1
THEA 690	Advanced CAD (1 credit fall)	1
THEA 692	Production & Performance/Technical (3 credits each semester)	6

Total Year #2 22

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 692	Production Preparation & Performance/Technical (4 credits each semester)	8
THEA 694	Special Topics in Theatre Production (3 credits each semester)	6

Total Year #3 18

TOTAL GRADUATION CREDITS 60

WINTERTHUR PROGRAM IN EARLY AMERICAN CULTURE

Telephone: (302) 831-2678

The Winterthur Program in Early American 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 Henry Francis du Pont Winterthur Museum 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 directly to the Winterthur Program in Early American Culture 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 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 full tuition and an annual stipend. Application for the program and these fellowships can only be made by applying to the program through the Director's office, 304 Old College. 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, and 19th centuries. Extracurricular activities 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 chosen from art history, history, and English. In addition to traditional courses, these departments also embrace such fields as folklore, vernacular architecture, and media study.

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 Early American Culture.

examinations must be passed, as well as a final dissertation defense. The program is to be completed within five years, including a minimum of one year in residence.

Some fellowship support is available in honor of Dr. Paul Coremans, founder of the Institut Royal du Patrimoine Artistique in Belgium and facilitator of the type of interdisciplinary research in conservation expected of students in the Ph.D. program.

ART HISTORY

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

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 strength on the graduate level 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. 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 slide collection, the Decimal Index of the Art of the Netherlands, the "Illustrated Bartsch," the Wayne Andrews photographic archive of American architecture, a cumulative index of dissertations and theses in American art, and a photographic Index of American Sculpture. 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 M.A. 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 Human Resources, Education and Public Policy, CHAD is cosponsored by the departments of Art History, History, and Geography, the College of Engineering, and the Museum Studies Program, American 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 Winterthur Museum Library, open to graduate students in art history, is especially strong in American art and in sources of design and both social history and British artistic backgrounds. 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 Studies by January 15. Students requesting fellowships or assistantships beginning in the fall semester must have their completed applications in the Office of Graduate Studies prior to January 15. See also the chapter "Graduate Admissions" in this catalog.

Admission to the graduate program in Art History is an academic judgment matter. Students are admitted 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 the chapter "Graduate Fellowships and Assistantships" in this catalog.

REQUIREMENTS FOR THE DEGREES

Requirements for the Master of Arts degree consist of a minimum of 24 hours of course work, a master's thesis (research essay), and a language examination (either French, German, or Italian). Individual programs will be arranged according to each student's needs in consultation with a faculty adviser. With the adviser's consent, students may substitute a limited number of courses in such related fields as anthropology, American studies, history, literature, urban affairs, and philosophy. Normally, the degree requirements may be completed in two years of full-time study.

Students will normally complete the M.A. degree before applying for candidacy to the Ph.D. program. Students who are accepted with an M.A. degree from an accredited art history program may enter the Ph.D. program directly. One major field and one minor field, in which students will be examined after completing 24 hours of course work, will be chosen from the following areas: Ancient, Medieval, Italian Renaissance, Northern Renaissance, Seventeenth and Eighteenth Century, Nineteenth and Twentieth Century, and American, with additional minors available in the History of Photography, Decorative Arts, Graphic Arts, History of Book Illumination, and History of Architecture. Upon petition, minor fields may be tailored to the student's special interests. Candidates for the Ph.D. must pass written examinations in German and either French or Italian. Candidates then produce a dissertation, which is defended in an oral examination.

RELATION TO THE M.A. IN EARLY AMERICAN CULTURE

At the University of Delaware, there are two avenues to the historical study of the visual arts: (1) The M.A. and Ph.D. program in the Department of Art History; and (2) the M.A. in Early American 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 Early American 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 Ph.D. level especially encouraged.

At the Ph.D. 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

Telephone: (302) 831-6977

Master of Science and Doctor of Philosophy degrees are offered in the fields of ecology, genetics and molecular biology, microbiology, neurobiology, and physiology-anatomy. Admission to the graduate program in biological sciences requires demonstrated academic excellence and the following (or the equivalent): three years of biological sciences (two years for students with undergraduate majors in other than the life sciences); one year of mathematics, preferably to include calculus and/or statistics; one year of college physics; one year of inorganic 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.

The Department of Biological Sciences has modern well-equipped laboratories for research and teaching in physiology, microbiology, the neurosciences, ecology, genetics, and developmental, organismic, cellular, and molecular biology. Facilities include electronic instrumentation, ultra-centrifuges, liquid scintillation and gamma spectrometers, fluorescent microscopes and spectrophotometers, constant temperature rooms and growth chambers, extensive animal research facilities, and scanning and transmission electron microscopes with attendant equipment. Computer facilities with access to mainframe sequence analysis and image analysis (IRIS and SUN workstations) are also available. In addition to Wolf Hall, the Department occupies much of the McKinly Laboratory Building.

REQUIREMENTS FOR ADMISSION

Admission to the Biological Sciences graduate program is competitive and based upon assessment of an applicant's overall strengths and aptitude to perform well in the chosen area of research interest. Applicants must meet the graduate admission requirements of the department, including a scholastic index of 2.8 overall and 3.0 in the sciences. Graduate Record Examination Aptitude and Advanced Biology Test scores are required. Competitive scores are approximately 550 (Verbal), 650 (Quantitative), 650 (Advanced Biology). Application is made to the University's Office of Graduate Studies. In addition, three letters of recommendation from persons able to judge the applicant's ability to pursue graduate study should be sent to the Chair, Department of Biological Sciences. See also the chapter in "Graduate Admissions" in this catalog.

FINANCIAL AID

Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog.

REQUIREMENTS FOR THE DEGREES

The Master of Science program requires 24 hours of courses, 6 hours of thesis and successful completion of the preliminary examination,

administered after the first year. Primary emphasis is on research that culminates in the thesis. A written research-based thesis and the oral defense of it are required.

For the Ph.D. degree, successful completion of the preliminary and qualifying examinations as well as the presentation and defense of a written research proposal and dissertation are required. The Ph.D. requires 30 credit hours including 9 hours of dissertation. The preliminary examination is administered after two semesters of study and is designed to identify the student's strengths and weaknesses and suitability for further graduate study. The qualifying examination is an in-depth examination of the student's research specialty and is administered after six semesters. Formal courses should be completed as soon as possible to allow time for independent study and research. Experience in the teaching of undergraduates is required of all candidates. It is expected that a significant portion of the dissertation will be suitable for publication.

CHEMISTRY AND BIOCHEMISTRY

Telephone: (302) 831-1247

The Department of Chemistry and Biochemistry offers programs leading to the Ph.D., M.S., and M.A. degrees. Financial support for Ph.D. 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 biology, engineering, mathematics, and physics 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 adviser. A reading knowledge of a modern foreign language is required for some areas for the Ph.D.

Three major facilities support the research of faculty and students. These laboratories are operated by Ph.D.-level scientists who provide analytical service and training courses. The Blue Hen NMR Complex houses five 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 six 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 and LC/MS instruments are available for routine student use. The X-ray laboratory includes two state-of-the-art diffractometers for small molecule crystallography. 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

Apart from the generally stated University requirements, all students are expected to fulfill a set of proficiency requirements upon entering the program. The M.A., M.S., and Ph.D. degrees require at least eighteen credits in graduate level courses (600-level or higher) excluding research and/or dissertation. At least nine coursework credits must be taken outside the student's area of concentration. Scientific courses at the 600-level or higher offered by other departments may be included in the coursework requirement if approved by the Chemistry and Biochemistry Department. The M.A. and Ph.D. degrees require successful completion of a series of cumulative examinations. The M.S. and Ph.D. degrees require a thesis based on original research. The M.S. degree requires a minimum of six and a maximum of twelve credit hours of thesis and/or research. The Ph.D. degree requires a final public oral defense of the dissertation. Some areas of concentration require successful completion of a Language Examination. Courses that are normally required for specific areas of concentration are as follows:

Analytical.....	CHEM 620, CHEM 621, CHEM 622, CHEM 623, CHEM 624, CHEM 625, CHEM 626, CHEM 627, CHEM 820
Biochemistry.....	CHEM 641, CHEM 642
Inorganic.....	CHEM 651, CHEM 652, CHEM 654
Organic.....	CHEM 633, CHEM 634, two additional courses with CHEM 63x or CHEM 83x designation.
Physical.....	CHEM 671, CHEM 672, CHEM 674, CHEM 677

Specific details of the requirements for the advanced degrees in chemistry may be obtained by requesting them directly from the Chemistry and Biochemistry Department.

COMMUNICATION

Telephone: (302) 831-8041

The Department of Communication offers a program leading to a Master of Arts degree in communication. A student may elect to pursue a general graduate communication degree or may specialize within one of the department's areas of study: organizational communication, mass communication, or interpersonal communication. The program is designed to produce competent consumers of empirical research and theory in preparation for Ph.D. studies or for a career as a communication specialist if this is a terminal degree. The program is not broadcast or production oriented.

REQUIREMENTS FOR ADMISSION

To be considered for admission, all applicants are evaluated on the following criteria: (1) undergraduate academic work; both total GPA and major GPA are considered (a 3.0 in both categories is the generally accepted minimum); (2) GRE scores; TOEFL scores; applicants must obtain a minimum score of 550 on each section of the GRE; foreign students must have a minimum score of 600 on the TOEFL; (3) three letters of recommendation; and (4) 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. 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

A limited number of teaching assistantships are available and are awarded competitively in the spring of each year. The application deadline is March 1. 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

The program necessitates that full-time students begin the course of study in the fall semester. Thirty credit hours are required to complete the degree. Five courses (15 credits) are required. Three courses (9 credits) are required of all students: COMM 601, Theory and Epistemology of Communication; COMM 603, Research Methods-Procedures; and COMM 604, Research Methods-Analysis. The two remaining required courses (6 credits) are selected from three theoretical courses: COMM 670, Theory of Mass Communication; COMM 630, Theory of Interpersonal Communication; and COMM 610, Theory of Organizational Communication. Finally, the Master of Arts candidate may write a thesis or take a comprehensive examination on all course work. The student who elects to write a thesis must take 6 credits of COMM 869, Master's Thesis. Graduate courses are offered in organizational communication, communication theory, mass communication, public relations, and interpersonal communication. There are also opportunities for independent study and/or internships. There are no language requirements. Six graduate credits may be taken outside the Communication Department in a related area, if approved by the graduate student's committee.

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

COMPUTER AND INFORMATION SCIENCES

Telephone: (302) 831-2712

The Department of Computer and Information Sciences offers programs leading to the Ph.D. and M.S. degrees. Computer Science is a vigorous and relatively new field for research and study. 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 areas include artificial intelligence (knowledge-based and expert systems, natural-language processing, robotics, multiagent systems, planning and problem solving), computational theory (computational learning theory, design and analysis of algorithms, recursive function theory), compiler optimization and compilation for parallel machines, networks and parallel computing (distributed computing, formal protocol specification, local area networks, algorithm and architecture design for massive parallelism, networks management, performance modeling, simulation), graphics and image processing, rehabilitation engineering (augmentative communication, speech recognition and enhancement), software engineering (real-time software design), and symbolic mathematical computation (algebraic algorithms, parallelization, rewrite systems).

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 M.S. and Ph.D. programs is that the Ph.D. is designed to prepare students to conduct advanced research.

The primary goal of the graduate program is to train people to think within the rapidly changing discipline of computer and information sciences. Of course, achieving this primary goal necessitates achieving the secondary goals of conveying skills and knowledge useful in the discipline.

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:

1. The equivalent of a bachelor's degree at the University of Delaware. A minimum grade average of 3.0 in the major field of study and an overall cumulative index of 2.5 is required.
2. 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,
 - assembly language programming,
 - data structures,
 - computer architecture.
 - operating systems.

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.
3. Strong applicants lacking prerequisites may be 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.
 4. A minimum combined score of 1750 on the verbal, quantitative, and analytical parts of the Graduate Record Examination Aptitude Test.
 5. 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.
 6. For applicants whose first language is not English, and who have not received a degree at a U.S. college or university, a minimum TOEFL score of 550 for admission without financial aid is required by the University. For applicants who seek a teaching assistantship appointment, a TOEFL score of 600 is required. In addition, for applicants who have not graduated from an institution whose principle language of instruction is English, the Test of Spoken English is highly recommended.
 7. Three letters of recommendation from professors (preferably), employers, or others who are able to assess your potential for success in graduate studies.

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 M.S. degree, or up to five years for the Ph.D. 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 Ph.D. preliminary examination after no more than three semesters of study. Students entering with an M.S. degree in Computer and Information Sciences (or a related area) are expected to take and pass the Ph.D. 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 length of support. With regard to financial aid, Ph.D. 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 MASTER OF SCIENCE 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 Studies.

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 Ph.D. 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 — Core Areas:

- Hardware Systems
 - Computer Architecture (CISC 662)
 - Operating Systems (CISC 663)
 - Computer Networks (CISC 650)
 - Software Systems
 - Programming Languages (CISC 670)
 - Theory of Translators (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 core courses, including at least one in each of the three areas.
 3. A grade of B- or better is required in any four of the core courses taken.
 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 CISC 869, which are included in the thirty credits needed for the M.S. 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 write an M.S. thesis.

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 M.S. thesis **only if** the areas of study do not overlap, as approved by the CISC Graduate Committee. The M.S. thesis student must still satisfy all other Department requirements.

REQUIREMENTS FOR THE PH.D. 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 Ph.D. is an individualistic degree. As soon as possible in the program, each candidate should find a faculty member to act as adviser 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. Department General Requirements

The Department requires the following:

1. **Course Work.** Each candidate must complete all requirements of a University of Delaware M.S. 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 CISC 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 M.S. degree, and show the equivalent of the 30 credit M.S. degree offered by the CISC Department.
Each candidate is required to complete a major and minor field of study based on a minimum of 12 additional credits beyond the master's degree. These 12 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 and a minor area, a candidate will be required by the adviser to complete more than 12 credits.
2. **Research Ability.** Ph.D. 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 M.S. 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 CISC undergraduate major and in one year of full-time graduate study including the core areas of the M.S. program. The detailed composition of the preliminary exam, within the constraint of testing breadth of CISC 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 coming in with a Bachelor's degree should normally take it 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 three times.
4. **Advisory Committee.** Each candidate 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 CISC Department faculty. The committee chair is the faculty member in charge of the candidate's research and dissertation. At least two members represent the major field of study and one the area of minor study. At least one member must be from outside the CISC Department. The proposed advisory committee must be submitted to the Graduate Committee for approval. It must then be approved by the CISC 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 major area, minor area, and 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, research interests, and major and minor areas of study. The proposal and plan are submitted to the advisory committee and are considered as input to the qualifying examination. Copies of "Discussion on Ph.D. 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 Ph.D. 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.

ENGLISH

Telephone: (302) 831-2363

The Department of English offers programs leading to the M.A. (with concentrations in Literature and in Literature and Pedagogy) and the Ph.D. There is also a certificate program in Business and Technical Writing.

REQUIREMENTS FOR ADMISSION

An applicant for the M.A. 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 Quantitative tests and **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 Ph.D. program must first gain admission to the M.A. program. Students who distinguish themselves in the M.A. program are then given permission to enter the Ph.D. program.

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

The English Department recognizes the application deadlines of July 1 for the Fall semester and December 1 for the Spring semester, but the department encourages much earlier applications, especially for the Fall semester, and it requires a deadline of March 1 for anyone seeking a fellowship or teaching assistantship in the Fall semester. In recent years, during which the increasing number of applicants has made the competition for admission much more rigorous, most of the admissions for the Fall semester have been determined by April 15.

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

The Department of English funds students each year, reserving awards for first-year M.A. and Ph.D. students. Funded students are granted one of the following awards: a fellowship; a teaching, research, editorial, or administrative assistantship; an assistantship in the University Writing Center; or an internship in a university administrative office. 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. Teaching assistants who serve as research, editorial, or administrative assistants and those who teach in the Writing Center work 15-20 hours per week each semester, as do those who serve as interns in other university offices. Fellows have no teaching or other duties.

REQUIREMENTS FOR THE DEGREES

The M.A. in Literature is granted upon the completion of eight semester courses (24 credit hours), a demonstration of ability to work in a foreign language, and the writing of a thesis (ENGL 869, 6 credit hours). In lieu of a thesis, the candidate for the M.A. may complete two additional courses (6 credit hours), ordinarily at the 800 level.

For the M.A. in Literature and Pedagogy, students may elect up to half of their course work in pedagogy and may satisfy their language requirement by taking an additional course in the history of the English language. Candidates seeking state certification must also take student teaching.

The Certificate Program in Business and Technical Writing requires five courses in the Department and two electives to prepare participants for careers in a number of professional writing specialties.

The Ph.D. is granted when the following requirements have been met: (1) completing at least eight courses (24 credit hours) beyond those taken for the M.A.; (2) satisfying the residency requirement of full-time study in two consecutive semesters; (3) demonstrating an ability to work in a second foreign language or advanced ability in one foreign language; (4) passing oral Ph.D. Comprehensive Examinations; (5) passing an oral Ph.D. Qualifying Examination in an area of specialization; (6) writing a dissertation; (7) passing an oral examination on the dissertation and related topics.

FOREIGN LANGUAGES AND LITERATURES

Telephone: (302) 831-2591/2592

The department offers two Master of Arts programs, the M.A. in Foreign Languages and Literatures and the M.A. 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. Secondary school teachers can participate in the Summer Institute for Foreign Language Teachers.

M.A. 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:

- 1) B.A. or equivalent in the target language/literature, or in another appropriate discipline.
- 2) Undergraduate Grade Point Average of 2.75 overall, and 3.25 in the proposed M.A. major subject.
- 3) GRE General Test for all students.
- 4) TOEFL for international students (550 minimum for admission to the program; 600 minimum for teaching assistantship).
- 5) Three letters of recommendation.

Admission to the M.A. 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 language and literature.

Candidates must pass a written and oral comprehensive examination based on reading lists in the major literature, as well as a reading competency examination in a second foreign language.

M.A. 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.

Requirements for Admission

The requirements for admission are:

- 1) B.A. or equivalent in the target language/literature, or in another appropriate discipline.
- 2) Undergraduate Grade Point Average of 2.75 overall, and 3.25 in the proposed M.A. major subject.
- 3) GRE General Test for all students.
- 4) TOEFL for international students (550 minimum for admission to the program; 600 minimum for teaching assistantship).
- 5) A letter of application written in the foreign language.
- 6) An interview with at least one member of the Foreign Language Education Committee or delegate conducted at least partially in the target language.
- 7) Three letters of recommendation.

Admission to the M.A. 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.

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 March 1, as the initial round of funding decisions will be made in mid-March. Students who miss the March 1 deadline may still be considered for any teaching assistantships or graduate scholarships not assigned in March.

Requirements for the Degree

Option I

Course work consists of 30 credits, including at least 15 in the major language (French, German, Spanish) and 9 in foreign language pedagogy; the remaining 6 credits, chosen with the consent of the adviser, can be in these or closely related fields.

Candidates must pass a written and oral comprehensive examination based on reading lists in the major literature and in foreign language pedagogy, as well as a reading competency examination in a second foreign language.

Option II (For In-Service Teachers Only)

This option is available only to current in-service teachers enrolled in the Summer Institute for Foreign Language Teachers.

Course work consists of 30 credits, including at least 9 in the major literature and 9 in foreign language pedagogy. At least six credits must be taken during the regular academic year.

Candidates must pass oral and written examinations emphasizing the theoretical and practical aspects of teaching language and literature (one section of both oral and written exams will be in the target language; the literary portion will be based on the year's Advanced Placement reading list), and achieve a rating of at least Intermediate High on the ACTFL OPI or the SOPI. Students must also present a portfolio of their work.

FINANCIAL AID

The Department of Foreign Languages and Literatures has two principal types of awards: teaching assistantships and graduate scholarships. Graduate Scholars teach six hours per week. Teaching Assistants may be assigned to the classroom (6 classroom hours per week), the Media Center (16-20 hours per week) or to individual faculty to serve as research or administrative assistants (16-20 hours per week). Graduate students who teach are assigned as team-teachers of elementary or intermediate foreign language courses. Experienced instructors take the MWF portion of the 5 day-a-week course, while graduate students are responsible for the TR portion.

STUDY ABROAD OPPORTUNITIES

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

SUMMER INSTITUTE FOR FOREIGN LANGUAGE TEACHERS

The Summer Institute for Foreign Language Teachers offers teachers of French and Spanish an opportunity to renew their speaking and writing skills in the language they teach, deepen their appreciation of the cultural content of foreign languages, and sharpen their pedagogical tools. Except for the pedagogy course (which comprises all modern languages), all instruction and classroom activities are conducted in the target language.

While it is not necessary to do so, some participants choose to pursue one of the department's M.A. programs, earning as many as 9 credits per summer towards their degrees.

GEOGRAPHY

Telephone: (302) 831-2294

The department offers programs leading to the Master of Arts and Master of Science degrees in geography and the Ph.D. degree in climatology. The graduate program provides the opportunity for students to interact frequently with a staff whose interests touch upon one of two particular themes: climatology, and human geography.

The climatology program emphasizes physical, synoptic, dynamic, and water budget climatology, as well as glaciology and climatic geomorphology. Climate research is directed toward solving numerous human and environmental problems.

The human geography program covers a broad range of themes approached from cultural-historical, socio-economic and humanistic perspectives. The study of landscapes, geographic ideas, perceptions and attitudes in a cross-cultural context (including philosophic and literary aspects) is another area of the program. Interdisciplinary work with other departments and the colleges of Agriculture and Natural Resources and Marine Studies is encouraged.

A University Center for Climatic Research has been established in the department, which also houses the Office of the State Climatologist for Delaware. Facilities include laboratories for cartography, climatology, and computer analysis. Graduate students have ready access to the University's Unix cluster with a variety of high-end machines. Departmental facilities include a smaller Unix cluster based on an SGI Challenge, Sparc stations, X terminals and PCs. Locally supported software includes: ArcInfo and ArcView GIS, and the McIDAS/Gempak weather analysis system. All of the department's computing facilities are fully integrated into the campus and worldwide networks. The department also is well-equipped with instrumentation for microclimatic studies and possesses an abundance of digitally-stored weather and climate data, principally for large scale investigations.

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.

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 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 PH.D. DEGREE

Applicants to the Ph.D. program in climatology are expected to have completed a master's degree in geography-climatology, meteorology, or a related discipline. Students in this program must also have completed mathematics through ordinary differential equations

(MATH 302) and must demonstrate a knowledge of at least one higher level computer programming language. Ph.D. students are expected to obtain an in-depth knowledge of two areas. One of these must be topical, such as bioclimatology, physical climatology or urban climatology, and the other must be methodological such as statistical methods, mathematics or computer science.

Students are also expected to have a broad knowledge of climatology and to demonstrate a high level of professional competence by passing a written qualifying examination, an oral examination and an oral dissertation defense. A description of the Ph.D. program in climatology can be obtained by contacting the Geography Department.

GEOLOGY

Telephone: (302) 831-2569 or 831-8750

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. The Department of Geology offers both field-oriented and laboratory-oriented research programs that take advantage of the University's geographic proximity to Appalachian, Atlantic Coastal Plain, and coastal terrains. Major research emphasis is Quaternary Geology.

The Department of Geology has cooperative programs with several nearby institutions, including the Delaware Geological Survey, U.S. National Museum, and Lamont-Doherty Earth Observatory. Departmental research is frequently carried out in cooperation with other departments and with the College of Marine Studies, which has a marine field station in Lewes, Delaware, and a seagoing oceanographic research vessel, *Cape Henlopen*.

The department owns a scanning electron microscope with attached x-ray spectrometer, x-ray diffraction apparatus, paleomagnetic equipment, laser particle counter, stereo-zoom transfer scope facility, diverse computer capability including Sun Workstations, largescale digitizer, gas and liquid chromatographs, ground penetrating radar, multichannel seismic equipment, various coring and drilling equipment, laser theodolite surveying system, and has ready access to nearly all other commonly used tools of geological and geophysical research. The department has a stable graduate program with 20 to 25 graduate students. Recent graduates have found positions in environmental consulting firms, academic institutions, federal and state geological surveys, and petroleum and mining industries.

REQUIREMENTS FOR ADMISSION

Admission to the graduate program in the Department of Geology is evaluated on the basis of the applicant's GRE scores, undergraduate record, three letters of recommendation and research interests. Applicants should have a combined verbal and quantitative GRE score of at least 1050. A minimum TOEFL score of 600 is required for foreign applicants for whom English is not the first language. The Department will consider qualified applicants without a previous degree in geology, although additional preliminary work may be required. Admission to the graduate program in the Department of Geology 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.

REQUIREMENTS FOR THE DEGREES

Requirements for the Master of Science degree include 30 credits of graduate study (6 of which are thesis credits and 3 are one-credit

800-level courses), 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 7 one-credit 800-level courses), and the research, preparation, and defense of the dissertation. All course programs are 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 adviser and thesis or dissertation committee.

Because of the value of the teaching experience, Ph.D. candidates in geology must teach a course or laboratory section for at least one term.

HISTORY

Telephone: (302) 831-8226

The Department of History offers M.A. and Ph.D. programs in American history, European history, and the history of technology. In conjunction with these, it has special programs focusing on the history of industrialization and on American social and cultural history, and provides an opportunity for students to earn a certificate in Museum Studies. The Department offers more limited graduate study in Ancient, African, Asian, Latin American, and Middle Eastern history, as well as courses in history education.

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

THE UNIVERSITY OF DELAWARE-HAGLEY PROGRAM

Prospective students with interests in the history of technology, science, business, economy, society, or labor may apply for fellowships in the University of Delaware-Hagley Program. The program focuses on the history of industrialization especially in comparative perspectives. University of Delaware-Hagley fellows may specialize in American history, European history, or the history of science and technology.

HISTORY OF AMERICAN CIVILIZATION

The Department of History in cooperation with the Winterthur Museum sponsors a Ph.D. 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 M.A. or Ph.D. candidate from any of the History graduate programs may qualify for a certificate in Museum Studies upon satisfactory completion of 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 M.A. and Ph.D. levels are offered. **Plan A** (Terminal 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 a sample of their research writing. **Plan B** (M.A. leading to Ph.D. degree) and Ph.D.: 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 a sample of their research writing. These averages are only minima and do not guarantee admission. The History Department normally accepts applications for all History programs **for the fall semester only**. The deadline for application is January 31, but early application is strongly encouraged. Applicants must submit three letters of recommendation. Students considering graduate work in history at the University of Delaware should write to the department for its bulletin *Guidelines to Graduate Programs in History*.

REQUIREMENTS FOR THE DEGREES

Candidates for the M.A. 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, and 2 research and writing seminars or one research seminar and a 6-credit M.A. thesis. Additionally, the Graduate Studies Committee will review the record of each M.A. student after he or she has completed three full semesters (or 21 credits) of graduate study; on the basis of this review the committee will inform the student whether he or she is making satisfactory progress toward the M.A. degree.

The Ph.D. degree recognizes the candidate's command of specific fields of history as well as the ability to conceive and execute a Ph.D. dissertation. Doctoral students do most of their work independently, under the supervision of their dissertation directors and other faculty members. The following specific requirements must be met: 9 hours of formal course work other than independent study courses which must include two of the department's basic historiography courses; demonstration of reading competence in a foreign language (faculties in certain specialties require additional language or skill requirements); passage of major and minor field exams; a dissertation prospectus submitted to the Graduate Studies Committee no later than six months following the field exams; and an oral exam in a field related to the student's dissertation topic that will include a discussion of the dissertation prospectus. After the preceding requirements have been met, the candidate must finish a dissertation and defend it in an oral exam.

MASTER OF ARTS IN LIBERAL STUDIES

Telephone: (302) 831-6075

REQUIREMENTS FOR THE DEGREE

Students working for the M.A.L.S. degree must take two interdisciplinary core courses, choose a series of interdisciplinary electives designed specifically for the program, and complete either a master's thesis or a synthesis project. By advisement of the Director and with consent of the course instructor, M.A.L.S. students may enroll in regular graduate offerings in the participating departments.

Designed primarily for adult, vocationally established individuals, the M.A.L.S. degree offers interdisciplinary graduate education centered in the humanities. The M.A.L.S. 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 include an official transcript of previous undergraduate and graduate studies, three supporting letters from individuals who can discuss the applicant's strengths and capabilities, and a short essay of about three pages describing the applicant's intellectual interests and how the applicant thinks these can be developed in the M.A.L.S. 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. 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.

LINGUISTICS

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

The Department of Linguistics offers programs leading to M.A. and Ph.D. degrees in Linguistics. The M.A. in Linguistics is a flexible degree, allowing students to design programs of study in areas of theoretical linguistics, applied linguistics (including teaching English as a second language) and cognitive science. Areas for Ph.D. specialization include theoretical linguistics (especially syntax and phonology), applied linguistics and computational linguistics. The Department of Linguistics also administers the program in Cognitive Science.

REQUIREMENTS FOR ADMISSION

Students with a B.A./B.S. or M.A./M.S. 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 math combined is normally required; the analytical score is also considered), and official transcripts of all previous work. Foreign students whose native language is not English must also submit scores on the TOEFL, on which a minimum of 550 is normally required. For these foreign students, the TOEFL score will be considered as the verbal section of the GRE when the TOEFL score is higher. In all cases, however, scores on all sections of the GRE must be submitted. Foreign students whose native language is not English and who are awarded a teaching assistantship must meet the Graduate School requirement for performance on either the Speak Test or the Test of Spoken English (TSE). The TSE may be taken overseas at any TOEFL center. Students should consult the appropriate section of the catalog for details of this requirement.

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 Ph.D. 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.

REQUIREMENTS FOR THE MASTER'S DEGREE

For the M.A., students must satisfy the requirements of either Option 1 or Option 2. Option 1 requires completion of 30 credit hours and a grade of PASS on the same Qualifying Exam taken by Ph.D. students. Option 2 requires completion of 36 credit hours to be planned in consultation with the student's adviser and the Director of Graduate Studies. Both options require a) that at least 21 of the required credit hours be taken in the Linguistics Department and b) the completion of at least one 800-level seminar. Full details of all programs are available from the department's Director of Graduate Studies.

REQUIREMENTS FOR THE PH.D. DEGREE

Students are required to take 69 credits beyond the B.A./B.S.: 60 credits in courses proper and 9 in dissertation. Students entering with a credited M.A./M.S. in an appropriate area as determined by the department must take 39 credits: 30 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, either LING 696 Psycholinguistics, or LING 680 Sociolinguistics, 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 in theoretical and applied linguistics, 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. While there is no formal graduate degree in Cognitive Science, the Ph.D. 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.

MATHEMATICAL SCIENCES

Telephone: (302) 831-2653

The Department of Mathematical Sciences offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy in Applied Mathematics and in Mathematics.

Most of the major areas of mathematics are included among the research interests of the faculty of the department, but the areas most heavily represented are applied mathematics, partial differential equations, integral equations, inverse problems, complex function theory, discrete mathematics, topology, and probability.

Each of the graduate programs in the department is relatively small allowing for close contact between graduate students and faculty. Individual attention is common. There are several active seminars on research topics and there is steady additional stimulus from professional visits by scientists from the U.S. and abroad.

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 ORE Aptitude Test. The advanced test in mathematics is highly recommended.

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 guarantee financial aid for 10 semesters for students entering with a Bachelor's degree; those entering with a Master's degree can expect to receive financial aid for 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 Bachelor's degree must pass the Candidacy Exam by the beginning of his/her 6th semester (in February). 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 guaranteed 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 the following August, 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

Master's degree students must complete 30 hours of course work beyond the Bachelor's degree. Students must maintain a GPA of 3.0 or better.

Core requirements (18 credit hours): MATH 600, MATH 602, MATH 611, MATH 616, MATH 672, and MATH 807.

Electives (6 credit hours): to be approved by the Graduate Committee.

Additional Requirements (6 credits):

For the Applied Mathematics M.S.: MATH 617 and a one semester course in an area of application (ELEG 667, CHEG 830, CIEG 639, MEEG 630 or a course approved by the graduate committee).

For the Mathematics M.S.: MATH 650 and MATH 688.

REQUIREMENTS FOR THE PH.D. DEGREE

Students with no prior graduate course work must complete 54 credit hours of courses, plus an additional 9 credits of MATH 969 (Doctoral Dissertation). A maximum of 6 credit hours of research (MATH 868) is allowed to count as an elective in the 54 credit hour requirement. Of

the 54 hours, a maximum of 27 credit hours of 600-level courses in the mathematics department is allowed. All electives must be approved by the graduate committee. After completing their course requirements, students are expected to enroll for at least one course each semester (which may be as a listener) in addition to MATH 964 or MATH 969. A GPA of 3.0 or better must be maintained.

Students entering with a Bachelor's degree must pass the Preliminary Exam in order to continue beyond their second year (beyond the first year for those entering with a Master's degree). A second written exam, the Candidacy Exam, must be passed in order for a student to be admitted to Ph.D. candidacy.

Core Requirement (21 credits): All Applied Mathematics and Mathematics students must complete MATH 600, MATH 602, MATH 611, MATH 616, MATH 672, MATH 806, MATH 807.

Doctoral Dissertation (9 credits): MATH 969.

Additional requirements (33 credits):

For the Applied Mathematics Ph.D.: MATH 612, MATH 617, MATH 810, and two semesters in areas of application (ELEG 667, CHEG 830, CIEG 639, MEEG 630 or courses approved by the graduate committee) plus 18 credits of electives

For the Mathematics Ph.D.: MATH 650, MATH 688, MATH 827, and MATH 845 plus 21 credits of electives.

Other Requirements for the Ph.D.

Preliminary Exam: Offered before the beginning of each semester, this written examination covers material from MATH 600 and MATH 602 (Advanced calculus) and MATH 672 (Linear algebra). Students entering with Bachelor's degrees are required to pass the Preliminary Examination by the beginning of their 4th semester (by the beginning of their 2nd semester for students entering with Master's degrees). Students who do not meet this requirement are recommended for dismissal.

Candidacy Exam: This written examination is administered in February. A student entering with a Bachelor's degree must pass the Candidacy Exam by the beginning of his/her 6th semester of study (by the 4th semester of study for those entering with a Master's degree). A second and final attempt is permitted in the following August. 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 and Discrete Mathematics. The exams are based on MATH 650 and MATH 845 (Algebra), two chosen from MATH 805, MATH 806 and MATH 807 (Analysis), MATH 616, MATH 617 and MATH 810 (Applied Mathematics) and MATH 688 and MATH 689 (Discrete Mathematics). 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.

Language Requirement: The department requires the Ph.D. candidate to have reading knowledge of one of four languages: French, German, Italian or Russian. Substitutions may be allowed upon petition.

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.

MUSEUM STUDIES

Telephone: (302) 831-1251

The program offers courses in the history, philosophy and functions, leadership and management, curatorship, educational offerings, interpretive programs, exhibitions and public dimension of

institutions that collect, preserve, study, and disseminate information about our cultural heritage. A certificate in Museum Studies may be earned in conjunction with a graduate degree in history, art history, art, early American culture, public horticulture, business administration, liberal studies, and other fields appropriate for students planning careers in history, art, natural history, science and technology, and other kinds of museums. Students are admitted who are accepted for graduate work in joint programs of the University and the Hagley Museum, Longwood Gardens, and the Winterthur Museum, as well as students enrolled in associated University departments.

Students wishing to enroll in Museum Studies should apply for admission to the University Office of Graduate Studies indicating the graduate degree program of their choice.

MUSIC

Telephone: (302) 831-2577

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 two concentrations: Performance (emphasizing studio instruction or conducting, and culminating in a public recital) and Teaching (directed towards music educators in grades K-12 who desire a master's degree in this discipline).

RESEARCH FACILITIES

Music study is enriched by the well-equipped and modern facilities in the Amy E. du Pont Music Building, with its large rehearsal rooms, ample practice rooms and Loudis Recital Hall. 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 study scores and chamber music, as well as a fine collection of audio and video recordings. The building also houses extensive electronic equipment to support the work in computer and video-disc technology which has earned the department international acclaim.

REQUIREMENTS FOR ADMISSION

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 department's Committee on Graduate Studies, revealing an acceptable grade-point average (normally 3.0). Finally, the student must provide the Coordinator of Graduate Studies with a statement of professional goals and three letters of recommendation. Students applying for admission to the Performance Concentration must pass an audition.

Applicants must also perform satisfactorily on the department's music theory and music history placement tests prior to enrolling in MUSC 695 (Advanced Analytical Techniques) or MUSC 611 (Studies in Music History). Any and all deficiencies indicated must be corrected before the student may enroll in these courses. This may be accomplished through enrollment in one or more existing undergraduate music theory or literature courses or through a program of self-study, tutoring, or laboratory work. The department's Coordinator of Graduate Studies will prescribe remedial

action, if any, appropriate for each person. The student will be required to retake and pass the portions of the placement exams in which deficiencies were found before enrolling in the above-mentioned courses.

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's Coordinator of Graduate Studies for information. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREE

I. Performance Concentration

Courses

Students are required to complete 33 credit hours (maintaining a grade average of B or better) to be granted the degree Master of Music: Performance. All students take the following:

- MUSC 601 Master's Recital (2 cr.)
- MUSC 603 Chamber Music Literature (3 cr.)
- MUSC 611 Studies in Music History (3 cr.)
- MUSC 620 Large Ensemble (1 cr.)
- MUSC 621 Chamber Ensemble (1 cr.)
- MUSC 622 Materials and Methods of Research (3 cr.)
- MUSC 661 Advanced Private Study (4 cr.)
- MUSC 662 Advanced Private Study (4 cr.)
- MUSC 681 Pedagogy and Literature (3 cr.)
- MUSC 695 Advanced Analytical Techniques (3 cr.)

Students will elect one of the following:

- MUSC 605 Symphonic Literature (3 cr.)
- MUSC 663 Advanced Keyboard Literature (3 cr.)

There is one elective in the program, which may be taken from among Music Department offerings or elsewhere in the University with the approval of the student's advisor (3 cr.)

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. Teaching Concentration

Courses

Students are required to complete 30-31 credit hours (maintaining a grade 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 cr.)
- MUSC 622 Materials and Methods of Research (3 cr.)
- MUSC 695 Advanced Analytical Techniques (3 cr.)

Music Education Courses (6 cr.)

- MUSC 640 Philosophical Issues in Music Education (3)
- MUSC 676 Seminar in Music Education (3)

Specialization Component (3-4 credits)

Students can elect one of three areas of specialization: Choral Conducting, Instrumental Conducting, or General Music K-12. The courses for each are as follows:

Choral Conducting

- MUSC 636 Advanced Choral Conducting (3)
 MUSC 638 Large Ensemble Practicum (1)
 (Large Ensemble to be chosen with the approval of the faculty advisor)

OR**Instrumental Conducting**

- MUSC 637 Advanced Instrumental Conducting (3)
 MUSC 638 Large Ensemble Practicum (1)
 (Large Ensemble to be chosen with the approval of the faculty advisor)

OR**General Music K-12**

- MUSC 675 General Music K-12 (3)

Thesis or Project (6 credits)

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 Improvement Project I (3)
 MUSC 680 Professional Improvement 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.

NEUROSCIENCE

Telephone: (302) 831-3311

The Graduate Program in Neuroscience is an interdisciplinary program leading to the Ph.D. in a traditional academic discipline (Biological Sciences or Psychology) and in Neuroscience. Faculty who participate in the Neuroscience Program are from the Departments of Biological Sciences, Psychology, Physical Therapy, and Electrical and Computer Engineering. Research areas explored by these faculty range from molecular neuroscience to behavioral neuroscience. The goal of the program is to ensure that students are expert in their specialty in neuroscience as well as conversant with the broad range of multidisciplinary neuroscience.

In close apprenticeship relationships with research advisers and other faculty in the program, students are trained to master multidisciplinary techniques in order to address the current issues in neuroscience. The research of each student in the program is supervised by a committee that is chaired by the student's research adviser and includes faculty from the academic units that participate in the Neuroscience Program.

Neuroscientists at the pharmaceutical laboratories of The DuPont Company, DuPont-Merck, and AstraZeneca in Wilmington, Delaware, and at the U.S. government laboratories in Aberdeen, Maryland work closely with University faculty in the training of graduate students. Through these experiences, students are exposed to the research environments of industrial and governmental laboratories.

REQUIREMENTS FOR ADMISSION

Students with interest and background in the interdisciplinary aspects of neuroscience should apply to the University through one of the two participating academic units (Departments of Psychology or Biological Sciences). Students must meet the admission requirements of the academic unit to which they apply before they may be considered for admission to the Graduate Program in Neuroscience. Students are encouraged to consult with any of the participating faculty, or with the Director of the Neuroscience Program for additional information relating to the neurosciences. Students may also apply to the Program in Neuroscience after matriculation into one of the participating academic units.

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 must satisfy the degree requirements of the participating academic unit into which they have been accepted. In addition, to gain competence and breadth in the major areas of neuroscience, students must take four core courses in the neuroscience curriculum, one year of statistics, and pass a qualifying examination in neuroscience. The core courses in the program are neuroanatomy, cellular neurophysiology, neuropharmacology, and integrative neurophysiology.

PHYSICAL THERAPY

Telephone: (302) 831-8910

The Physical Therapy Department offers a Master of Physical Therapy (M.P.T.) degree program. This is an entry-level degree which will qualify the graduate to sit for the physical therapy licensure examination in any state in the country. The program is accredited by the Commission on Accreditation in Physical Therapy Education.

The Physical Therapy Department is housed in McKinly Laboratory and has modern well-equipped laboratories for research, teaching, and clinical practice. In addition, there is a physical therapy practice clinic which is staffed by students who are supervised by faculty members. All students are required to register for the practice clinic at least once during the degree program.

REQUIREMENTS FOR ADMISSION

The minimum requirements for the MPT program are:

- a bachelor's degree from an accredited institution
- documented volunteer or paid clinical experience in physical therapy (200 hours)
- three letters of recommendation
- Graduate Record Examination Verbal and Quantitative scores
- if requested, an interview with the admissions committee

Admission to the M.P.T. program requires demonstrated academic excellence, evidence of physical therapy clinical experience, and the following (or equivalent): two years of biological sciences, including physiology and anatomy; one year of inorganic chemistry; calculus; one year of physics; one year of psychology; one semester of English; and one semester of statistics. All course work must be completed prior to beginning the professional program.

Application is made to the University's Office of Graduate Studies. In addition, three letters of recommendation from persons

able to judge the applicant's ability to pursue physical therapy graduate study should be sent to the Chair of the Physical Therapy Department. Two of these letters should be from licensed physical therapists who have observed the applicant in a clinical environment. Application deadline is January 16.

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

The M.P.T. program requires 69 hours of graduate course work. These hours are in such areas as didactic instruction, experiential laboratories, research, clinical internships, or other equivalent academic experiences. Clinical internships comprise 15 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 years duration, including summers. Part-time matriculation is not typically permitted. A thesis option is available for students interested in pursuing research.

MASTER OF PHYSICAL THERAPY CURRICULUM

GRADUATE YEAR 1		CR
Summer		
PHYT 600	PT as a Profession	1
	(Second Summer Session)	
PHYT 622	Clinical Gross Anatomy	6
	(Second Summer Session)	
		7
Fall		
PHYT 801	Medical Science I	2
PHYT 604	Functional Anatomy	3
PHYT 602	Patient Management I	3
PHYT 603	Physical Agents	2
PHYT 624	Introduction to Evaluation Techniques	1
PHYT 606	Research	3
		14
Winter		
PHYT 605	Clinical Internship	3
Spring		
PHYT 601	Exercise Physiology	3
PHYT 623	Clinical Neuroscience	4
PHYT 607	Electrotherapy	3
PHYT 620	Educational Process in Community Health	1
		11
GRADUATE YEAR 2		CR
Summer		
PHYT 608	Musculoskeletal Evaluation	3
	(First Summer Session)	
PHYT 802	Medical Science II	2
	(First Summer Session)	
PHYT 605	Clinical Internship	3
	(Second Summer Session)	
		8
Fall		
PHYT 609	Neurophysiologic Evaluation	3
PHYT 611	Clinical Management	1
PHYT 617	Patient Management II	3

PHYT 618	Life Span Development	3
PHYT 803	Medical Science II	2
PHYT 610	Psychosocial Aspects	2
		14

Winter

PHYT 619	Advanced Seminar	2
		2

Optional Electives-Hours do not count towards total required hours for degree.

Maximum of two electives. (6)

Spring

PHYT 605	Clinical Internship	6
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Note: PHYT 621 Practice Clinic (1 cr) must be taken at least once during the degree program. 1

Summer

PHYT 605	Clinical Internship	3
	(First Summer Session)	

Total Hours **69**

Note: The curriculum is subject to modification as needed.

PHYSICS AND ASTRONOMY AND THE BARTOL RESEARCH INSTITUTE

Physics Telephone: (302) 831-2661 or 831-2662

Bartol Telephone: (302) 831-8111

The Department of Physics and Astronomy and the Bartol Research Institute offer joint graduate programs leading to the M.A., M.S., and Ph.D. degrees. The Department and Institute are located in Sharp Laboratory, which houses a physics library, research and teaching laboratories, a fully equipped and staffed machine shop, and electronics shop. Ample computing facilities are available, including access to the Internet and national supercomputing centers.

The Joint Graduate Program is well equipped for experimental research in condensed matter and materials physics, acoustics, atomic and molecular physics, and biophysics. Research facilities include a high pressure laboratory, electron microscopy and x-ray diffraction laboratories, specialized laser facilities, and a 2.3 MV Van de Graaff accelerator used for PIXE and other analytical studies of materials and thin films. In addition, numerous facilities are available for the preparation and study of structural, thermal, transport, optical, acoustic, and magnetic properties of solids and liquids.

Experimental and observational research opportunities in astronomy and astrophysics are available through the Joint Graduate Program. Space science research is supported through a number of in-situ NASA satellite experiments such as the Voyager Interstellar Mission, the Mars Global Surveyor (MGS), Advanced Composition Explorer (ACE), WIND spacecraft in The Global Geospace Project and SOHO (Solar and Heliospheric Observatory), as well as a program of high altitude balloon flights.

Research in observational astrophysics includes use of the NASA great observatories, the VLA radio telescope in New Mexico, and ground based and underground cosmic ray laboratories around the world. Bartol operates 2 neutron monitors, a millimeter telescope, a cosmic ray air shower experiment and a solar observatory in Antarctica. The Mt. Cuba Astronomical Observatory is associated with the University of Delaware and makes a 24-inch Cassegrain telescope available for observational research. The Bartol Research Institute leads a consortium of 9 regional institutions of higher learning which are part of the National Space Grant College Program.

Theoretical research is an essential part of the Joint Graduate Program. Opportunities are available in condensed matter and materials physics, particle physics, cosmology, atomic and molecular physics, astrophysics, space physics, plasma physics, and nuclear physics. Many of these theoretical activities involve a close working relationship with related experimental programs. Extensive numerical modeling is done both locally and at national supercomputing laboratories.

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. A minimum undergraduate grade point average of 3.2 or its equivalent is recommended for admission. In addition, scores for the Graduate Record Exam (GRE), Verbal, Quantitative and Analytic, and the GRE Physics Subject Test are required. A complete official transcript or equivalent certified written record of academic work to date is also essential. This should list the courses taken and the individual grades awarded. At least three letters of reference should be sent independently by professors or others who are familiar with the applicant's academic work. For students whose first language is not English, the Test of English as a Foreign Language (TOEFL) is required. For financial support, a TOEFL score exceeding 600 is required. Of the reference letters, at least one should be from someone familiar with graduate study in the U.S.A. and at least one should address the applicant's English speaking ability.

FINANCIAL AID

Financial aid is available to graduate students in the form of teaching assistantships, research fellowships, and University fellowships. Inquiry regarding these appointments may be made when applying for admission. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREES

The M.A. degree program requires 30 credit hours of graduate level formal course work, at least 24 of which are taken in PHYS. The course work will not be accomplished merely by accretion of scattered credits, but will be methodically planned in consultation with the student's faculty advisor. In appropriate circumstances a project entered under PHYS 868 could be submitted for as many as 3 of the credits of formal course work. Because it requires neither research nor a thesis, the M.A. degree can be completed more rapidly than the M.S. degree and may be the more suitable for students able to attend only on a part-time basis. But the M.A. degree is viewed as a terminal degree, and its recipients will not normally be considered for candidacy in the M.S. or Ph.D. programs in Physics.

Twenty-four credit hours of course work are required for the M.S. degree; at least 6 must be in 800-level courses in physics. In addition, 6 credit hours of thesis (PHYS 869) must be completed. Approval of the department review committee is required if more than 6 of these 24 are from departments other than physics or if any are in a discipline unrelated to physics. After the M.S. thesis is completed, the candidate defends the thesis in an oral examination administered by the thesis committee.

Prospective Ph.D. candidates are frequently chosen from among those who have successfully completed a master's degree program either at Delaware or elsewhere. However, a physics graduate student may bypass the M.S. degree by:

1. Taking and passing the preliminary and qualifying examinations within two years of entering graduate work (two and one-half years for students admitted in January), and
2. Taking and passing, with a grade of B (3.000) or better, 30 credits of course work within the first five semesters after entering graduate work. At least 21 of these credit hours must be from among PHYS 607/8, and 800-level physics courses.

A student entering the department with a master's degree must either:

1. Take at least 12 credit hours of course work during the first year, including 6 at the 800 level, and take the qualifying exam within one year, and pass it within two years;
- or
- 2) Satisfy the bypass option mentioned above.

All Ph.D. students must take a minimum of 12 credit hours of classroom course work beyond the core curriculum. These courses must be at or above the 600 level and be in physics or physics-related areas.

The preliminary exam based on several general physics texts is given twice a year in September and February. It must be taken by all students immediately after entry into the program and passed before the beginning of their second semester.

The qualifying examination, which is based on a core of graduate-level courses, is given twice per year, in late August and in early February. The Ph.D. candidate must pass this examination within three and a half years after arriving at Delaware. Most students take the examination for the first time at the end of their second year.

Upon successful completion of a research program, the candidate is required to pass a final oral examination that includes the defense of the dissertation and discussion of relevant material. Progress of a student through the graduate program is reviewed regularly by a departmental review committee.

The research content of the M.S. and Ph.D. program can be chosen from among current faculty research activities within astronomy, astrophysics, atomic and molecular physics, biophysics, condensed matter and materials physics, cosmic ray physics, nuclear and elementary particle physics, and solar and space physics. More detailed information on research areas and facilities is contained in a departmental brochure available upon request.

POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Telephone: (302) 831-2355

The Department of Political Science and International Relations offers three graduate degree programs: M.A. and Ph.D. in political science and M.A. in international relations. Political Science fields of specialization include American Politics and Institutions, Comparative Politics, International Politics, Law and Courts, Political Philosophy and Public Administration and Public Policy. The department also participates in the Master of Public Administration degree in conjunction with the College of Urban Affairs and Public Policy.

The master's program offers advanced study in political science for students interested in later pursuing Ph.D. studies, entering government service, or other careers.

The Ph.D. program provides opportunities for the development of research and teaching skills necessary for careers in education or public service.

REQUIREMENTS FOR ADMISSION

To be accepted into the program students are evaluated on several criteria.

For the Ph.D.:

- Performance on GRE aptitude test (normally 1700 for the 3 combined 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).

For the M.A.:

- Performance on GRE aptitude test (normally 1500-1600 for the 3 combined aptitude scores).
- Undergraduate grade-point averages (normally a 3.0 overall and 3.2 in major field).
- Three letters of recommendation.
- For international students, a TOEFL score (normally at least 600).

Utilizing all of these variables, the department attempts to predict the candidate's success (e.g., low GRE scores could be balanced by high grades and very strong recommendations). Applicants are encouraged to submit examples of written work.

In addition, admission to the graduate program is affected by the number of well-qualified applicants and the limits of available faculty. Those who meet stated minimum academic requirements are not guaranteed admission.

REQUIREMENTS FOR THE DEGREES

The program of study is divided into six fields: political theory, public policy and administration, comparative government, international relations, law and courts, and American government. Students may complete the M.A. degree through either a 1-year or 2-year program, and may complete the Ph.D. in four to five years. The relatively small size of both the M.A. and Ph.D. programs insures individualization of students' degree plans and encourages faculty-student cooperation in areas of special interest. Financial aid is available. Applicants are also eligible to compete for university-wide fellowships.

The M.A. in Political Science program requirements are the following: 30 credits of course work including POSC 800 Seminar: Philosophy of Political Inquiry; POSC 801 Research Design; seminars in three of the six fields offered by the department; and a comprehensive examination in one field. A research requirement may be met through an M.A. thesis (6 credit hours) or a major seminar research paper.

The M.A. in International Relations requires 30 credits of course work including POSC 800 Seminar: Philosophy of Political Inquiry, POSC 830 Seminar: International Relations, POSC 810 Seminar: Comparative Politics, POSC 840 International Political Economy, and one seminar selected from POSC 803 Public Administration, POSC 808 American Political Institutions, POSC 833 Normative Political Theory, POSC 838 Public Policy Analysis, or POSC 805 Seminar: Public Law, a comprehensive examination in international relations, and competency in one language in addition to English. A thesis (6 credits) is also required.

The Ph.D. program requires POSC 800 Seminar: Philosophy of Political Inquiry, POSC 801 Research Design, knowledge of one foreign language, competence in social science statistics, 60 credit hours (or an M.A. plus thirty additional credits), comprehensive examinations in three fields, and a Ph.D. dissertation.

PSYCHOLOGY

Telephone: (302) 831-2271

The Department of Psychology offers a doctoral degree program in psychology, with specialization in the areas of social psychology, cog-

nitive psychology, biological psychology, 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 research workers 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 information processing, child development, electrophysiology, pharmacological and physiological bases of animal behavior, psychophysiology, small group behavior, interpersonal communication, psycholinguistics and visual processing. 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, a complete photography set-up, and an electronics and carpentry shop. 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 the chapter "Graduate Fellowships and Assistantships" in this catalog 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. The Master's Degree is optional.

Successful completion of the second year project, the qualifying exam, and the dissertation proposal are necessary for admission to candidacy for the Ph.D. Progress toward the Ph.D. is achieved through completion of advanced work, dissertation research, and a clinical practicum and internship for students in the clinical area.

SOCIOLOGY AND CRIMINAL JUSTICE

Telephone: (302) 831-2581

The Department of Sociology and Criminal Justice offers a Master of Arts and a Doctor of Philosophy degree program in both sociology and criminology. Students may develop specializations in any of the following areas: social theory, research methods, urban sociology, sociology of sex and gender, sociology of law, organizations, and deviance. The graduate program is oriented toward providing students with professional training for a variety of academic and research careers in sociology or criminology. Career objectives may include employment in industry, governmental agencies, research, or college and university teaching.

RESEARCH CENTERS

The Department of Sociology and Criminal Justice sponsors two research centers. The Disaster Research Center conducts international and national studies of disasters and the Center for Drug and Alcohol Studies conducts research on drug and alcohol abuse. Both receive federal funding and offer research assistantships to graduate students.

REQUIREMENTS FOR ADMISSION

Applicants should submit transcripts of all academic work, Graduate Record Examination scores, and three letters of recommendation. Applications for fall admission should be completed by March 1. Students applying for financial aid for fall admission must complete applications by 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 and research assistantships are available to graduate students at the M.A. and Ph.D. levels. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREES

Students are required to complete 30 credit hours for the **Master of Arts degree in sociology**. The courses required are as follows:

- SOCI 605 Data Collection (3 credits)
- SOCI 612 Foundations of Sociological Theory (3 credits)
- EDST 861 Introduction to Statistical Inference (3 credits)

In addition, one course must be taken from any two of the following three areas: deviance, social stratification, and organization. The remainder are selected in consultation with an advisor. Students may satisfy the requirement by completing 30 credits of course work and preparation of written examination, by completing 24 credits of course work and preparation of a thesis (6 credits), or by completing 24 credits of course work and an internship. The internship M.A. is intended for students who do not plan to go on for the Ph.D. degree.

For the **Master of Arts in Criminology degree** students must take 30 credits plus comprehensive examinations in Criminology and Theory or Methods, 24 credits plus a thesis, or 24 credits plus an internship. The courses required are as follows:

- SOCI 605 Data Collection (3 credits)
- SOCI 612 Foundations of Sociological Theory (3 credits)

- EDST 861 Introduction to Statistical Inference (3 credits)
- SOCI 835 Criminal and Delinquent Behavior (3 credits)

In addition, three courses (9 credits) must be taken from offerings in the areas of Criminal and Delinquent Behavior and Criminal Justice and Legal Systems.

For the **doctoral degree in sociology** the requirements are a minimum of 12 credit hours in substantive sociology courses, one year in residence, 9 dissertation hours, the four courses required for the Master of Arts course requirement, and:

- SOCI 813 Current Issues in Social Theory (3 credits)
- EDST 845 Regression Models in Education (3 credits)

And one of the following:

- SOCI 606 Advanced Data Collection (3 credits)
- SOCI 611 Techniques of Demographic Analysis (3 credits)
- SOCI 614 Data Analysis (3 Credits)

Students must also successfully complete written comprehensive examinations in two substantive areas and are expected to complete a dissertation representing an original contribution to the sociological literature.

For the **doctoral degree in criminology**, the following courses are required in addition to the Master of Arts requirements:

- SOCI 813 Current Issues in Social Theory (3 credits)
- EDST 845 Regression Models in Education (3 credits)
- SOCI 836 Seminar in Criminal and Delinquent Behavior (3 credits)

And one of the following:

- SOCI 606 Qualitative Methods (3 credits)
- SOCI 611 Techniques of Demographic Analysis (3 credits)
- SOCI 614 Data Analysis (3 credits)

and at least 15 credits from among the offerings in Criminal and Deviant Behavior, Criminal Justice and Legal Systems and related courses.

Students must also complete two written comprehensive examinations, one in Criminology and one in another standing area, and are expected to complete a dissertation.

THEATRE

Telephone: (302) 831-2201

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 Studies 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 \$40 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).

FINANCIAL AID

The PTPP offers a variety of financial awards ranging from full fellowships to partial tuition scholarships. All awards are based on merit. Fellowship and tuition scholarships 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. 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.

YEAR 1: Students enroll in the following courses during year #1.

	Crs.
THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	6
(3 credits each semester)	
THEA 665 Theatre Literacy (2 credits each semester)	4
Total Year #1	22

YEAR 2: Students enroll in the following courses during year #2.

THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	6
(3 credits each semester)	
THEA 665 Theatre Literacy (2 credits each semester)	4
Total Year #2	20

YEAR 3: Students enroll in the following courses during year #3.

THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	10
(5 credits each semester)	
Total Year #3	20

TOTAL GRADUATION CREDITS **62**

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.

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 633	Stage Management Organizational & Managerial Techniques IA (2 credits fall)	2
THEA 634	Stage Management Organizational & Managerial Techniques IB (1 credit spring)	1
THEA 639	Stage Management Production Skills IA (2 credits fall)	2
THEA 640	Stage Management Production Skills IB (2 credits spring)	2
THEA 645	Rehearsal & Performance/Stage Management (1 credit fall; 2 credits spring)	3
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 680	Lighting Production (1 credit fall)	1
THEA 681	Audio Production (1 credit spring)	1
THEA 693	Production Coordination (1 credit each semester)	2

Total Year #1 22

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 635	Stage Management Organizational & Managerial Techniques IIA (2 credits spring)	2
THEA 641	Stage Management Production Skills IIA (2 credits fall)	2
THEA 645	Rehearsal & Performance/Stage Management (3 credits each semester)	6
THEA 648	Costume Construction (1 credit spring)	1
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 674	Scenery Production (1 credit fall)	1
THEA 675	Properties Production (1 credit spring)	1

Total Year #2 21

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 636	Stage Management Organizational & Managerial Techniques IIB (1 credit spring)	1
THEA 642	Stage Management Production Skills IIB (1 credit fall)	1
THEA 645	Rehearsal & Performance/Stage Management (4 credits each semester)	8
THEA 694	Special Topics in Theatre Production (2 credit each semester)	4

Total Year #3 18

TOTAL GRADUATION CREDITS 61

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 drafting (manual and CAD), properties construction, audio production, scenic painting, stage carpentry, stage electronics, 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.

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 674	Scenery Production (1 credit fall)	1
THEA 675	Properties Production (1 credit spring)	1
THEA 680	Lighting Production (1 credit fall)	1
THEA 681	Audio Production (1 credit spring)	1
THEA 686	Information Technologies for Theatre (1 credit fall)	1
THEA 687	Scenery Painting (1 credit spring)	1
THEA 688	CAD & Scenery Construction (1 credit spring)	1
THEA 692	Production & Performance/Technical (1 credit fall, 2 credits spring)	3
THEA 693	Production Coordination (1 credit each semester)	2

Total Year #1 20

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 639	Stage Management Production Skills IA (1 credit spring)	1
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 676	Scenery: Metalworking (1 credit fall)	1
THEA 677	Properties: Upholstery & Draping (1 credit fall)	1
THEA 678	Properties: Casting & Mold-making (1 credit spring)	1
THEA 679	Scenery: Stage Rigging (1 credit spring)	1
THEA 682	Lighting Design (1 credit spring)	1
THEA 689	Advanced Scene Painting (1 credit fall)	1
THEA 690	Advanced CAD (1 credit fall)	1
THEA 692	Production & Performance/Technical (3 credits each semester)	6

Total Year #2 22

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 692	Production Preparation & Performance/Technical (4 credits each semester)	8
THEA 694	Special Topics in Theatre Production (3 credits each semester)	6

Total Year #3 18

TOTAL GRADUATION CREDITS 60

WINTERTHUR PROGRAM IN EARLY AMERICAN CULTURE

Telephone: (302) 831-2678

The Winterthur Program in Early American 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 Henry Francis du Pont Winterthur Museum 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 directly to the Winterthur Program in Early American Culture 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 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 full tuition and an annual stipend. Application for the program and these fellowships can only be made by applying to the program through the Director's office, 304 Old College. 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, and 19th centuries. Extracurricular activities 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 chosen from art history, history, and English. In addition to traditional courses, these departments also embrace such fields as folklore, vernacular architecture, and media study.

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 Early American Culture.

examinations must be passed, as well as a final dissertation defense. The program is to be completed within five years, including a minimum of one year in residence.

Some fellowship support is available in honor of Dr. Paul Coremans, founder of the Institut Royal du Patrimoine Artistique in Belgium and facilitator of the type of interdisciplinary research in conservation expected of students in the Ph.D. program.

ART HISTORY

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

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 strength on the graduate level 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. 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 slide collection, the Decimal Index of the Art of the Netherlands, the "Illustrated Bartsch," the Wayne Andrews photographic archive of American architecture, a cumulative index of dissertations and theses in American art, and a photographic Index of American Sculpture. 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 M.A. 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 Human Resources, Education and Public Policy, CHAD is cosponsored by the departments of Art History, History, and Geography, the College of Engineering, and the Museum Studies Program, American 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 Winterthur Museum Library, open to graduate students in art history, is especially strong in American art and in sources of design and both social history and British artistic backgrounds. 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 Studies by January 15. Students requesting fellowships or assistantships beginning in the fall semester must have their completed applications in the Office of Graduate Studies prior to January 15. See also the chapter "Graduate Admissions" in this catalog.

Admission to the graduate program in Art History is an academic judgment matter. Students are admitted 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 the chapter "Graduate Fellowships and Assistantships" in this catalog.

REQUIREMENTS FOR THE DEGREES

Requirements for the Master of Arts degree consist of a minimum of 24 hours of course work, a master's thesis (research essay), and a language examination (either French, German, or Italian). Individual programs will be arranged according to each student's needs in consultation with a faculty adviser. With the adviser's consent, students may substitute a limited number of courses in such related fields as anthropology, American studies, history, literature, urban affairs, and philosophy. Normally, the degree requirements may be completed in two years of full-time study.

Students will normally complete the M.A. degree before applying for candidacy to the Ph.D. program. Students who are accepted with an M.A. degree from an accredited art history program may enter the Ph.D. program directly. One major field and one minor field, in which students will be examined after completing 24 hours of course work, will be chosen from the following areas: Ancient, Medieval, Italian Renaissance, Northern Renaissance, Seventeenth and Eighteenth Century, Nineteenth and Twentieth Century, and American, with additional minors available in the History of Photography, Decorative Arts, Graphic Arts, History of Book Illumination, and History of Architecture. Upon petition, minor fields may be tailored to the student's special interests. Candidates for the Ph.D. must pass written examinations in German and either French or Italian. Candidates then produce a dissertation, which is defended in an oral examination.

RELATION TO THE M.A. IN EARLY AMERICAN CULTURE

At the University of Delaware, there are two avenues to the historical study of the visual arts: (1) The M.A. and Ph.D. program in the Department of Art History; and (2) the M.A. in Early American 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 Early American 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 Ph.D. level especially encouraged.

At the Ph.D. 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

Telephone: (302) 831-6977

Master of Science and Doctor of Philosophy degrees are offered in the fields of ecology, genetics and molecular biology, microbiology, neurobiology, and physiology-anatomy. Admission to the graduate program in biological sciences requires demonstrated academic excellence and the following (or the equivalent): three years of biological sciences (two years for students with undergraduate majors in other than the life sciences); one year of mathematics, preferably to include calculus and/or statistics; one year of college physics; one year of inorganic 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.

The Department of Biological Sciences has modern well-equipped laboratories for research and teaching in physiology, microbiology, the neurosciences, ecology, genetics, and developmental, organismic, cellular, and molecular biology. Facilities include electronic instrumentation, ultra-centrifuges, liquid scintillation and gamma spectrometers, fluorescent microscopes and spectrophotometers, constant temperature rooms and growth chambers, extensive animal research facilities, and scanning and transmission electron microscopes with attendant equipment. Computer facilities with access to mainframe sequence analysis and image analysis (IRIS and SUN workstations) are also available. In addition to Wolf Hall, the Department occupies much of the McKinly Laboratory Building.

REQUIREMENTS FOR ADMISSION

Admission to the Biological Sciences graduate program is competitive and based upon assessment of an applicant's overall strengths and aptitude to perform well in the chosen area of research interest. Applicants must meet the graduate admission requirements of the department, including a scholastic index of 2.8 overall and 3.0 in the sciences. Graduate Record Examination Aptitude and Advanced Biology Test scores are required. Competitive scores are approximately 550 (Verbal), 650 (Quantitative), 650 (Advanced Biology). Application is made to the University's Office of Graduate Studies. In addition, three letters of recommendation from persons able to judge the applicant's ability to pursue graduate study should be sent to the Chair, Department of Biological Sciences. See also the chapter in "Graduate Admissions" in this catalog.

FINANCIAL AID

Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog.

REQUIREMENTS FOR THE DEGREES

The Master of Science program requires 24 hours of courses, 6 hours of thesis and successful completion of the preliminary examination,

administered after the first year. Primary emphasis is on research that culminates in the thesis. A written research-based thesis and the oral defense of it are required.

For the Ph.D. degree, successful completion of the preliminary and qualifying examinations as well as the presentation and defense of a written research proposal and dissertation are required. The Ph.D. requires 30 credit hours including 9 hours of dissertation. The preliminary examination is administered after two semesters of study and is designed to identify the student's strengths and weaknesses and suitability for further graduate study. The qualifying examination is an in-depth examination of the student's research specialty and is administered after six semesters. Formal courses should be completed as soon as possible to allow time for independent study and research. Experience in the teaching of undergraduates is required of all candidates. It is expected that a significant portion of the dissertation will be suitable for publication.

CHEMISTRY AND BIOCHEMISTRY

Telephone: (302) 831-1247

The Department of Chemistry and Biochemistry offers programs leading to the Ph.D., M.S., and M.A. degrees. Financial support for Ph.D. 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 biology, engineering, mathematics, and physics 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 adviser. A reading knowledge of a modern foreign language is required for some areas for the Ph.D.

Three major facilities support the research of faculty and students. These laboratories are operated by Ph.D.-level scientists who provide analytical service and training courses. The Blue Hen NMR Complex houses five 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 six 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 and LC/MS instruments are available for routine student use. The X-ray laboratory includes two state-of-the-art diffractometers for small molecule crystallography. 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

Apart from the generally stated University requirements, all students are expected to fulfill a set of proficiency requirements upon entering the program. The M.A., M.S., and Ph.D. degrees require at least eighteen credits in graduate level courses (600-level or higher) excluding research and/or dissertation. At least nine coursework credits must be taken outside the student's area of concentration. Scientific courses at the 600-level or higher offered by other departments may be included in the coursework requirement if approved by the Chemistry and Biochemistry Department. The M.A. and Ph.D. degrees require successful completion of a series of cumulative examinations. The M.S. and Ph.D. degrees require a thesis based on original research. The M.S. degree requires a minimum of six and a maximum of twelve credit hours of thesis and/or research. The Ph.D. degree requires a final public oral defense of the dissertation. Some areas of concentration require successful completion of a Language Examination. Courses that are normally required for specific areas of concentration are as follows:

Analytical.....	CHEM 620, CHEM 621, CHEM 622, CHEM 623, CHEM 624, CHEM 625, CHEM 626, CHEM 627, CHEM 820
Biochemistry.....	CHEM 641, CHEM 642
Inorganic.....	CHEM 651, CHEM 652, CHEM 654
Organic.....	CHEM 633, CHEM 634, two additional courses with CHEM 63x or CHEM 83x designation.
Physical.....	CHEM 671, CHEM 672, CHEM 674, CHEM 677

Specific details of the requirements for the advanced degrees in chemistry may be obtained by requesting them directly from the Chemistry and Biochemistry Department.

COMMUNICATION

Telephone: (302) 831-8041

The Department of Communication offers a program leading to a Master of Arts degree in communication. A student may elect to pursue a general graduate communication degree or may specialize within one of the department's areas of study: organizational communication, mass communication, or interpersonal communication. The program is designed to produce competent consumers of empirical research and theory in preparation for Ph.D. studies or for a career as a communication specialist if this is a terminal degree. The program is not broadcast or production oriented.

REQUIREMENTS FOR ADMISSION

To be considered for admission, all applicants are evaluated on the following criteria: (1) undergraduate academic work; both total GPA and major GPA are considered (a 3.0 in both categories is the generally accepted minimum); (2) GRE scores; TOEFL scores; applicants must obtain a minimum score of 550 on each section of the GRE; foreign students must have a minimum score of 600 on the TOEFL; (3) three letters of recommendation; and (4) 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. 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

A limited number of teaching assistantships are available and are awarded competitively in the spring of each year. The application deadline is March 1. 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

The program necessitates that full-time students begin the course of study in the fall semester. Thirty credit hours are required to complete the degree. Five courses (15 credits) are required. Three courses (9 credits) are required of all students: COMM 601, Theory and Epistemology of Communication; COMM 603, Research Methods-Procedures; and COMM 604, Research Methods-Analysis. The two remaining required courses (6 credits) are selected from three theoretical courses: COMM 670, Theory of Mass Communication; COMM 630, Theory of Interpersonal Communication; and COMM 610, Theory of Organizational Communication. Finally, the Master of Arts candidate may write a thesis or take a comprehensive examination on all course work. The student who elects to write a thesis must take 6 credits of COMM 869, Master's Thesis. Graduate courses are offered in organizational communication, communication theory, mass communication, public relations, and interpersonal communication. There are also opportunities for independent study and/or internships. There are no language requirements. Six graduate credits may be taken outside the Communication Department in a related area, if approved by the graduate student's committee.

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

COMPUTER AND INFORMATION SCIENCES

Telephone: (302) 831-2712

The Department of Computer and Information Sciences offers programs leading to the Ph.D. and M.S. degrees. Computer Science is a vigorous and relatively new field for research and study. 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 areas include artificial intelligence (knowledge-based and expert systems, natural-language processing, robotics, multiagent systems, planning and problem solving), computational theory (computational learning theory, design and analysis of algorithms, recursive function theory), compiler optimization and compilation for parallel machines, networks and parallel computing (distributed computing, formal protocol specification, local area networks, algorithm and architecture design for massive parallelism, networks management, performance modeling, simulation), graphics and image processing, rehabilitation engineering (augmentative communication, speech recognition and enhancement), software engineering (real-time software design), and symbolic mathematical computation (algebraic algorithms, parallelization, rewrite systems).

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 M.S. and Ph.D. programs is that the Ph.D. is designed to prepare students to conduct advanced research.

The primary goal of the graduate program is to train people to think within the rapidly changing discipline of computer and information sciences. Of course, achieving this primary goal necessitates achieving the secondary goals of conveying skills and knowledge useful in the discipline.

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:

1. The equivalent of a bachelor's degree at the University of Delaware. A minimum grade average of 3.0 in the major field of study and an overall cumulative index of 2.5 is required.
2. 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,
 - assembly language programming,
 - data structures,
 - computer architecture.
 - operating systems.

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.
3. Strong applicants lacking prerequisites may be 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.
 4. A minimum combined score of 1750 on the verbal, quantitative, and analytical parts of the Graduate Record Examination Aptitude Test.
 5. 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.
 6. For applicants whose first language is not English, and who have not received a degree at a U.S. college or university, a minimum TOEFL score of 550 for admission without financial aid is required by the University. For applicants who seek a teaching assistantship appointment, a TOEFL score of 600 is required. In addition, for applicants who have not graduated from an institution whose principle language of instruction is English, the Test of Spoken English is highly recommended.
 7. Three letters of recommendation from professors (preferably), employers, or others who are able to assess your potential for success in graduate studies.

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 M.S. degree, or up to five years for the Ph.D. 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 Ph.D. preliminary examination after no more than three semesters of study. Students entering with an M.S. degree in Computer and Information Sciences (or a related area) are expected to take and pass the Ph.D. 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 length of support. With regard to financial aid, Ph.D. 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 MASTER OF SCIENCE 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 Studies.

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 Ph.D. 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 — Core Areas:

- Hardware Systems
 - Computer Architecture (CISC 662)
 - Operating Systems (CISC 663)
 - Computer Networks (CISC 650)
 - Software Systems
 - Programming Languages (CISC 670)
 - Theory of Translators (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 core courses, including at least one in each of the three areas.
 3. A grade of B- or better is required in any four of the core courses taken.
 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 CISC 869, which are included in the thirty credits needed for the M.S. 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 write an M.S. thesis.

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 M.S. thesis **only if** the areas of study do not overlap, as approved by the CISC Graduate Committee. The M.S. thesis student must still satisfy all other Department requirements.

REQUIREMENTS FOR THE PH.D. 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 Ph.D. is an individualistic degree. As soon as possible in the program, each candidate should find a faculty member to act as adviser 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. Department General Requirements

The Department requires the following:

1. **Course Work.** Each candidate must complete all requirements of a University of Delaware M.S. 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 CISC 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 M.S. degree, and show the equivalent of the 30 credit M.S. degree offered by the CISC Department.
Each candidate is required to complete a major and minor field of study based on a minimum of 12 additional credits beyond the master's degree. These 12 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 and a minor area, a candidate will be required by the adviser to complete more than 12 credits.
2. **Research Ability.** Ph.D. 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 M.S. 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 CISC undergraduate major and in one year of full-time graduate study including the core areas of the M.S. program. The detailed composition of the preliminary exam, within the constraint of testing breadth of CISC 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 coming in with a Bachelor's degree should normally take it 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 three times.
4. **Advisory Committee.** Each candidate 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 CISC Department faculty. The committee chair is the faculty member in charge of the candidate's research and dissertation. At least two members represent the major field of study and one the area of minor study. At least one member must be from outside the CISC Department. The proposed advisory committee must be submitted to the Graduate Committee for approval. It must then be approved by the CISC 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 major area, minor area, and 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, research interests, and major and minor areas of study. The proposal and plan are submitted to the advisory committee and are considered as input to the qualifying examination. Copies of "Discussion on Ph.D. 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 Ph.D. 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.

ENGLISH

Telephone: (302) 831-2363

The Department of English offers programs leading to the M.A. (with concentrations in Literature and in Literature and Pedagogy) and the Ph.D. There is also a certificate program in Business and Technical Writing.

REQUIREMENTS FOR ADMISSION

An applicant for the M.A. 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 Quantitative tests and **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 Ph.D. program must first gain admission to the M.A. program. Students who distinguish themselves in the M.A. program are then given permission to enter the Ph.D. program.

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

The English Department recognizes the application deadlines of July 1 for the Fall semester and December 1 for the Spring semester, but the department encourages much earlier applications, especially for the Fall semester, and it requires a deadline of March 1 for anyone seeking a fellowship or teaching assistantship in the Fall semester. In recent years, during which the increasing number of applicants has made the competition for admission much more rigorous, most of the admissions for the Fall semester have been determined by April 15.

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

The Department of English funds students each year, reserving awards for first-year M.A. and Ph.D. students. Funded students are granted one of the following awards: a fellowship; a teaching, research, editorial, or administrative assistantship; an assistantship in the University Writing Center; or an internship in a university administrative office. 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. Teaching assistants who serve as research, editorial, or administrative assistants and those who teach in the Writing Center work 15-20 hours per week each semester, as do those who serve as interns in other university offices. Fellows have no teaching or other duties.

REQUIREMENTS FOR THE DEGREES

The M.A. in Literature is granted upon the completion of eight semester courses (24 credit hours), a demonstration of ability to work in a foreign language, and the writing of a thesis (ENGL 869, 6 credit hours). In lieu of a thesis, the candidate for the M.A. may complete two additional courses (6 credit hours), ordinarily at the 800 level.

For the M.A. in Literature and Pedagogy, students may elect up to half of their course work in pedagogy and may satisfy their language requirement by taking an additional course in the history of the English language. Candidates seeking state certification must also take student teaching.

The Certificate Program in Business and Technical Writing requires five courses in the Department and two electives to prepare participants for careers in a number of professional writing specialties.

The Ph.D. is granted when the following requirements have been met: (1) completing at least eight courses (24 credit hours) beyond those taken for the M.A.; (2) satisfying the residency requirement of full-time study in two consecutive semesters; (3) demonstrating an ability to work in a second foreign language or advanced ability in one foreign language; (4) passing oral Ph.D. Comprehensive Examinations; (5) passing an oral Ph.D. Qualifying Examination in an area of specialization; (6) writing a dissertation; (7) passing an oral examination on the dissertation and related topics.

FOREIGN LANGUAGES AND LITERATURES

Telephone: (302) 831-2591/2592

The department offers two Master of Arts programs, the M.A. in Foreign Languages and Literatures and the M.A. 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. Secondary school teachers can participate in the Summer Institute for Foreign Language Teachers.

M.A. 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:

- 1) B.A. or equivalent in the target language/literature, or in another appropriate discipline.
- 2) Undergraduate Grade Point Average of 2.75 overall, and 3.25 in the proposed M.A. major subject.
- 3) GRE General Test for all students.
- 4) TOEFL for international students (550 minimum for admission to the program; 600 minimum for teaching assistantship).
- 5) Three letters of recommendation.

Admission to the M.A. 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 language and literature.

Candidates must pass a written and oral comprehensive examination based on reading lists in the major literature, as well as a reading competency examination in a second foreign language.

M.A. 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.

Requirements for Admission

The requirements for admission are:

- 1) B.A. or equivalent in the target language/literature, or in another appropriate discipline.
- 2) Undergraduate Grade Point Average of 2.75 overall, and 3.25 in the proposed M.A. major subject.
- 3) GRE General Test for all students.
- 4) TOEFL for international students (550 minimum for admission to the program; 600 minimum for teaching assistantship).
- 5) A letter of application written in the foreign language.
- 6) An interview with at least one member of the Foreign Language Education Committee or delegate conducted at least partially in the target language.
- 7) Three letters of recommendation.

Admission to the M.A. 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.

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 March 1, as the initial round of funding decisions will be made in mid-March. Students who miss the March 1 deadline may still be considered for any teaching assistantships or graduate scholarships not assigned in March.

Requirements for the Degree

Option I

Course work consists of 30 credits, including at least 15 in the major language (French, German, Spanish) and 9 in foreign language pedagogy; the remaining 6 credits, chosen with the consent of the adviser, can be in these or closely related fields.

Candidates must pass a written and oral comprehensive examination based on reading lists in the major literature and in foreign language pedagogy, as well as a reading competency examination in a second foreign language.

Option II (For In-Service Teachers Only)

This option is available only to current in-service teachers enrolled in the Summer Institute for Foreign Language Teachers.

Course work consists of 30 credits, including at least 9 in the major literature and 9 in foreign language pedagogy. At least six credits must be taken during the regular academic year.

Candidates must pass oral and written examinations emphasizing the theoretical and practical aspects of teaching language and literature (one section of both oral and written exams will be in the target language; the literary portion will be based on the year's Advanced Placement reading list), and achieve a rating of at least Intermediate High on the ACTFL OPI or the SOPI. Students must also present a portfolio of their work.

FINANCIAL AID

The Department of Foreign Languages and Literatures has two principal types of awards: teaching assistantships and graduate scholarships. Graduate Scholars teach six hours per week. Teaching Assistants may be assigned to the classroom (6 classroom hours per week), the Media Center (16-20 hours per week) or to individual faculty to serve as research or administrative assistants (16-20 hours per week). Graduate students who teach are assigned as team-teachers of elementary or intermediate foreign language courses. Experienced instructors take the MWF portion of the 5 day-a-week course, while graduate students are responsible for the TR portion.

STUDY ABROAD OPPORTUNITIES

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

SUMMER INSTITUTE FOR FOREIGN LANGUAGE TEACHERS

The Summer Institute for Foreign Language Teachers offers teachers of French and Spanish an opportunity to renew their speaking and writing skills in the language they teach, deepen their appreciation of the cultural content of foreign languages, and sharpen their pedagogical tools. Except for the pedagogy course (which comprises all modern languages), all instruction and classroom activities are conducted in the target language.

While it is not necessary to do so, some participants choose to pursue one of the department's M.A. programs, earning as many as 9 credits per summer towards their degrees.

GEOGRAPHY

Telephone: (302) 831-2294

The department offers programs leading to the Master of Arts and Master of Science degrees in geography and the Ph.D. degree in climatology. The graduate program provides the opportunity for students to interact frequently with a staff whose interests touch upon one of two particular themes: climatology, and human geography.

The climatology program emphasizes physical, synoptic, dynamic, and water budget climatology, as well as glaciology and climatic geomorphology. Climate research is directed toward solving numerous human and environmental problems.

The human geography program covers a broad range of themes approached from cultural-historical, socio-economic and humanistic perspectives. The study of landscapes, geographic ideas, perceptions and attitudes in a cross-cultural context (including philosophic and literary aspects) is another area of the program. Interdisciplinary work with other departments and the colleges of Agriculture and Natural Resources and Marine Studies is encouraged.

A University Center for Climatic Research has been established in the department, which also houses the Office of the State Climatologist for Delaware. Facilities include laboratories for cartography, climatology, and computer analysis. Graduate students have ready access to the University's Unix cluster with a variety of high-end machines. Departmental facilities include a smaller Unix cluster based on an SGI Challenge, Sparc stations, X terminals and PCs. Locally supported software includes: ArcInfo and ArcView GIS, and the McIDAS/Gempak weather analysis system. All of the department's computing facilities are fully integrated into the campus and worldwide networks. The department also is well-equipped with instrumentation for microclimatic studies and possesses an abundance of digitally-stored weather and climate data, principally for large scale investigations.

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.

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 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 PH.D. DEGREE

Applicants to the Ph.D. program in climatology are expected to have completed a master's degree in geography-climatology, meteorology, or a related discipline. Students in this program must also have completed mathematics through ordinary differential equations

(MATH 302) and must demonstrate a knowledge of at least one higher level computer programming language. Ph.D. students are expected to obtain an in-depth knowledge of two areas. One of these must be topical, such as bioclimatology, physical climatology or urban climatology, and the other must be methodological such as statistical methods, mathematics or computer science.

Students are also expected to have a broad knowledge of climatology and to demonstrate a high level of professional competence by passing a written qualifying examination, an oral examination and an oral dissertation defense. A description of the Ph.D. program in climatology can be obtained by contacting the Geography Department.

GEOLOGY

Telephone: (302) 831-2569 or 831-8750

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. The Department of Geology offers both field-oriented and laboratory-oriented research programs that take advantage of the University's geographic proximity to Appalachian, Atlantic Coastal Plain, and coastal terrains. Major research emphasis is Quaternary Geology.

The Department of Geology has cooperative programs with several nearby institutions, including the Delaware Geological Survey, U.S. National Museum, and Lamont-Doherty Earth Observatory. Departmental research is frequently carried out in cooperation with other departments and with the College of Marine Studies, which has a marine field station in Lewes, Delaware, and a seagoing oceanographic research vessel, *Cape Henlopen*.

The department owns a scanning electron microscope with attached x-ray spectrometer, x-ray diffraction apparatus, paleomagnetic equipment, laser particle counter, stereo-zoom transfer scope facility, diverse computer capability including Sun Workstations, largescale digitizer, gas and liquid chromatographs, ground penetrating radar, multichannel seismic equipment, various coring and drilling equipment, laser theodolite surveying system, and has ready access to nearly all other commonly used tools of geological and geophysical research. The department has a stable graduate program with 20 to 25 graduate students. Recent graduates have found positions in environmental consulting firms, academic institutions, federal and state geological surveys, and petroleum and mining industries.

REQUIREMENTS FOR ADMISSION

Admission to the graduate program in the Department of Geology is evaluated on the basis of the applicant's GRE scores, undergraduate record, three letters of recommendation and research interests. Applicants should have a combined verbal and quantitative GRE score of at least 1050. A minimum TOEFL score of 600 is required for foreign applicants for whom English is not the first language. The Department will consider qualified applicants without a previous degree in geology, although additional preliminary work may be required. Admission to the graduate program in the Department of Geology 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.

REQUIREMENTS FOR THE DEGREES

Requirements for the Master of Science degree include 30 credits of graduate study (6 of which are thesis credits and 3 are one-credit

800-level courses), 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 7 one-credit 800-level courses), and the research, preparation, and defense of the dissertation. All course programs are 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 adviser and thesis or dissertation committee.

Because of the value of the teaching experience, Ph.D. candidates in geology must teach a course or laboratory section for at least one term.

HISTORY

Telephone: (302) 831-8226

The Department of History offers M.A. and Ph.D. programs in American history, European history, and the history of technology. In conjunction with these, it has special programs focusing on the history of industrialization and on American social and cultural history, and provides an opportunity for students to earn a certificate in Museum Studies. The Department offers more limited graduate study in Ancient, African, Asian, Latin American, and Middle Eastern history, as well as courses in history education.

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

THE UNIVERSITY OF DELAWARE-HAGLEY PROGRAM

Prospective students with interests in the history of technology, science, business, economy, society, or labor may apply for fellowships in the University of Delaware-Hagley Program. The program focuses on the history of industrialization especially in comparative perspectives. University of Delaware-Hagley fellows may specialize in American history, European history, or the history of science and technology.

HISTORY OF AMERICAN CIVILIZATION

The Department of History in cooperation with the Winterthur Museum sponsors a Ph.D. 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 M.A. or Ph.D. candidate from any of the History graduate programs may qualify for a certificate in Museum Studies upon satisfactory completion of 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 M.A. and Ph.D. levels are offered. **Plan A** (Terminal 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 a sample of their research writing. **Plan B** (M.A. leading to Ph.D. degree) and Ph.D.: 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 a sample of their research writing. These averages are only minima and do not guarantee admission. The History Department normally accepts applications for all History programs **for the fall semester only**. The deadline for application is January 31, but early application is strongly encouraged. Applicants must submit three letters of recommendation. Students considering graduate work in history at the University of Delaware should write to the department for its bulletin *Guidelines to Graduate Programs in History*.

REQUIREMENTS FOR THE DEGREES

Candidates for the M.A. 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, and 2 research and writing seminars or one research seminar and a 6-credit M.A. thesis. Additionally, the Graduate Studies Committee will review the record of each M.A. student after he or she has completed three full semesters (or 21 credits) of graduate study; on the basis of this review the committee will inform the student whether he or she is making satisfactory progress toward the M.A. degree.

The Ph.D. degree recognizes the candidate's command of specific fields of history as well as the ability to conceive and execute a Ph.D. dissertation. Doctoral students do most of their work independently, under the supervision of their dissertation directors and other faculty members. The following specific requirements must be met: 9 hours of formal course work other than independent study courses which must include two of the department's basic historiography courses; demonstration of reading competence in a foreign language (faculties in certain specialties require additional language or skill requirements); passage of major and minor field exams; a dissertation prospectus submitted to the Graduate Studies Committee no later than six months following the field exams; and an oral exam in a field related to the student's dissertation topic that will include a discussion of the dissertation prospectus. After the preceding requirements have been met, the candidate must finish a dissertation and defend it in an oral exam.

MASTER OF ARTS IN LIBERAL STUDIES

Telephone: (302) 831-6075

REQUIREMENTS FOR THE DEGREE

Students working for the M.A.L.S. degree must take two interdisciplinary core courses, choose a series of interdisciplinary electives designed specifically for the program, and complete either a master's thesis or a synthesis project. By advisement of the Director and with consent of the course instructor, M.A.L.S. students may enroll in regular graduate offerings in the participating departments.

Designed primarily for adult, vocationally established individuals, the M.A.L.S. degree offers interdisciplinary graduate education centered in the humanities. The M.A.L.S. 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 include an official transcript of previous undergraduate and graduate studies, three supporting letters from individuals who can discuss the applicant's strengths and capabilities, and a short essay of about three pages describing the applicant's intellectual interests and how the applicant thinks these can be developed in the M.A.L.S. 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. 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.

LINGUISTICS

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

The Department of Linguistics offers programs leading to M.A. and Ph.D. degrees in Linguistics. The M.A. in Linguistics is a flexible degree, allowing students to design programs of study in areas of theoretical linguistics, applied linguistics (including teaching English as a second language) and cognitive science. Areas for Ph.D. specialization include theoretical linguistics (especially syntax and phonology), applied linguistics and computational linguistics. The Department of Linguistics also administers the program in Cognitive Science.

REQUIREMENTS FOR ADMISSION

Students with a B.A./B.S. or M.A./M.S. 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 math combined is normally required; the analytical score is also considered), and official transcripts of all previous work. Foreign students whose native language is not English must also submit scores on the TOEFL, on which a minimum of 550 is normally required. For these foreign students, the TOEFL score will be considered as the verbal section of the GRE when the TOEFL score is higher. In all cases, however, scores on all sections of the GRE must be submitted. Foreign students whose native language is not English and who are awarded a teaching assistantship must meet the Graduate School requirement for performance on either the Speak Test or the Test of Spoken English (TSE). The TSE may be taken overseas at any TOEFL center. Students should consult the appropriate section of the catalog for details of this requirement.

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 Ph.D. 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.

REQUIREMENTS FOR THE MASTER'S DEGREE

For the M.A., students must satisfy the requirements of either Option 1 or Option 2. Option 1 requires completion of 30 credit hours and a grade of PASS on the same Qualifying Exam taken by Ph.D. students. Option 2 requires completion of 36 credit hours to be planned in consultation with the student's adviser and the Director of Graduate Studies. Both options require a) that at least 21 of the required credit hours be taken in the Linguistics Department and b) the completion of at least one 800-level seminar. Full details of all programs are available from the department's Director of Graduate Studies.

REQUIREMENTS FOR THE PH.D. DEGREE

Students are required to take 69 credits beyond the B.A./B.S.: 60 credits in courses proper and 9 in dissertation. Students entering with a credited M.A./M.S. in an appropriate area as determined by the department must take 39 credits: 30 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, either LING 696 Psycholinguistics, or LING 680 Sociolinguistics, 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 in theoretical and applied linguistics, 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. While there is no formal graduate degree in Cognitive Science, the Ph.D. 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.

MATHEMATICAL SCIENCES

Telephone: (302) 831-2653

The Department of Mathematical Sciences offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy in Applied Mathematics and in Mathematics.

Most of the major areas of mathematics are included among the research interests of the faculty of the department, but the areas most heavily represented are applied mathematics, partial differential equations, integral equations, inverse problems, complex function theory, discrete mathematics, topology, and probability.

Each of the graduate programs in the department is relatively small allowing for close contact between graduate students and faculty. Individual attention is common. There are several active seminars on research topics and there is steady additional stimulus from professional visits by scientists from the U.S. and abroad.

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 ORE Aptitude Test. The advanced test in mathematics is highly recommended.

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 guarantee financial aid for 10 semesters for students entering with a Bachelor's degree; those entering with a Master's degree can expect to receive financial aid for 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 Bachelor's degree must pass the Candidacy Exam by the beginning of his/her 6th semester (in February). 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 guaranteed 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 the following August, 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

Master's degree students must complete 30 hours of course work beyond the Bachelor's degree. Students must maintain a GPA of 3.0 or better.

Core requirements (18 credit hours): MATH 600, MATH 602, MATH 611, MATH 616, MATH 672, and MATH 807.

Electives (6 credit hours): to be approved by the Graduate Committee.

Additional Requirements (6 credits):

For the Applied Mathematics M.S.: MATH 617 and a one semester course in an area of application (ELEG 667, CHEG 830, CIEG 639, MEEG 630 or a course approved by the graduate committee).

For the Mathematics M.S.: MATH 650 and MATH 688.

REQUIREMENTS FOR THE PH.D. DEGREE

Students with no prior graduate course work must complete 54 credit hours of courses, plus an additional 9 credits of MATH 969 (Doctoral Dissertation). A maximum of 6 credit hours of research (MATH 868) is allowed to count as an elective in the 54 credit hour requirement. Of

the 54 hours, a maximum of 27 credit hours of 600-level courses in the mathematics department is allowed. All electives must be approved by the graduate committee. After completing their course requirements, students are expected to enroll for at least one course each semester (which may be as a listener) in addition to MATH 964 or MATH 969. A GPA of 3.0 or better must be maintained.

Students entering with a Bachelor's degree must pass the Preliminary Exam in order to continue beyond their second year (beyond the first year for those entering with a Master's degree). A second written exam, the Candidacy Exam, must be passed in order for a student to be admitted to Ph.D. candidacy.

Core Requirement (21 credits): All Applied Mathematics and Mathematics students must complete MATH 600, MATH 602, MATH 611, MATH 616, MATH 672, MATH 806, MATH 807.

Doctoral Dissertation (9 credits): MATH 969.

Additional requirements (33 credits):

For the Applied Mathematics Ph.D.: MATH 612, MATH 617, MATH 810, and two semesters in areas of application (ELEG 667, CHEG 830, CIEG 639, MEEG 630 or courses approved by the graduate committee) plus 18 credits of electives

For the Mathematics Ph.D.: MATH 650, MATH 688, MATH 827, and MATH 845 plus 21 credits of electives.

Other Requirements for the Ph.D.

Preliminary Exam: Offered before the beginning of each semester, this written examination covers material from MATH 600 and MATH 602 (Advanced calculus) and MATH 672 (Linear algebra). Students entering with Bachelor's degrees are required to pass the Preliminary Examination by the beginning of their 4th semester (by the beginning of their 2nd semester for students entering with Master's degrees). Students who do not meet this requirement are recommended for dismissal.

Candidacy Exam: This written examination is administered in February. A student entering with a Bachelor's degree must pass the Candidacy Exam by the beginning of his/her 6th semester of study (by the 4th semester of study for those entering with a Master's degree). A second and final attempt is permitted in the following August. 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 and Discrete Mathematics. The exams are based on MATH 650 and MATH 845 (Algebra), two chosen from MATH 805, MATH 806 and MATH 807 (Analysis), MATH 616, MATH 617 and MATH 810 (Applied Mathematics) and MATH 688 and MATH 689 (Discrete Mathematics). 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.

Language Requirement: The department requires the Ph.D. candidate to have reading knowledge of one of four languages: French, German, Italian or Russian. Substitutions may be allowed upon petition.

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.

MUSEUM STUDIES

Telephone: (302) 831-1251

The program offers courses in the history, philosophy and functions, leadership and management, curatorship, educational offerings, interpretive programs, exhibitions and public dimension of

institutions that collect, preserve, study, and disseminate information about our cultural heritage. A certificate in Museum Studies may be earned in conjunction with a graduate degree in history, art history, art, early American culture, public horticulture, business administration, liberal studies, and other fields appropriate for students planning careers in history, art, natural history, science and technology, and other kinds of museums. Students are admitted who are accepted for graduate work in joint programs of the University and the Hagley Museum, Longwood Gardens, and the Winterthur Museum, as well as students enrolled in associated University departments.

Students wishing to enroll in Museum Studies should apply for admission to the University Office of Graduate Studies indicating the graduate degree program of their choice.

MUSIC

Telephone: (302) 831-2577

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 two concentrations: Performance (emphasizing studio instruction or conducting, and culminating in a public recital) and Teaching (directed towards music educators in grades K-12 who desire a master's degree in this discipline).

RESEARCH FACILITIES

Music study is enriched by the well-equipped and modern facilities in the Amy E. du Pont Music Building, with its large rehearsal rooms, ample practice rooms and Loudis Recital Hall. 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 study scores and chamber music, as well as a fine collection of audio and video recordings. The building also houses extensive electronic equipment to support the work in computer and video-disc technology which has earned the department international acclaim.

REQUIREMENTS FOR ADMISSION

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 department's Committee on Graduate Studies, revealing an acceptable grade-point average (normally 3.0). Finally, the student must provide the Coordinator of Graduate Studies with a statement of professional goals and three letters of recommendation. Students applying for admission to the Performance Concentration must pass an audition.

Applicants must also perform satisfactorily on the department's music theory and music history placement tests prior to enrolling in MUSC 695 (Advanced Analytical Techniques) or MUSC 611 (Studies in Music History). Any and all deficiencies indicated must be corrected before the student may enroll in these courses. This may be accomplished through enrollment in one or more existing undergraduate music theory or literature courses or through a program of self-study, tutoring, or laboratory work. The department's Coordinator of Graduate Studies will prescribe remedial

action, if any, appropriate for each person. The student will be required to retake and pass the portions of the placement exams in which deficiencies were found before enrolling in the above-mentioned courses.

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's Coordinator of Graduate Studies for information. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREE

I. Performance Concentration

Courses

Students are required to complete 33 credit hours (maintaining a grade average of B or better) to be granted the degree Master of Music: Performance. All students take the following:

- MUSC 601 Master's Recital (2 cr.)
- MUSC 603 Chamber Music Literature (3 cr.)
- MUSC 611 Studies in Music History (3 cr.)
- MUSC 620 Large Ensemble (1 cr.)
- MUSC 621 Chamber Ensemble (1 cr.)
- MUSC 622 Materials and Methods of Research (3 cr.)
- MUSC 661 Advanced Private Study (4 cr.)
- MUSC 662 Advanced Private Study (4 cr.)
- MUSC 681 Pedagogy and Literature (3 cr.)
- MUSC 695 Advanced Analytical Techniques (3 cr.)

Students will elect one of the following:

- MUSC 605 Symphonic Literature (3 cr.)
- MUSC 663 Advanced Keyboard Literature (3 cr.)

There is one elective in the program, which may be taken from among Music Department offerings or elsewhere in the University with the approval of the student's advisor (3 cr.)

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. Teaching Concentration

Courses

Students are required to complete 30-31 credit hours (maintaining a grade 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 cr.)
- MUSC 622 Materials and Methods of Research (3 cr.)
- MUSC 695 Advanced Analytical Techniques (3 cr.)

Music Education Courses (6 cr.)

- MUSC 640 Philosophical Issues in Music Education (3)
- MUSC 676 Seminar in Music Education (3)

Specialization Component (3-4 credits)

Students can elect one of three areas of specialization: Choral Conducting, Instrumental Conducting, or General Music K-12. The courses for each are as follows:

Choral Conducting

- MUSC 636 Advanced Choral Conducting (3)
 MUSC 638 Large Ensemble Practicum (1)
 (Large Ensemble to be chosen with the approval of the faculty advisor)

OR**Instrumental Conducting**

- MUSC 637 Advanced Instrumental Conducting (3)
 MUSC 638 Large Ensemble Practicum (1)
 (Large Ensemble to be chosen with the approval of the faculty advisor)

OR**General Music K-12**

- MUSC 675 General Music K-12 (3)

Thesis or Project (6 credits)

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 Improvement Project I (3)
 MUSC 680 Professional Improvement 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.

NEUROSCIENCE

Telephone: (302) 831-3311

The Graduate Program in Neuroscience is an interdisciplinary program leading to the Ph.D. in a traditional academic discipline (Biological Sciences or Psychology) and in Neuroscience. Faculty who participate in the Neuroscience Program are from the Departments of Biological Sciences, Psychology, Physical Therapy, and Electrical and Computer Engineering. Research areas explored by these faculty range from molecular neuroscience to behavioral neuroscience. The goal of the program is to ensure that students are expert in their specialty in neuroscience as well as conversant with the broad range of multidisciplinary neuroscience.

In close apprenticeship relationships with research advisers and other faculty in the program, students are trained to master multidisciplinary techniques in order to address the current issues in neuroscience. The research of each student in the program is supervised by a committee that is chaired by the student's research adviser and includes faculty from the academic units that participate in the Neuroscience Program.

Neuroscientists at the pharmaceutical laboratories of The DuPont Company, DuPont-Merck, and AstraZeneca in Wilmington, Delaware, and at the U.S. government laboratories in Aberdeen, Maryland work closely with University faculty in the training of graduate students. Through these experiences, students are exposed to the research environments of industrial and governmental laboratories.

REQUIREMENTS FOR ADMISSION

Students with interest and background in the interdisciplinary aspects of neuroscience should apply to the University through one of the two participating academic units (Departments of Psychology or Biological Sciences). Students must meet the admission requirements of the academic unit to which they apply before they may be considered for admission to the Graduate Program in Neuroscience. Students are encouraged to consult with any of the participating faculty, or with the Director of the Neuroscience Program for additional information relating to the neurosciences. Students may also apply to the Program in Neuroscience after matriculation into one of the participating academic units.

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 must satisfy the degree requirements of the participating academic unit into which they have been accepted. In addition, to gain competence and breadth in the major areas of neuroscience, students must take four core courses in the neuroscience curriculum, one year of statistics, and pass a qualifying examination in neuroscience. The core courses in the program are neuroanatomy, cellular neurophysiology, neuropharmacology, and integrative neurophysiology.

PHYSICAL THERAPY

Telephone: (302) 831-8910

The Physical Therapy Department offers a Master of Physical Therapy (M.P.T.) degree program. This is an entry-level degree which will qualify the graduate to sit for the physical therapy licensure examination in any state in the country. The program is accredited by the Commission on Accreditation in Physical Therapy Education.

The Physical Therapy Department is housed in McKinly Laboratory and has modern well-equipped laboratories for research, teaching, and clinical practice. In addition, there is a physical therapy practice clinic which is staffed by students who are supervised by faculty members. All students are required to register for the practice clinic at least once during the degree program.

REQUIREMENTS FOR ADMISSION

The minimum requirements for the MPT program are:

- a bachelor's degree from an accredited institution
- documented volunteer or paid clinical experience in physical therapy (200 hours)
- three letters of recommendation
- Graduate Record Examination Verbal and Quantitative scores
- if requested, an interview with the admissions committee

Admission to the M.P.T. program requires demonstrated academic excellence, evidence of physical therapy clinical experience, and the following (or equivalent): two years of biological sciences, including physiology and anatomy; one year of inorganic chemistry; calculus; one year of physics; one year of psychology; one semester of English; and one semester of statistics. All course work must be completed prior to beginning the professional program.

Application is made to the University's Office of Graduate Studies. In addition, three letters of recommendation from persons

able to judge the applicant's ability to pursue physical therapy graduate study should be sent to the Chair of the Physical Therapy Department. Two of these letters should be from licensed physical therapists who have observed the applicant in a clinical environment. Application deadline is January 16.

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

The M.P.T. program requires 69 hours of graduate course work. These hours are in such areas as didactic instruction, experiential laboratories, research, clinical internships, or other equivalent academic experiences. Clinical internships comprise 15 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 years duration, including summers. Part-time matriculation is not typically permitted. A thesis option is available for students interested in pursuing research.

MASTER OF PHYSICAL THERAPY CURRICULUM

GRADUATE YEAR 1		CR
Summer		
PHYT 600	PT as a Profession	1
	(Second Summer Session)	
PHYT 622	Clinical Gross Anatomy	6
	(Second Summer Session)	
		7
Fall		
PHYT 801	Medical Science I	2
PHYT 604	Functional Anatomy	3
PHYT 602	Patient Management I	3
PHYT 603	Physical Agents	2
PHYT 624	Introduction to Evaluation Techniques	1
PHYT 606	Research	3
		14
Winter		
PHYT 605	Clinical Internship	3
Spring		
PHYT 601	Exercise Physiology	3
PHYT 623	Clinical Neuroscience	4
PHYT 607	Electrotherapy	3
PHYT 620	Educational Process in Community Health	1
		11
GRADUATE YEAR 2		CR
Summer		
PHYT 608	Musculoskeletal Evaluation	3
	(First Summer Session)	
PHYT 802	Medical Science II	2
	(First Summer Session)	
PHYT 605	Clinical Internship	3
	(Second Summer Session)	
		8
Fall		
PHYT 609	Neurophysiologic Evaluation	3
PHYT 611	Clinical Management	1
PHYT 617	Patient Management II	3

PHYT 618	Life Span Development	3
PHYT 803	Medical Science II	2
PHYT 610	Psychosocial Aspects	2
		14

Winter

PHYT 619	Advanced Seminar	2
		2

Optional Electives-Hours do not count towards total required hours for degree.

Maximum of two electives. (6)

Spring

PHYT 605	Clinical Internship	6
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Note: PHYT 621 Practice Clinic (1 cr) must be taken at least once during the degree program. 1

Summer

PHYT 605	Clinical Internship	3
	(First Summer Session)	

Total Hours **69**

Note: The curriculum is subject to modification as needed.

PHYSICS AND ASTRONOMY AND THE BARTOL RESEARCH INSTITUTE

Physics Telephone: (302) 831-2661 or 831-2662

Bartol Telephone: (302) 831-8111

The Department of Physics and Astronomy and the Bartol Research Institute offer joint graduate programs leading to the M.A., M.S., and Ph.D. degrees. The Department and Institute are located in Sharp Laboratory, which houses a physics library, research and teaching laboratories, a fully equipped and staffed machine shop, and electronics shop. Ample computing facilities are available, including access to the Internet and national supercomputing centers.

The Joint Graduate Program is well equipped for experimental research in condensed matter and materials physics, acoustics, atomic and molecular physics, and biophysics. Research facilities include a high pressure laboratory, electron microscopy and x-ray diffraction laboratories, specialized laser facilities, and a 2.3 MV Van de Graaff accelerator used for PIXE and other analytical studies of materials and thin films. In addition, numerous facilities are available for the preparation and study of structural, thermal, transport, optical, acoustic, and magnetic properties of solids and liquids.

Experimental and observational research opportunities in astronomy and astrophysics are available through the Joint Graduate Program. Space science research is supported through a number of in-situ NASA satellite experiments such as the Voyager Interstellar Mission, the Mars Global Surveyor (MGS), Advanced Composition Explorer (ACE), WIND spacecraft in The Global Geospace Project and SOHO (Solar and Heliospheric Observatory), as well as a program of high altitude balloon flights.

Research in observational astrophysics includes use of the NASA great observatories, the VLA radio telescope in New Mexico, and ground based and underground cosmic ray laboratories around the world. Bartol operates 2 neutron monitors, a millimeter telescope, a cosmic ray air shower experiment and a solar observatory in Antarctica. The Mt. Cuba Astronomical Observatory is associated with the University of Delaware and makes a 24-inch Cassegrain telescope available for observational research. The Bartol Research Institute leads a consortium of 9 regional institutions of higher learning which are part of the National Space Grant College Program.

Theoretical research is an essential part of the Joint Graduate Program. Opportunities are available in condensed matter and materials physics, particle physics, cosmology, atomic and molecular physics, astrophysics, space physics, plasma physics, and nuclear physics. Many of these theoretical activities involve a close working relationship with related experimental programs. Extensive numerical modeling is done both locally and at national supercomputing laboratories.

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. A minimum undergraduate grade point average of 3.2 or its equivalent is recommended for admission. In addition, scores for the Graduate Record Exam (GRE), Verbal, Quantitative and Analytic, and the GRE Physics Subject Test are required. A complete official transcript or equivalent certified written record of academic work to date is also essential. This should list the courses taken and the individual grades awarded. At least three letters of reference should be sent independently by professors or others who are familiar with the applicant's academic work. For students whose first language is not English, the Test of English as a Foreign Language (TOEFL) is required. For financial support, a TOEFL score exceeding 600 is required. Of the reference letters, at least one should be from someone familiar with graduate study in the U.S.A. and at least one should address the applicant's English speaking ability.

FINANCIAL AID

Financial aid is available to graduate students in the form of teaching assistantships, research fellowships, and University fellowships. Inquiry regarding these appointments may be made when applying for admission. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREES

The M.A. degree program requires 30 credit hours of graduate level formal course work, at least 24 of which are taken in PHYS. The course work will not be accomplished merely by accretion of scattered credits, but will be methodically planned in consultation with the student's faculty advisor. In appropriate circumstances a project entered under PHYS 868 could be submitted for as many as 3 of the credits of formal course work. Because it requires neither research nor a thesis, the M.A. degree can be completed more rapidly than the M.S. degree and may be the more suitable for students able to attend only on a part-time basis. But the M.A. degree is viewed as a terminal degree, and its recipients will not normally be considered for candidacy in the M.S. or Ph.D. programs in Physics.

Twenty-four credit hours of course work are required for the M.S. degree; at least 6 must be in 800-level courses in physics. In addition, 6 credit hours of thesis (PHYS 869) must be completed. Approval of the department review committee is required if more than 6 of these 24 are from departments other than physics or if any are in a discipline unrelated to physics. After the M.S. thesis is completed, the candidate defends the thesis in an oral examination administered by the thesis committee.

Prospective Ph.D. candidates are frequently chosen from among those who have successfully completed a master's degree program either at Delaware or elsewhere. However, a physics graduate student may bypass the M.S. degree by:

1. Taking and passing the preliminary and qualifying examinations within two years of entering graduate work (two and one-half years for students admitted in January), and
2. Taking and passing, with a grade of B (3.000) or better, 30 credits of course work within the first five semesters after entering graduate work. At least 21 of these credit hours must be from among PHYS 607/8, and 800-level physics courses.

A student entering the department with a master's degree must either:

1. Take at least 12 credit hours of course work during the first year, including 6 at the 800 level, and take the qualifying exam within one year, and pass it within two years;
- or
- 2) Satisfy the bypass option mentioned above.

All Ph.D. students must take a minimum of 12 credit hours of classroom course work beyond the core curriculum. These courses must be at or above the 600 level and be in physics or physics-related areas.

The preliminary exam based on several general physics texts is given twice a year in September and February. It must be taken by all students immediately after entry into the program and passed before the beginning of their second semester.

The qualifying examination, which is based on a core of graduate-level courses, is given twice per year, in late August and in early February. The Ph.D. candidate must pass this examination within three and a half years after arriving at Delaware. Most students take the examination for the first time at the end of their second year.

Upon successful completion of a research program, the candidate is required to pass a final oral examination that includes the defense of the dissertation and discussion of relevant material. Progress of a student through the graduate program is reviewed regularly by a departmental review committee.

The research content of the M.S. and Ph.D. program can be chosen from among current faculty research activities within astronomy, astrophysics, atomic and molecular physics, biophysics, condensed matter and materials physics, cosmic ray physics, nuclear and elementary particle physics, and solar and space physics. More detailed information on research areas and facilities is contained in a departmental brochure available upon request.

POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Telephone: (302) 831-2355

The Department of Political Science and International Relations offers three graduate degree programs: M.A. and Ph.D. in political science and M.A. in international relations. Political Science fields of specialization include American Politics and Institutions, Comparative Politics, International Politics, Law and Courts, Political Philosophy and Public Administration and Public Policy. The department also participates in the Master of Public Administration degree in conjunction with the College of Urban Affairs and Public Policy.

The master's program offers advanced study in political science for students interested in later pursuing Ph.D. studies, entering government service, or other careers.

The Ph.D. program provides opportunities for the development of research and teaching skills necessary for careers in education or public service.

REQUIREMENTS FOR ADMISSION

To be accepted into the program students are evaluated on several criteria.

For the Ph.D.:

- Performance on GRE aptitude test (normally 1700 for the 3 combined 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).

For the M.A.:

- Performance on GRE aptitude test (normally 1500-1600 for the 3 combined aptitude scores).
- Undergraduate grade-point averages (normally a 3.0 overall and 3.2 in major field).
- Three letters of recommendation.
- For international students, a TOEFL score (normally at least 600).

Utilizing all of these variables, the department attempts to predict the candidate's success (e.g., low GRE scores could be balanced by high grades and very strong recommendations). Applicants are encouraged to submit examples of written work.

In addition, admission to the graduate program is affected by the number of well-qualified applicants and the limits of available faculty. Those who meet stated minimum academic requirements are not guaranteed admission.

REQUIREMENTS FOR THE DEGREES

The program of study is divided into six fields: political theory, public policy and administration, comparative government, international relations, law and courts, and American government. Students may complete the M.A. degree through either a 1-year or 2-year program, and may complete the Ph.D. in four to five years. The relatively small size of both the M.A. and Ph.D. programs insures individualization of students' degree plans and encourages faculty-student cooperation in areas of special interest. Financial aid is available. Applicants are also eligible to compete for university-wide fellowships.

The M.A. in Political Science program requirements are the following: 30 credits of course work including POSC 800 Seminar: Philosophy of Political Inquiry; POSC 801 Research Design; seminars in three of the six fields offered by the department; and a comprehensive examination in one field. A research requirement may be met through an M.A. thesis (6 credit hours) or a major seminar research paper.

The M.A. in International Relations requires 30 credits of course work including POSC 800 Seminar: Philosophy of Political Inquiry, POSC 830 Seminar: International Relations, POSC 810 Seminar: Comparative Politics, POSC 840 International Political Economy, and one seminar selected from POSC 803 Public Administration, POSC 808 American Political Institutions, POSC 833 Normative Political Theory, POSC 838 Public Policy Analysis, or POSC 805 Seminar: Public Law, a comprehensive examination in international relations, and competency in one language in addition to English. A thesis (6 credits) is also required.

The Ph.D. program requires POSC 800 Seminar: Philosophy of Political Inquiry, POSC 801 Research Design, knowledge of one foreign language, competence in social science statistics, 60 credit hours (or an M.A. plus thirty additional credits), comprehensive examinations in three fields, and a Ph.D. dissertation.

PSYCHOLOGY

Telephone: (302) 831-2271

The Department of Psychology offers a doctoral degree program in psychology, with specialization in the areas of social psychology, cog-

nitive psychology, biological psychology, 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 research workers 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 information processing, child development, electrophysiology, pharmacological and physiological bases of animal behavior, psychophysiology, small group behavior, interpersonal communication, psycholinguistics and visual processing. 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, a complete photography set-up, and an electronics and carpentry shop. 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 the chapter "Graduate Fellowships and Assistantships" in this catalog 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. The Master's Degree is optional.

Successful completion of the second year project, the qualifying exam, and the dissertation proposal are necessary for admission to candidacy for the Ph.D. Progress toward the Ph.D. is achieved through completion of advanced work, dissertation research, and a clinical practicum and internship for students in the clinical area.

SOCIOLOGY AND CRIMINAL JUSTICE

Telephone: (302) 831-2581

The Department of Sociology and Criminal Justice offers a Master of Arts and a Doctor of Philosophy degree program in both sociology and criminology. Students may develop specializations in any of the following areas: social theory, research methods, urban sociology, sociology of sex and gender, sociology of law, organizations, and deviance. The graduate program is oriented toward providing students with professional training for a variety of academic and research careers in sociology or criminology. Career objectives may include employment in industry, governmental agencies, research, or college and university teaching.

RESEARCH CENTERS

The Department of Sociology and Criminal Justice sponsors two research centers. The Disaster Research Center conducts international and national studies of disasters and the Center for Drug and Alcohol Studies conducts research on drug and alcohol abuse. Both receive federal funding and offer research assistantships to graduate students.

REQUIREMENTS FOR ADMISSION

Applicants should submit transcripts of all academic work, Graduate Record Examination scores, and three letters of recommendation. Applications for fall admission should be completed by March 1. Students applying for financial aid for fall admission must complete applications by 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 and research assistantships are available to graduate students at the M.A. and Ph.D. levels. Please refer to the chapter "Graduate Fellowships and Assistantships" in this catalog for additional information.

REQUIREMENTS FOR THE DEGREES

Students are required to complete 30 credit hours for the **Master of Arts degree in sociology**. The courses required are as follows:

- SOCI 605 Data Collection (3 credits)
- SOCI 612 Foundations of Sociological Theory (3 credits)
- EDST 861 Introduction to Statistical Inference (3 credits)

In addition, one course must be taken from any two of the following three areas: deviance, social stratification, and organization. The remainder are selected in consultation with an advisor. Students may satisfy the requirement by completing 30 credits of course work and preparation of written examination, by completing 24 credits of course work and preparation of a thesis (6 credits), or by completing 24 credits of course work and an internship. The internship M.A. is intended for students who do not plan to go on for the Ph.D. degree.

For the **Master of Arts in Criminology degree** students must take 30 credits plus comprehensive examinations in Criminology and Theory or Methods, 24 credits plus a thesis, or 24 credits plus an internship. The courses required are as follows:

- SOCI 605 Data Collection (3 credits)
- SOCI 612 Foundations of Sociological Theory (3 credits)

- EDST 861 Introduction to Statistical Inference (3 credits)
- SOCI 835 Criminal and Delinquent Behavior (3 credits)

In addition, three courses (9 credits) must be taken from offerings in the areas of Criminal and Delinquent Behavior and Criminal Justice and Legal Systems.

For the **doctoral degree in sociology** the requirements are a minimum of 12 credit hours in substantive sociology courses, one year in residence, 9 dissertation hours, the four courses required for the Master of Arts course requirement, and:

- SOCI 813 Current Issues in Social Theory (3 credits)
- EDST 845 Regression Models in Education (3 credits)

And one of the following:

- SOCI 606 Advanced Data Collection (3 credits)
- SOCI 611 Techniques of Demographic Analysis (3 credits)
- SOCI 614 Data Analysis (3 Credits)

Students must also successfully complete written comprehensive examinations in two substantive areas and are expected to complete a dissertation representing an original contribution to the sociological literature.

For the **doctoral degree in criminology**, the following courses are required in addition to the Master of Arts requirements:

- SOCI 813 Current Issues in Social Theory (3 credits)
- EDST 845 Regression Models in Education (3 credits)
- SOCI 836 Seminar in Criminal and Delinquent Behavior (3 credits)

And one of the following:

- SOCI 606 Qualitative Methods (3 credits)
- SOCI 611 Techniques of Demographic Analysis (3 credits)
- SOCI 614 Data Analysis (3 credits)

and at least 15 credits from among the offerings in Criminal and Deviant Behavior, Criminal Justice and Legal Systems and related courses.

Students must also complete two written comprehensive examinations, one in Criminology and one in another standing area, and are expected to complete a dissertation.

THEATRE

Telephone: (302) 831-2201

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 Studies 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 \$40 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).

FINANCIAL AID

The PTPP offers a variety of financial awards ranging from full fellowships to partial tuition scholarships. All awards are based on merit. Fellowship and tuition scholarships 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. 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.

YEAR 1: Students enroll in the following courses during year #1.

	Crs.
THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	6
(3 credits each semester)	
THEA 665 Theatre Literacy (2 credits each semester)	4
Total Year #1	22

YEAR 2: Students enroll in the following courses during year #2.

THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	6
(3 credits each semester)	
THEA 665 Theatre Literacy (2 credits each semester)	4
Total Year #2	20

YEAR 3: Students enroll in the following courses during year #3.

THEA 600 Distinctions of Professional Theatre Practice	2
(1 credit each semester)	
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	10
(5 credits each semester)	
Total Year #3	20

TOTAL GRADUATION CREDITS 62

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.

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 633	Stage Management Organizational & Managerial Techniques IA (2 credits fall)	2
THEA 634	Stage Management Organizational & Managerial Techniques IB (1 credit spring)	1
THEA 639	Stage Management Production Skills IA (2 credits fall)	2
THEA 640	Stage Management Production Skills IB (2 credits spring)	2
THEA 645	Rehearsal & Performance/Stage Management (1 credit fall; 2 credits spring)	3
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 680	Lighting Production (1 credit fall)	1
THEA 681	Audio Production (1 credit spring)	1
THEA 693	Production Coordination (1 credit each semester)	2

Total Year #1 22

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 635	Stage Management Organizational & Managerial Techniques IIA (2 credits spring)	2
THEA 641	Stage Management Production Skills IIA (2 credits fall)	2
THEA 645	Rehearsal & Performance/Stage Management (3 credits each semester)	6
THEA 648	Costume Construction (1 credit spring)	1
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 674	Scenery Production (1 credit fall)	1
THEA 675	Properties Production (1 credit spring)	1

Total Year #2 21

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 636	Stage Management Organizational & Managerial Techniques IIB (1 credit spring)	1
THEA 642	Stage Management Production Skills IIB (1 credit fall)	1
THEA 645	Rehearsal & Performance/Stage Management (4 credits each semester)	8
THEA 694	Special Topics in Theatre Production (2 credit each semester)	4

Total Year #3 18

TOTAL GRADUATION CREDITS 61

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 drafting (manual and CAD), properties construction, audio production, scenic painting, stage carpentry, stage electronics, 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.

YEAR 1: Students enroll in the following courses during year #1.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 674	Scenery Production (1 credit fall)	1
THEA 675	Properties Production (1 credit spring)	1
THEA 680	Lighting Production (1 credit fall)	1
THEA 681	Audio Production (1 credit spring)	1
THEA 686	Information Technologies for Theatre (1 credit fall)	1
THEA 687	Scenery Painting (1 credit spring)	1
THEA 688	CAD & Scenery Construction (1 credit spring)	1
THEA 692	Production & Performance/Technical (1 credit fall, 2 credits spring)	3
THEA 693	Production Coordination (1 credit each semester)	2

Total Year #1 20

YEAR 2: Students enroll in the following courses during year #2.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 639	Stage Management Production Skills IA (1 credit spring)	1
THEA 665	Theatre Literacy (2 credits each semester)	4
THEA 676	Scenery: Metalworking (1 credit fall)	1
THEA 677	Properties: Upholstery & Draping (1 credit fall)	1
THEA 678	Properties: Casting & Mold-making (1 credit spring)	1
THEA 679	Scenery: Stage Rigging (1 credit spring)	1
THEA 682	Lighting Design (1 credit spring)	1
THEA 689	Advanced Scene Painting (1 credit fall)	1
THEA 690	Advanced CAD (1 credit fall)	1
THEA 692	Production & Performance/Technical (3 credits each semester)	6

Total Year #2 22

YEAR 3: Students enroll in the following courses during year #3.

THEA 600	Distinctions of Professional Theatre Practice	2
	(1 credit each semester)	
THEA 601	Dynamics (1 credit each semester)	2
THEA 692	Production Preparation & Performance/Technical (4 credits each semester)	8
THEA 694	Special Topics in Theatre Production (3 credits each semester)	6

Total Year #3 18

TOTAL GRADUATION CREDITS 60

**WINTERTHUR PROGRAM IN
EARLY AMERICAN CULTURE**

Telephone: (302) 831-2678

The Winterthur Program in Early American 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 Henry Francis du Pont Winterthur Museum 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 directly to the Winterthur Program in Early American Culture 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 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 full tuition and an annual stipend. Application for the program and these fellowships can only be made by applying to the program through the Director's office, 304 Old College. 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, and 19th centuries. Extracurricular activities 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 chosen from art history, history, and English. In addition to traditional courses, these departments also embrace such fields as folklore, vernacular architecture, and media study.

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 Early American Culture.