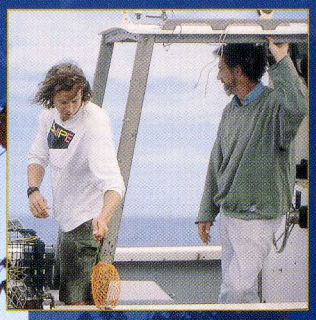
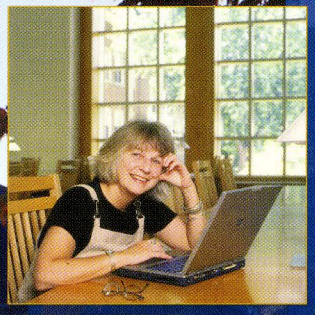
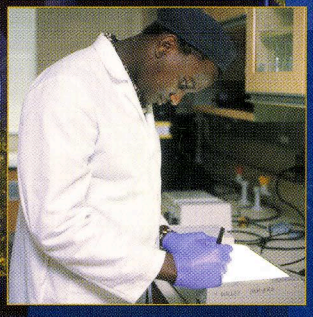






CATALOG 2001–2003

GRADUATE SCHOOL

UNIVERSITY *of* NEW HAMPSHIRE

Welcome to the

University of New Hampshire

General Information **5**

Admission and Registration **6**

Fees and Financial Aid **9**

Academic Regulations and Degree Requirements **13**

Research **17**

Graduate Life **25**

Departmental Requirements and Courses **32**

Trustees, Administrative Officers, and Graduate Council **91**

Faculty **92**

Index **102**

Directions to Campus **104**

Campus Map **105**

Academic Calendars 2001-2003 ..... **106**

Frequently Called Numbers **107**

Photo Captions **108**

Master of Arts

Counseling
Economics
English
  Language and Linguistics
  Literature
  Writing
Environmental Education
History
  Museum Studies
Music
  Music Education
  Music History
Political Science
Psychology
Sociology
Spanish

Master of Science

Accounting
Animal Sciences
Biochemistry
Chemical Engineering
Chemistry
Civil Engineering
Communication Sciences and Disorders
Computer Science
Earth Sciences
  Geology
  Ocean Mapping
  Oceanography
Electrical Engineering
Family Studies
  Marriage and Family Therapy
Genetics
Hydrology
Kinesiology
Materials Science
Mathematics
  Applied Mathematics
  Statistics
Mechanical Engineering
Microbiology
Natural Resources
  Environmental Conservation
  Forestry
  Soil Sciences
  Water Resources
  Wildlife
Nursing
Nutritional Sciences
Occupational Therapy
Ocean Engineering
  Ocean Mapping
Physics
Plant Biology
Resource Administration and Management
Resource Economics
Zoology

Master of Arts in Teaching

Elementary Education
Secondary Education

Master of Education

Administration and Supervision
Counseling
Early Childhood Education
  Special Needs
Elementary Education
Reading
Secondary Education
Special Education
Teacher Leadership

Master of Science for Teachers

Chemistry
College Teaching
English
Mathematics

Master of Business Administration

Master of Adult and Occupational Education

Master of Arts in Liberal Studies

Master of Fine Arts

Painting

Master of Public Administration

Master of Social Work

Certificate of Advanced Graduate Study

Educational Administration and Supervision

Doctor of Philosophy

Animal and Nutritional Sciences
Biochemistry
Chemistry
Computer Science
Earth Sciences
  Geology
  Oceanography
Economics
Education
Engineering
  Chemical Engineering
  Civil Engineering
  Electrical Engineering
  Materials Science
  Mechanical Engineering
  Ocean Engineering
  Systems Design
English
Genetics
History
Literacy and Schooling
Mathematics
Mathematics Education
Microbiology
Natural Resources
Physics
Plant Biology
Psychology
Sociology
Zoology

Center for Graduate and Professional Studies at the University of New Hampshire at Manchester

Master of Science

Computer Science
Electrical Engineering
Mechanical Engineering

Master of Arts in Teaching

Elementary Education
Secondary Education

Master of Education

Elementary Education
Secondary Education

Master of Business Administration

Master of Public Administration

Master of Social Work

The University

UNH is ideally located within easy driving distance to the White Mountains, the Seacoast Area of New Hampshire, and Boston, and enrolls more than 12,000 students in Durham and has a full-time faculty of more than 600. The student body includes more than 2,100 graduate students. A rising star among research universities, the University retains the look and feel of a New England liberal arts college with a faculty dedicated to teaching.

UNH is a land-, sea-, and space-grant research university. It is made up of seven schools and colleges, including the Colleges of Liberal Arts, Engineering and Physical Sciences, Life Sciences and Agriculture, the Whittemore School of Business and Economics, the School of Health and Human Services, and the Thompson School of Applied Science; the Division of Continuing Education; the University of New Hampshire at Manchester; and the Graduate School.

The University System of New Hampshire, of which UNH is a member, also includes Keene State College, Plymouth State College, and the College for Lifelong Learning.

The University awarded its first Ph.D. in 1896, placing it among the earliest American universities to award that degree. Doctoral programs in their present form began in the 1950s.

Graduate Education

The mission of the Graduate School is to provide innovative, responsive, and accessible master's and doctoral programs of the highest quality to graduate students. Our programs foster a close interdependence between research and classroom teaching. The 550 graduate faculty members and 2,100 graduate students at UNH work together to develop new theoretical and empirical knowledge, design innovative methods and technologies to discover and disseminate that knowledge, and engage in undergraduate and graduate state-of-the-art teaching. The Graduate School is a source of intellectual capital for the University, the region, and the nation.

As the state's only public University, UNH occupies a unique role. It is the primary institution within the University System of New Hampshire responsible for providing graduate programs that meet state, regional, and national needs—and the only one at which doctoral programs are offered. Other units of the University System do offer some master's programs.

The Graduate School is led by the dean, who implements the policies of the graduate faculty. The dean is advised by the Graduate Council, which is composed of elected faculty members and graduate student representatives.

Master's Programs

The University offers master's degree programs in a wide variety of disciplines which can serve either as professional terminal degrees or as intermediate degrees for those intending to pursue further graduate study. In many programs, students can elect options that will permit them to study one aspect of a discipline in depth by preparing a thesis or to gain a broader mastery of a discipline by electing to take coursework in lieu of a thesis.

Doctoral Programs

The University offers doctoral programs in those disciplines that have both the faculty and facilities to support high-quality advanced graduate education. Care has also been taken to ensure that the programs will make a significant contribution to the opportunities for doctoral education in the New England region. Doctoral education properly focuses upon preparing the student to contribute to the growth of knowledge through research. Most doctoral programs also provide opportunities for students to work as teaching assistants and to participate in seminars on teaching led by experienced faculty members. After receiving a dual grounding in the development and communication of knowledge, graduates from UNH doctoral programs have gone on to find excellent teaching and research positions.

Interdisciplinary Programs

The Graduate School encourages and supports interdisciplinary study within existing programs and in the form of new and innovative graduate curricula. While self-designed courses of study are not available at the University, many of our programs offer a range of electives, cross-disciplinary study, and independent projects that allow students to tailor their work to reflect individual interests. This is especially true at the doctoral level. In addition, the Graduate School oversees *intercollege* programs that involve faculty and coursework from more than one school or college. Intercollege programs offer students the opportunity to pursue new and emerging fields of study that draw upon multiple disciplines, leading to solid disciplinary foundations as well as cross-disciplinary skills useful for solving new social and scientific problems. Opportunities for interdisciplinary research are also available in the institutes and centers at the University.

Center for Graduate and Professional Studies

The Graduate School extends its programs and services into central and southern New Hampshire through the Center for Graduate and Professional Studies, located at our urban campus in Manchester. The center offers a wide range of post-baccalaureate programs for professionals in business, technology, education, social services, health care, government, and related fields. All graduate programs supported by the center are directed by UNH faculty. The mission of the center is to bring the resources and expertise of the University of New Hampshire to the population and economic center of the state, to focus and extend UNH's professional education programs, and to further distinguish professional graduate education at UNH.

To achieve this mission, the center is committed to meeting the professional preparation needs of the central and southern New Hampshire region, including the growing public service and technology sectors in northern Massachusetts and southern New Hampshire.

Applying for Admission

Persons holding a baccalaureate degree from an accredited college or university may apply for admission to the Graduate School. Admission is both limited and competitive and is based solely upon academic qualifications and potential of the individual.

Application procedures are included in the application packet, which is available either from the Graduate School, University of New Hampshire, Thompson Hall, 105 Main Street, Durham, NH 03824-3547, or at www.gradschool.unh.edu.

Applicants to programs that lead to the *master of science for teachers* degree must meet, in addition to the normal requirements, one of the following admission requirements: (1) completion of education courses sufficient for certification, (2) completion of three years of teaching experience, or (3) current employment in a full-time teaching position.

All application materials become part of the permanent records of the University of New Hampshire and will not be returned. Access to this material is limited under the Family Rights and Privacy Act of 1974. Applicants who are not admitted, or who are admitted and do not register in the Graduate School, do not have access to their application files. Materials received as part of the application process will not be duplicated for personal use by the applicant or forwarded to a third party. Materials received from applicants who do not complete their application, who are not admitted, or who are admitted and do not register are held for one year before being destroyed.

Applicants from Foreign Countries

All applicants from non–English-speaking countries must, in addition to all of the above, provide TOEFL (Test of English as a Foreign Language) scores. A minimum TOEFL score of 550 (213 computer-based) is required for admission. TOEFL scores are valid for only two years. A financial statement on official University forms is also required.

Applications from residents of foreign countries will be considered only for regular admission.

Application Deadlines

Application deadlines vary by program. These are updated on an annual basis and may be found on our Web site, www.gradschool.unh.edu, as well as in our application packet. Applicants for financial assistance (assistantships and scholarships) should complete their applications prior to February 15 to ensure consideration for the following academic year.

Foreign applicants who are not currently residing in the United States will be considered for admission for the fall session only and must have their applications completed by April 1. Foreign applicants currently residing in the United States should have their applications completed at least four months prior to the session for which they are applying.

Incomplete Applications

Applications that remain incomplete after the first day of classes of the term for which admission was desired will be placed in an inactive status. A written request is required to reactivate an application.

Application Review

Once an application is complete, it is reviewed by an admissions committee of graduate faculty members, which makes recommendations to the Graduate School. The Graduate School will review these recommendations and make the final decision. While applicants with bachelor's degrees may apply directly to certain doctoral programs, the Graduate School also reserves the right to offer applicants admission at the master's degree level in its place.

Admission Categories

Official offers of admission from the Graduate School are made for a specific term and year in one of the following categories. Offers of admission—regular, provisional, or conditional—to applicants who are in the final year of an undergraduate or, in some cases, a graduate degree program are contingent upon the successful completion of that degree program. An official final transcript showing grades and the awarding of the degree must be received by the Graduate School before the student may enroll for the graduate program.

Regular Admission
Regular admission may be offered to applicants whose academic records and supporting documents indicate that they are fully qualified to undertake graduate study in their chosen fields.

Provisional Admission
Provisional admission may be offered to applicants whose academic records and supporting documents indicate that they are qualified to undertake graduate study, but whose undergraduate preparation was not in the intended field of graduate study. Applicants offered provisional admission must meet the specific criteria, usually undergraduate coursework, stated at the time of their admission, before being changed to regular graduate student status.

Conditional Admission
Conditional admission may be offered to applicants whose academic records indicate deficiencies but suggest some promise of success in graduate study. Students offered conditional admission must meet the specific requirements stated at the time of

their admission in order to remain in the Graduate School. Conditionally admitted students are not eligible for assistantships and scholarships offered through the Graduate School until the conditional status is removed.

Deferred Admission
Applicants who cannot enroll in the term for which admission was offered may request to have their admission deferred for up to one year. Such requests must be in writing and will be considered only once. Because enrollments are limited and competition for admission may vary from year to year, such requests may not be granted. Applicants who have received approved deferment of their admission cannot register for graduate coursework as special students at the University during the period of deferment.

Early Admission—University of New Hampshire Seniors
Qualified senior students at the University of New Hampshire may be admitted to the Graduate School provided they have followed normal application procedures; they must have been admitted for the semester in which they wish to enroll in courses for graduate credit. A 3.20 cumulative grade-point average is normally required to be considered for early admission. Such seniors are normally admitted prior to the start of their last undergraduate semester. Seniors who have been admitted under early admission may register for a maximum of two courses for up to 8 graduate credits. (See dual credit on page 14.)

Admission to the 3/2 Program
Undergraduate UNH students may be admitted to one of the approved five-year combined bachelor's degree/master of business administration programs, which normally commence during the fall semester of their senior year. Approved undergraduate programs include the B.S. programs in chemical engineering, civil engineering, electrical engineering, or mechanical engineering in the College of Engineering and Physical Sciences; the B.A. programs in French, history, philosophy, or psychology in the College of Liberal Arts; the B.S. program in plant biology in the College of Life Sciences and Agriculture; and the B.A. program in economics in the Whittemore School of Business and Economics. Application to the Graduate School is made during the second semester of the junior year. Interested students should contact the Whittemore School for specific information.

Additional Information

Special Students
Individuals holding baccalaureate degrees may register for graduate courses on campus through the Division of Continuing Education, or for UNH graduate courses off campus through the University of New Hampshire at Manchester or the College for Lifelong Learning. These individuals are designated as "special students." Special students are not required to file an application for admission to the Graduate School and are not candidates for a graduate degree. Special students are not normally permitted to register as full-time students. (See special-credit rule on page 14.)

Applicants Not Admitted
Applicants who are denied admission may have their applications reconsidered only if they furnish significant additional material that was not available at the time of the original decision, such as evidence of further academic achievement or more recent and significantly improved GRE or GMAT scores. Reapplication is not encouraged.

Registration

Academic Year

Registration information and the *Time and Room Schedule* is available on the Web at www.unhinfo.unh.edu/registrar/registration.html.

Continuous Registration
Unless a leave of absence is granted, graduate students are required to maintain continuous enrollment each semester of the academic year until their degree is formally awarded by registering for course credits, research, or continuing enrollment. Master's students must enroll for course credits, thesis credits, Master's Continuing Research (GRAD 900), or Continuing Enrollment (GRAD 800). C.A.G.S. students must enroll for course credits or Continuing Enrollment (GRAD 800). Pre-candidacy doctoral students must enroll for course credits, Doctoral Research (999), or Continuing Enrollment (GRAD 800). All doctoral candidates must register for Doctoral Research (999) each semester after advancement to candidacy until their degree is conferred, even if the minimum requirement (two semesters) has been met. Students enrolled in summer only programs—currently, Math M.S.T., English M.S.T., and College Teaching M.S.T.—are required to enroll in course credit or GRAD 800 each summer until their degree is formally awarded.

Full-Time Students
Graduate students registered for nine or more credits, Master's Continuing Research, or Doctoral Research are classified as full-time students. Students holding assistantship appointments are also considered full time and must register for a minimum of six credits, Master's Continuing Research, or Doctoral Research each semester.

Three-Quarter-Time Students
Graduate students not on an assistantship and registered for 7 or 8 credits are classified as three-quarter-time students.

Half-Time Students
Graduate students not on an assistantship and registered for 5 or 6 credits are classified as half-time students.

Maximum Load
The maximum graduate load allowed is 16 credits (12 credits for a student on a full assistantship). Only under unusual circumstances will a student be allowed to exceed these limits, and then only with the recommendation of the student's adviser and graduate program coordinator and the approval of the dean of the Graduate School.

Dropping and Adding Courses
Graduate students may add or drop courses in accordance with the procedures and deadlines published by the Registrar's Office in the Time and Room Schedule. Deadlines are also published annually in the Graduate School calendar.

Auditing Courses
A graduate student may, with the approval of his or her adviser and the faculty member concerned, audit courses. The deadline for requesting an audit is Friday of the third week of classes. Subsequent re-

quests for change to audit require a petition form and must be approved by the course faculty member, the student's adviser, graduate program coordinator, and the dean of the Graduate School.

Change of Name or Address
It is the responsibility of the student to complete a change of name or address form whenever a change is made. Forms are available in the Registrar's Office and the Graduate School.

Summer Session

Although many graduate-level courses are offered during the summer session, the University does not guarantee that any particular course will be offered. The availability of individual faculty members to supervise research or to participate in qualifying examinations and final examinations or defenses during the summer session varies from year to year.

Course information and registration materials may be obtained from the UNH Summer Session Registration, Stoke Hall or on the Web at www.learn.unh.edu.

Maximum Load
The maximum graduate load allowed is 12 credits for the entire summer session. A student will be allowed to exceed this limit only by petition with the recommendation of the student's adviser, graduate program coordinator, and the approval of the dean of the Graduate School.

Student Load for Veterans Benefits
Graduate students eligible for V.A. benefits during the summer receive benefits according to the following schedule of average credit registrations: 1/2 credit/week or more = full time; 3/8 credit/week or more = 3/4 time; 1/4 credit/week or more = 1/2 time; less than 1/4 credit/week = tuition and fees only.

Nonregistration

Leave of Absence
Students who, because of unforeseen circumstances, are unable to pursue their graduate program may request a leave of absence for a maximum of one calendar year. Such circumstances may include medical reasons, military obligation, family emergencies, or hardship. The procedure for an approved leave of absence requires that students submit a petition, available at the Graduate School, along with appropriate documentation, prior to the term for which the leave is requested. The dean of the Graduate School, upon recommendation of the student's adviser and graduate program coordinator, will review the petition. If the request for a leave is granted, the time limit for completion of the student's program will be extended appropriately. Students on an approved leave of absence are exempt from paying the continuing enrollment fee. Graduate students who do not return from a leave of absence will have their degree status discontinued.

Withdrawal
A student may withdraw from the Graduate School during any semester by obtaining a withdrawal form from the Graduate School. This form should be signed by the student's adviser and the dean of the Graduate School. Students who formally withdraw are required to apply for readmission if they subsequently desire to resume their academic program.

Degree Status Discontinued
Students who do not formally withdraw and do not register and pay for course credits, research, or continuing enrollment by the appropriate registration deadline, or do not return from an approved leave of absence, will have their degree status discontinued. Students are notified by the Graduate School when this administrative action is taken and are required to apply for readmission or reinstatement if they subsequently desire to resume their academic program.

Administrative Withdrawal for Reasons of Health
The Vice President for Student Affairs or the dean of the Graduate School, in consultation with professional University Health Services officials, may temporarily suspend a graduate student from the University without prejudice for reasons of seriously impaired physical or mental health and/or in consideration of the physical health, safety, and well-being of members of the University community. Such action shall be taken only for bona fide health and safety emergencies and should not be used as a means of excluding qualified students with disabilities.

The dean or designee shall provide the student with a written statement of the reasons for the temporary suspension. The student may request a hearing with the dean or designee to dispute the reasons. The student may be represented at the hearing by a member of the University community. If the student fails to request such a hearing within ten days of beginning the temporary suspension, or if the temporary suspension is upheld at the hearing, the temporary suspension shall be changed to an administrative withdrawal.

Readmission is contingent upon receipt by the directors of counseling and/or health services, or their agents, of a medical release from a licensed attending medical authority; and a personal interview with the Vice President for Student Affairs or designee, who, on the basis of the information received, will either approve or disapprove the application.

Readmission

Students who withdraw, who have their degree status discontinued, or whose time limit has expired and subsequently desire to resume their academic program are required to apply for readmission. Readmission forms are available at the Graduate School. Students who are applying for readmission are required to pay an application fee plus, if readmitted, any accumulated continuing enrollment fees for the period during which they have been inactive. Students are not guaranteed readmission and may be evaluated in competition with current applicants to the program.

Reinstatement
Students who have their degree status discontinued for failure to register and pay for course credits, research, or continuing enrollment may petition the Graduate School to be reinstated for the term in which the action to discontinue their status was taken. Such a petition requires a reinstatement fee, plus payment of current semester charges and late fees.

Change in Degree

Students who wish to pursue a degree program other than the one for which admission was granted originally must complete the appropriate application for a change in degree. This includes students enrolled in UNH master's programs who intend to pursue the Ph.D. in the same department in which they were admitted for the master's degree. These forms are available from the Graduate School or may be downloaded from our Web site at www.gradschool.unh.edu. The dean of the Graduate School will notify the student of the decision after consulting with the appropriate departments.

Residency

Each graduate student is classified as a resident or nonresident for tuition purposes at the time of admission to the University. The decision, made by the Graduate School, is based upon information furnished by the student's application and any other relevant information. Nonresident undergraduates continuing directly to the Graduate School will be classified as nonresidents.

All applicants claiming New Hampshire residency are required to have been legally domiciled in New Hampshire continuously for at least twelve months immediately prior to registering for the term for which in-state status is claimed.

Students admitted from states other than New Hampshire or from foreign countries are considered nonresident throughout their entire attendance at the University unless they shall have acquired bona fide domicile in New Hampshire. Changes in residency for enrolled students as well as appeals are reviewed by the Registrar's Office and will only occur if the student can clearly establish that his or her residence in New Hampshire is for some purpose other than the temporary one of obtaining an education at the University.

The burden of proof in all cases is upon the applicant. In all cases, the University reserves the right to make the final decision as to resident status for tuition purposes. The University rules governing tuition rates are fully set forth in the application for admission package; all students are bound by them.

New England Regional Student Program

The University of New Hampshire participates in the New England Regional Student Program administered by the New England Board of Higher Education. Under this program, admitted graduate students from New England may qualify for regional tuition rates (New Hampshire resident tuition, plus fifty percent) if the program to which they are admitted is one that is not available at their home state university. Inquiries and requests for further information may be directed to the Dean of the Graduate School, UNH, Thompson Hall, 105 Main Street, Durham, NH 03824-3547, or to the New England Board of Higher Education, 45 Temple Place, Boston, MA 02111; the Web address is www.nebhe.org.

Sub-Degree Exchange Program

The Graduate School participates in a sub-degree exchange program sponsored by the New England land-grant universities. The program is designed to provide any admitted student at one of the six land-grant universities access to the full range of talent and resources available in the region. Under the agreement, graduate students may, with the approval of the dean of the Graduate School at UNH, and the graduate dean of the host university, take advantage of courses or other special resources not available at UNH. Specific information about the program may be obtained from the Dean of the Graduate School, UNH, Thompson Hall, 105 Main Street, Durham, NH 03824-3547.

Tuition and Fees

Tuition and fees are established by a vote of the Board of Trustees. Approval normally occurs between April and July. The current academic year rates are published annually on our Web site at www.gradschool.unh.edu. Mandatory fees for all students include a Memorial Union fee, which funds the personnel, programs, and maintenance of the building; a health and counseling fee, which funds University Health Services and the Counseling Center; a recreation fee, which funds recreational sports facilities; and a technology fee, which funds technology services and support for students and faculty. The services and facilities are available to all and students are required to pay all mandatory fees charged regardless of actual usage of the programs and services. Tuition and fees are due by the published deadline; and students are not considered registered until they have paid. Graduate tuition and fees apply to admitted graduate students enrolling for courses, graduate or undergraduate, at the University during the academic year. Admitted graduate students planning to enroll for UNH courses off campus through executive programs or during the summer session should consult the relevant publications for information regarding tuition and fees.

Special Fees

Continuing Enrollment Fee
Students registered for Continuing Enrollment (GRAD 800) will pay $100. This fee will be waived for students who subsequently register for course credits or research within the semester.

Master's Continuing Research Fee
Master's students registered for Master's Continuing Research (GRAD 900) will pay $300 plus full mandatory fees.

Doctoral Research Fee
Doctoral students in residence and registered for Doctoral Research (999) will pay $500 plus full mandatory fees. Students who register for coursework in addition to Doctoral Research will pay the appropriate additional tuition charges up to the appropriate maximum tuition rate for full-time students. Doctoral candidates not in residence who are conducting their research away from the Durham campus may petition the Graduate School for a waiver of the mandatory fees.

Differential Tuition
Students majoring in business administration, computer science, economics, and engineering will be charged a tuition differential. Students in these programs who are registered for Doctoral Research (999) or Masters-Continuing Research (GRAD 900) are considered full time and pay the full tuition differential. The current academic year rates are published annually at www.gradschool.unh.edu.

Tuition Waiver for Senior Citizens
Any New Hampshire resident senior citizen who submits evidence of being 65 years of age or over, and whose participation is not intended for economic improvement, will be allowed to take courses at UNH with the tuition waived. Such waivers shall cover the cost of tuition only and are limited to a maximum of 8 academic credits per semester for each eligible individual. Admission into particular courses will be granted on a space-available basis, at the discretion of the graduate dean. All other costs of attendance are to be borne by the student.

Other Charges and Fees

Overload
Graduate students are charged full tuition plus the appropriate course charge for each credit beyond 16 if registered for more than 16 credits thirty days after the semester has begun. (No refund will be made if a student subsequently drops a course, reducing his or her course load to 16 or fewer credits.) Tuition waivers awarded with assistantships and scholarships do not cover charges for overload.

Zero-Credit Seminars
Seminars for 0 credit are billed as if they were for 1 credit.

Audit
Charges for auditing a course are the same as those for taking it for credit.

Late Fees
A $25 late registration fee is charged to students who register after the last day scheduled for graduate registration. Late fees are also charged for changes in registration as follows: A $25 fee is charged for each course dropped after the third Friday of classes; a $25 fee is charged for each course added after the third Friday of classes. The late-add fee is charged in addition to the reinstatement fee when students register after the third week of classes. A change of section (within the same course) is accomplished by a "drop" of one section and an "add" of another section. The fee will not be assessed for the add portion of a late section change; but the $25 drop fee will still apply for the drop portion of the late section change.

Reinstatement Fee
A $50 reinstatement fee is charged to any student who has his or her degree status discontinued and subsequently petitions to be reinstated during the same semester that the action to discontinue the degree status was taken. This fee will not be waived.

Registration Fee
Part-time students (i.e., those registering for 1 to 8 credits) pay a nonrefundable registration fee.

Student Accident and Sickness Insurance
The University strongly urges all students to be insured against illness or injury that may arise in the course of the academic year. International students are required to have insurance. A student accident and sickness insurance policy is available for all students. Graduate students may enroll in this insurance program on a voluntary basis during graduate registration or through University Health Services. The cut-off date for enrollment is the second Friday following graduate registration. Insurance coverage is also available for the spouse or children of a student, provided the student is also enrolled in the plan. For information on student and/or dependent insurance, call University Health Services at (603) 862-1530.

Refunds

Tuition during the academic year is refundable in accordance with the calendar published in the Time and Room Schedule and the Graduate School calendar. Students receiving federal financial aid will have their refund calculated in accordance with the U.S. Department of Education regulations in effect at the time of their withdrawal. Specific details regarding the regulations are available in the UNH Financial Aid Office. Mandatory fees are nonrefundable.

Financial Aid

Several forms of financial assistance are available to graduate students through the Graduate School and individual departments, most of which are awarded for an academic year commencing in the fall. To be eligible for any assistance, the student must first be admitted to the Graduate School. The Graduate School normally administers and awards the fellowship and scholarship programs. Assistantships and associateships are normally awarded by the individual graduate programs. In some cases, the application for admission with supporting documents serves as the application for new graduate students for the scholarship and assistantship programs available to them. In other cases, individual departments have their own application forms for assistantships and associateships. Applications for aid should be completed by February 15 for awards for the following academic year. *Students are strongly advised to contact individual programs for more information about assistantships and associateships, and any departmental application forms.*

The Tax Reform Act of 1986 (TRA '86)
TRA '86 made all scholarships and fellowships taxable income to the recipients, except for that portion used by degree candidates for the payment of tuition and course-required fees, books, supplies, and equipment (as opposed to other expenses like room and board). Compensation for service, which includes assistantship stipends and work-study awards, is fully taxable. Tuition waivers awarded to graduate students on assistantships are considered to be nontaxable scholarships.

Lifetime Learning Education Tax Credit
The Lifetime Learning education tax credit is among the recent changes in the tax laws that are designed to make college education more accessible and more affordable for low and moderate income families. The following will give you a general overview of the program.

The Lifetime Learning credit is for expenses incurred for any post-secondary education. There is no limit on the number of years this credit may be claimed. An individual may claim an income tax credit for 20 percent of qualified tuition and fees for himself or herself, a spouse and dependents. This credit cannot be used for expenses incurred for books, room and board or other expenses. Before calculating the credit, the

taxpayer must deduct any scholarships and other tax-free financial assistance, including a distribution from an Education IRA and employer-provided educational assistance. Beginning July 1, 1998 through December 31, 2002 the maximum yearly credit is $1,000 (i.e., up to $5,000 of qualified expenses may be taken into account). Beginning in 2003, the amount of eligible education expenses increases to $10,000, resulting in a $2,000 maximum tax credit. The Lifetime Learning credit is taken in the year the expenses are paid. The credit covers a broad range of schooling. The student may be enrolled full-time, half-time or less than half-time and be taking undergraduate or graduate level courses. The credit is available to taxpayers whose income is under $100,000 if filing a joint return or $50,000 if filing a single return.

Scholarships and Fellowships

Graduate Scholarships for Merit
The Graduate School maintains a limited number of scholarships to reward students for outstanding potential and/or performance in a graduate program. Availability and criteria for award of these scholarships are announced annually by the Graduate School.

Scholarships for Full-Time Students
Students who are full-time may be granted full or 1/2 tuition scholarships for the academic year or semester. These awards provide for waiver of tuition and are subject to the maintenance of a high scholastic record in the Graduate School. Application is made to the student's department or program.

Scholarships for Part-Time Students
Students who are part-time may be granted tuition scholarships which provide a partial waiver of tuition charges. The scholarships are awarded each semester of the academic year. Applications are available at the Graduate School. University employees or family members who are eligible for staff benefits are not eligible to receive scholarships for part-time students.

Dissertation Fellowships
Dissertation fellowships for a maximum tenure of one academic year are available on a competitive basis to doctoral students who have been advanced to candidacy. These awards include a stipend and a waiver of the doctoral research and mandatory fees for the period of the award. Application is made to the dean of the Graduate School.

Summer Fellowships for Teaching Assistants
A limited number of summer fellowships are awarded to students who have held graduate assistantships involving teaching during a previous academic year. These awards are in the form of a stipend for a period of two months in the summer. Application is made to the dean of the Graduate School.

Assistantships

Graduate appointments are made to postbaccalaureate students who have been admitted to the Graduate School and who have been recommended by the appropriate department or program and approved for appointment by the Graduate School. Appointments are normally for one academic year and may be renewed provided that funds are available and that the student's academic performance, as well as performance in carrying out the responsibilities of the appointment, is satisfactory. Students are normally involved in assistantship activities for twenty hours a week during the academic year unless otherwise specified in the appointment. All graduate students holding appointments must be enrolled as students in order to hold an appointment during the academic year. Assistants, associates, fellows, or lecturers must register for a minimum of six course/thesis credits, Master's Continuing Research or Doctoral Research during each semester in which they hold their appointments. Interns/trainees must register according to terms specified in their contracts. Students holding only a nonstatus appointment must register for course/thesis credits (no minimum), Master's Continuing Research, or Doctoral Research. Students registered for Master's Continuing Enrollment (GRAD 800) are not eligible to hold an appointment. Students holding summer appointments have no required enrollment unless specified by their appointment.

Inquiries regarding assistantships should be addressed to the chairperson or graduate coordinator of the appropriate department or program. Appointments may be made in the following categories.

Graduate Assistants
Graduate assistants are students who provide instructional or administrative support as specified by the appointing department and are normally supported by University funds. Graduate assistants also receive tuition waivers for the period of their appointment and the following summer.

Graduate Research Assistants
Graduate research assistants are students who are appointed to conduct research on grants supported by the Agricultural Experiment Station, or external grant or contract. Graduate research assistants also receive tuition waivers for the period of their appointment.

Graduate Research Associates
Graduate research associates are doctoral candidates who because of their advanced standing and experience are appointed to conduct research on grants supported by the Agricultural Experiment Station or external grants and contracts. Research associates also receive a tuition waiver during the period of their appointment.

Graduate Associates
Graduate associates are doctoral candidates who because of their advanced standing and experience are appointed to teach one or two courses per semester and are normally supported by University funds. Graduate associates also receive a tuition waiver during the period of their appointment.

Graduate Part-Time Lecturers
Graduate part-time lecturers are master's, C.A.G.S., or precandidacy doctoral students who, because of their specific expertise, are appointed to teach one or two courses per semester, and are normally supported by University funds. Tuition waivers are not usually provided.

Graduate Interns/Trainees
Graduate interns/trainees are students who are assigned to a specifc project or subject area to acquire additional learning experiences and are normally supported by external funds. Tuition waivers may be awarded in accordance with the terms of their appointment.

Graduate Fellows
Graduate fellows are students who have been awarded a fellowship normally through an external grant to the University of New Hampshire or directly to the student. Appointment will normally not

exceed one fiscal year and may be renewed in accordance with the terms of the fellowship program. Tuition waivers may be awarded according to the terms of the fellowship.

Graduate Nonstatus Appointments
Graduate nonstatus appointments are appointments made to students during the academic year under one of the above categories. Such appointments may supplement regular appointments for up to an average of five hours per week (twenty hours per week when classes are not in session), or may be appointments with responsibilities of less than those of regular graduate appointments in terms of level of service, level of stipend, or both.

Graduate Summer Appointments
Graduate summer appointments are appointments made to students during the summer in one of the above categories. Students on summer appointments may work for up to forty hours per week. Graduate students working full time on research or combined teaching and research for the entire summer earn 2/3 of their prior academic year stipend. Appointments for less than the maximum time are prorated.

Other Forms of Aid

Limited amounts of aid from federal sources are available through the Financial Aid Office. This office distributes money from various sources to help students with financial need. Need is defined as the difference between what it costs to attend UNH and what the student and his/her family can contribute from their financial resources, including all other sources of assistance. The student is expected to earn a portion of these resources. The Free Application for Federal Student Aid (FAFSA) should be submitted to the federal processor listed on the envelope as soon after January 1 as possible, but prior to March 1 for priority consideration for the academic year. The FAFSA is required for all of the programs listed below with the exception of the Veterans Benefits. For further information or copies of the forms, contact the Graduate Financial Aid Coordinator, Financial Aid Office, Stoke Hall at (603) 862-3600.

Federal Perkins Loans
Graduate students may borrow up to $30,000, including any undergraduate loans. These loans have a simple interest rate of five percent annually. Minimum payments of $40 per month are required, and the repayment period may extend up to ten years. Repayment and interest do not begin until six months after the student ends at least half-time study. To be eligible for consideration, students must carry at least five academic credits per semester, be citizens or permanent residents of the U.S., and establish need for a loan which is to be used for educational purposes only.

Federal Work-Study Program
With the aid of federal funds, the University is able to provide employment opportunities on campus or in non-profit off-campus agencies. To be eligible, a graduate student must be an admitted degree candidate carrying at least a half-time (five credits) academic load and demonstrate financial need as determined by the Financial Aid Office. Students interested in work should send their FAFSA to the federal processor as soon after January 1 as possible, but prior to March 1. Those interested in the Summer Federal Work-Study program need to submit a separate Summer Work-Study application as well as the FAFSA. The Summer Federal Work-Study application may be obtained in the Financial Aid Office around the 1st of March. You do not need to be enrolled in summer classes to be considered for Summer Work-Study.

UNH Loans
Students who are registered degree candidates are eligible for consideration for a UNH loan. Financial need must be demonstrated clearly, and loans may be used only for educational expenses. No interest is charged until separation from the University occurs. Interest is 5 percent on any unpaid balance and repayment begins nine months after separation from the University. The maximum amount granted to a student is $1,000 during his or her undergraduate and/or graduate work.

Federal Stafford Loan Program
A federal Stafford loan is a low-interest loan made to a student-borrower by a bank, credit union, or savings and loan association and is based on financial need. The interest rate varies; it is capped at 8.25%. Graduate students may borrow up to $8,500 per academic year. The total maximum debt for graduate study is $65,000 including Stafford loans at the undergraduate level.

Borrowers have the interest on their loans paid by the federal government while attending college. Repayment begins six months after students cease at least half-time attendance.

Unsubsidized Federal Stafford Loan Program
Unsubsidized Federal Stafford loans are non-need-based Stafford loans for students who do not qualify in whole or part for the subsidized federal Stafford loan. The student borrower, *not the federal government*, is responsible for paying the interest that accrues while he or she is in school, and during grace and deferment periods. To apply for an unsubsidized Stafford loan, you must first submit a Free Application for Federal Student Aid (FAFSA) form even though this loan is not based on financial need. Graduate students may borrow up to $18,500 per academic year in subsidized and unsubsidized loans. The total maximum debt for graduate study is $65,000 including Stafford loans at the undergraduate level.

Veterans Benefits
Veterans and their dependents should investigate their eligibility for veterans benefit payments. Questions may be addressed to any local Veterans Administration office or the UNH Veterans Coordinator, Registrar's Office at (603) 862-1595.

Satisfactory Academic Progress
Satisfactory progress in a course of study must be maintained by all students who receive federal financial aid. The current standards for satisfactory academic progress are available upon request from the Financial Aid Office.

It is the student's responsibility to become familiar with the academic regulations and degree requirements of the Graduate School as well as the special requirements of his or her own academic program. The general requirements of the Graduate School are found in the catalog. Individual program requirements may be found in the catalog or obtained from the respective department.

Academic honesty is a core value at the University of New Hampshire. The members of its academic community both require and expect one another to conduct themselves with integrity. This means that each member will adhere to the principles and rules of the University and pursue academic work in a straightforward and truthful manner, free from deception or fraud. The academic policy can be found in the annual publication, *Student Rights, Rules, and Responsibilities.*

Graduate Courses

Graduate credits may be earned in courses numbered from 800 through 999. The faculty of each graduate program prescribes the courses that make up the degree program. In addition, the Graduate School has general requirements for master's and doctoral degree programs.

800- and 900-Level Courses
These courses are offered for graduate credit only and therefore are open only to admitted or special graduate students.

700-Level Courses
These are advanced undergraduate courses. Up to 12 credits earned in 700-level courses may be taken for graduate credit by a graduate degree student, provided such courses are approved by the student's adviser, graduate program coordinator, and the dean of the Graduate School, and provided they are given in a program other than the one in which the student is seeking the degree. Such courses must be taken for a letter grade. Petition forms are available at the Graduate School.

Graduate Grading

Every instructor must be prepared to discuss and explain the basis for her or his evaluation of students. If, after consulting the instructor, a student still believes that he or she was treated unfairly, he or she has the right to seek redress from the chairperson of the department or program in which the course is offered. Under exceptional circumstances, a final appeal may be made to the dean of the college or school in which the program is offered.

The following grades are used at the University: A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F. Graduate credit is normally granted only for coursework completed with a grade of B- or higher. Individual programs may have stricter requirements for major courses.

AF Grades An "AF" grade, Administrative F, is assigned for failure to either drop or complete the course. An AF is considered a failing grade.

C, C+ Grades The dean of the Graduate School may, under limited conditions, approve up to 8 credits of C or C+ grades for graduate credit. When a student's advisory committee or a student's adviser, in conjunction with the appropriate departmental committee, wishes to recommend that credit be given for work completed with a C or C+, the advisory committee shall forward its recommendation, with appropriate justification, to the dean of the Graduate School within one month after conclusion of the course. Normally these courses will be elective courses outside the student's major area.

Credit/Fail Grades A "CR" grade is given for complete, approved theses and dissertations, as well as other approved courses and seminars.

A graduate student may petition to take graduate independent study courses (800/900 level), as well as undergraduate courses, on a credit/fail basis. Such a petition must be approved by the end of the add period for the term the course is taken. Courses at the 700 level approved for graduate credit cannot be taken for credit/fail.

Audit Grades An "AU" grade is assigned for completion of courses for which an audit was granted. No credit is earned.

Incomplete Grades An "IC" grade is assigned with the approval of the instructor for excused unfinished work only. The work must be completed and submitted to the instructor by the last day of classes of the semester immediately following the one in which the incomplete was granted (800- and 900-level courses only; midsemester for 400-, 500-, 600-, and 700-level courses). A petition requesting additional time within which to resolve the incomplete, approved by the instructor, the student's adviser and graduate program coordinator, may be submitted to the Graduate School by the appropriate deadline. An extension will be granted by the dean only under unusual circumstances. An incomplete grade automatically becomes an F if not resolved or if a petition for an extension is not approved within the allowed time period. This policy also applies to students who withdraw from the University or who are in an approved leave of absence.

IA Grade An "IA" grade is assigned for approved continuing courses such as thesis or doctoral research and remains on the record until the course requirements are completed.

W Grades If a student withdraws from school or drops a course prior to the fifth Friday of classes, the course(s) will not

appear on the student's permanent record. If a student withdraws from school or, for compelling nonacademic reasons, submits an approved petition to drop a course after the fifth Friday of classes, a notation of "W" will be shown on the student's academic record. If the withdrawal or drop is after midsemester, a WP/WF is shown on the record. A WF is considered a failing grade.

Academic Standards

Grades below the B- level, including grades of C or C+ that may have been approved for graduate credit, will, for the purposes of determining academic standing, be considered failing grades. Failing grades (below B-) received in undergraduate courses taken while the student is enrolled in the Graduate School are counted in the cumulative total of failing credits. Repeating a course does not remove the original failing grade from the record.

Graduate students receiving failing grades in nine or more credits will be dismissed from the Graduate School. Students on a conditional status must meet the conditions as stated in their letter of admission in order to remain in the Graduate School.

Each individual program may set and announce standards for coursework and research achievement that are more rigorous than the Graduate School standard. Thus, students may be dismissed if they accumulate less than nine credits of failing grades and/or fail to make adequate progress in other aspects of their graduate program.

Dual Credit

UNH Seniors
University of New Hampshire seniors who have been admitted to the Graduate School under early admission (see page 7) may, upon recommendation of the department and approval of the Graduate School, be allowed a maximum of two graduate-level courses for up to eight credits, to count toward both a bachelor's and master's degree. Dual credit forms must be completed and approved by the dean of the Graduate School at the beginning of the semester for which dual credit is sought. Dual credit forms are available at the Graduate School.

Transfer Credit

Candidates for the master's degree and the Certificate of Advanced Graduate Study (C.A.G.S.) may request that a maximum of two courses, for up to eight semester credit hours of resident courses completed on the campus of an accredited institution authorized to grant graduate degrees, be transferred to count toward their graduate program. All courses presented for transfer must have been completed with a grade of B or better and must have been taken for graduate credit. Courses cannot be transferred for credit if used in earning another degree. Transfer of credits must be recommended by the program faculty and approved by the dean of the Graduate School. Students taking courses at another university for transfer after enrolling at UNH should obtain approval of their adviser and the graduate dean prior to enrolling in the course.

Special Student Credits

Special-Credit Rule
A maximum of three courses for up to 12 credits completed by a special student in University of New Hampshire graduate courses may, upon recommendation of the program faculty and approval of the dean of the Graduate School, be applied to a student's degree program. The 12-credit limitation applies to all courses completed or in process on the date when the official letter of admission is written. This number could be reduced if transfer credits are also applied.

Off-Campus Courses

Credits earned off campus will be applied toward a graduate degree only if recommended by the major program and approved by the Graduate School. UNH courses offered off campus that are not listed in the *Graduate Catalog* or specifically approved by the dean of the Graduate School will not be approved for graduate credit.

Twelve-Credit Off-Campus Rule
A maximum of 12 credits, not including thesis, may be earned in UNH courses taken off the Durham campus. Credits earned off campus by a special graduate student will be counted as part of the 12 credits. Credits transferred from another university will also count as a part of the 12 credits allowed.

Exceptions to the 12-Credit Off-Campus Rule
Students who are admitted to external graduate degree programs offered through the Center for Graduate and Professional Studies or UNH Manchester are exempt from the 12-credit off-campus rule.

Students who are admitted to all other graduate degree programs are subject to the 12-credit off-campus rule. Exceptions for these students may be granted on a course-by-course basis. Courses taught by regular members of the graduate faculty of UNH may be approved for exception to the 12-credit off-campus rule. The Graduate School maintains a list of the approved courses. It is the responsibility of students who have reached the 12-credit maximum to check with their adviser to see if the desired course(s) can be applied toward their degree program, and with the Graduate School to see if the course has been approved for exception to the 12-credit off-campus rule.

Master's Degree Requirements

Credits
A minimum of 30 graduate credits is required for all master's degrees. Many programs require substantially more than the minimum 30 credits. Individual program requirements are outlined in the program descriptions of this catalog. Graduate credits are normally earned in courses numbered 800–999. Up to 12 credits earned in courses numbered 700–799 may be taken for graduate credit by master's degree students provided the courses are approved by the dean of the Graduate School and given in a department other than the one in which the degree is sought. A maximum of 12 credits taken by a student prior to admission can be applied to a degree program.

For more information about graduate studies at UNH visit our Web site at
www.gradschool.unh.edu

Residency
A student will normally spend at least one calendar year, or the equivalent, in satisfying the requirements for the degree.

Master's Continuing Research
Master's students who have completed all course requirements and have previously registered for the maximum number of thesis or project credits and are in residence completing their master's program must register for Master's Continuing Research.

Time Limit
All graduate work for any master's degree must be completed within six years from the date of matriculation (admission/enrollment) in the program. Progress toward the degree will be carefully monitored by the adviser and the Graduate School to ensure that adequate advancement is made toward the completion of the program and that any deficiencies noted at the time of admission are removed.

Nonthesis Option

Students who are in a nonthesis program may be required to pass a final examination. This examination may be oral, written, or both. A candidate will be permitted only two opportunities to take the final examination for the master's degree. The schedule of final examinations will be at the convenience of the department concerned, except that all such examinations must be given at least two weeks before the graduation date at which the degree is to be conferred. Further regulations governing the final written examination, when required, will be made by the department concerned, subject to the approval of the dean of the Graduate School.

Examining Committee
Examining committees, when required, are appointed by the dean of the Graduate School, upon recommendation of the department or program concerned. Normally three members are required. The dean of the Graduate School is an ex officio member of all examining committees.

Thesis Option

Students who are in a thesis program are required to conduct independent research and prepare a scholarly paper for submission to the Graduate School. Each department will determine the date when the student must submit for approval a statement of the subject of the thesis and the date when the thesis must be completed. Students writing a thesis

should obtain a copy of the *Thesis and Dissertation Manual* from the Graduate School. Students in thesis programs may also be required to pass a final examination. The regulations concerning this exam are the same as those in the nonthesis option. The thesis committee will normally also serve as the examining committee.

Thesis Credit
A student completing a thesis must enroll for a minimum of six thesis (899) credits (8 credits in economics, mechanical engineering, and political science). A maximum of 10 thesis credits may be applied toward a master's degree. The exact number of credits within this range to be applied toward the degree will be determined by the faculty of the individual programs. No thesis credit shall be given until the completed thesis has been approved by the thesis committee and accepted by the Graduate School. Satisfactory acceptance of the thesis will be recorded as a credit (CR).

Thesis Committee
A master's thesis must be approved by a committee composed of the faculty member under whose direction it was written and two other members of the graduate faculty nominated by the department chairperson or graduate program coordinator and appointed by the dean of the Graduate School.

Submission of Thesis
Two copies of the approved thesis, ready for binding, must be submitted to the Graduate School Office by the appropriate deadline as published in the Graduate School calendar. Binding fees will be paid at the Graduate School and are due upon submission of final copies. Most programs require one additional copy of the thesis.

Certificate of Advanced Graduate Study

Requirements for completion of the Certificate of Advanced Graduate Study are found under the program descriptions of the education department. A maximum of 12 credits taken by a student prior to admission to the C.A.G.S. can be applied to a C.A.G.S. program.

All graduate work for the C.A.G.S. must be completed within six years from the date of matriculation (admission/enrollment) in the program.

Doctoral Degree Requirements

The degree of doctor of philosophy is conferred on qualified candidates who have passed an oral or written examination(s) on the subject matter of their field of study, who have completed an original investigation in this field and have embodied the results in an acceptable dissertation, and who have passed an oral examination in defense of the dissertation. The degree of doctor of philosophy is essentially a research degree.

Credits
Each program specifies the number of courses required for the Ph.D. degree.

Residency
A minimum of three academic years of graduate study is required for the doctorate. Resident graduate work done at other universities may be counted toward the minimum requirement upon approval of the guidance committee and the dean of the Graduate School, but one full academic year must be in residence at the University of New Hampshire. In individual cases, the major department and the dean of the Graduate School may grant permission to pursue the research for the dissertation at another institution where access to special facilities would be advantageous.

Doctoral Research
A minimum of two semesters of registration in Doctoral Research is required. However, doctoral students at candidacy must register for 999 each semester during the academic year, even if the minimum requirement has been met.

Guidance Committee
A guidance committee is appointed by the dean of the Graduate School upon the recommendation of the program faculty as

soon as possible after a student has begun study for the doctoral degree. The committee assists the student in outlining a program and preparing for the qualifying examination, and administers the examination.

Qualifying Examination
The qualifying examination is required and may be written, oral, or both. This examination will test (1) the student's general knowledge in the student's major and minor work and (2) the student's fitness for engaging in research, particularly in the subject proposed for the dissertation. The chairperson of the student's program will communicate the examination results to the Graduate School dean.

Language/Research Proficiency
Each doctoral program has its own language and/or research proficiency requirements. These requirements can be found in the individual program descriptions.

Degree Candidacy
A doctoral student is advanced to candidacy for the degree by the dean of the Graduate School upon recommendation of the graduate program coordinator after the student has passed the qualifying examination, met the language or proficiency requirements as are deemed desirable by the student's program, and declared a topic for dissertation research.

Doctoral Committee
After the student has been advanced to candidacy, a doctoral committee will be appointed to supervise and pass on the dissertation and administer the final examination. This committee will be nominated by the department of major concentration and appointed by the dean of the Graduate School. It shall consist of a minimum of five members, usually three from the major department and two from related departments. The dean of the Graduate School is an ex officio member of all doctoral committees.

Time Limit
All graduate work for the doctorate must be completed within eight years of the beginning of doctoral study, unless the student entered with a master's degree in the same field, in which case the doctorate must be completed within seven years. The beginning of doctoral study is defined as the beginning date of the earliest course applied to the doctoral record. The student must be advanced to candidacy within five years of the beginning of doctoral study or within four years if the student entered with a master's degree in the same field.

Dissertation
The dissertation must be a significant contribution to scholarship in the student's discipline, demonstrating the student's ability to conduct independent and original research and to communicate the results of the research through a coherent, integrated, and mature piece of writing.

Final Defense
A copy of the completed dissertation must be made available to the members of the examining committee two weeks before the final examination date.

The final oral examination is conducted by the doctoral committee and is intended to give the candidate an opportunity to defend the dissertation. A written final examination, on subject matter not covered in the qualifying examination, may also be required. This written examination is conducted by the major department. These final examinations must be completed by the date listed in the Graduate School calendar. After consultation with the major program, the dean of the Graduate School may appoint, for participation in the final oral examination, additional members of the faculty under whom the student has worked. The doctoral committee alone shall decide on the merits of the candidate's performance by a majority vote.

Submission of Dissertation
Three copies of the approved dissertation, ready for binding, must be submitted to the Graduate School Office by the appropriate deadline in the Graduate School calendar. Binding, microfilming, and copyright fees will be paid at the Graduate School and are due when the final copies are submitted. Most departments require one additional copy of the dissertation. Students should consult their advisers concerning dissertation requirements.

Publication of the dissertation by University Microfilms is required, and the student assumes the cost. Students may choose to copyright their dissertation at the time of microfilming. If the dissertation material is further published, it should be designated as having been accepted as a doctoral dissertation by the University of New Hampshire.

Graduation

Students must file an Intent-to-Graduate card with the Graduate School by the appropriate deadline specified in the Graduate School calendar. Specific information is available at the Graduate School.

All coursework completed prior to the official conferral of the degree will be applied only to that degree program.

Deadlines for graduation are listed in the Graduate School calendar and each semester's *Time and Room Schedule*. While graduation occurs three times a year, the annual commencement ceremony is held in May. Doctoral candidates must have completed all requirements for the Ph.D. degree including submission of the final copies of the dissertation by the deadline in order to participate in the ceremony.

The University's research projects range from highly specialized investigations in the physical and biological sciences to broad interdisciplinary studies. Graduate students are involved in research as project assistants working on research leading to master's theses and doctoral dissertations. Research and educational activities are conducted not only in individual departments but also in multidisciplinary research centers and institutes.

The Office of Intellectual Property Management (OIPM) is charged with the responsibility to manage UNH's intellectual property in accordance with UNH's Intellectual Property Policy. Graduate Students are covered by this policy as "University members" and are required to follow this policy. The OIPM is located in the Environmental Technology Building and should be contacted with any question concerning intellectual property.

Research at UNH is conducted according to ethical principles provided by professional associations, and federal regulations and guidelines. Accordingly, UNH has institutional policies governing the conduct of research, including, but not limited to, the use of animal subjects, human subjects, and hazardous materials, misconduct, and financial conflict of interest. Graduate students conducting research as part of their coursework and/or thesis/dissertation work are expected to read and be familiar with these institutional policies *prior to* planning and implementing research activities. This is especially important for research involving animal or human subjects, or hazardous materials, as institutional approval is required *before* work may proceed. Institutional policies and further information are available at www.unh.edu/osr/regulatory/Regulatory_Compliance.html or by contacting the UNH Office of Sponsored Research Regulatory Compliance Office at (603) 862-2003.

Advanced Polymer Laboratory

This laboratory, part of the Materials Science program, is dedicated to solving challenging problems relevant to both the academic and industrial worlds by combining engineering and chemistry in the context of polymer science. Problem solving is done through the optimal combination of fundamental science and well-designed experiments. For information: www.unh.edu/apl.

Agricultural Experiment Station

The New Hampshire Agricultural Experiment Station is one of the largest research and service units at the University. It is responsible for all research in the College of Life Sciences and Agriculture. This research is funded jointly by the State of New Hampshire and the U.S. Department of Agriculture as well as grants from other federal and private agencies.

Scientists and graduate students associated with the Agricultural Experiment Station carry out research to solve important problems affecting agriculture, forestry, the social and economic well-being of the people of New Hampshire, the region, and the nation. Projects are designed to optimize a blend of applied and basic research related to agriculture, forestry, and the improvement of the quality of life for rural communities. For information: www.colsa.unh.edu/acs.htm.

Browne Center

The Browne Center is an internationally recognized teaching, training, and research site for professional development. It is an auxiliary enterprise of the Outdoor Education Program that can provide students with unique opportunities for teaching, training and research. Other externally funded projects are also expected for other potential research endeavors (e.g., the use of adventure experiences as therapy for families, the use of experiential learning techniques in the classroom, and the use of adventure activities with corporate populations). For information: www.brownecenter.com.

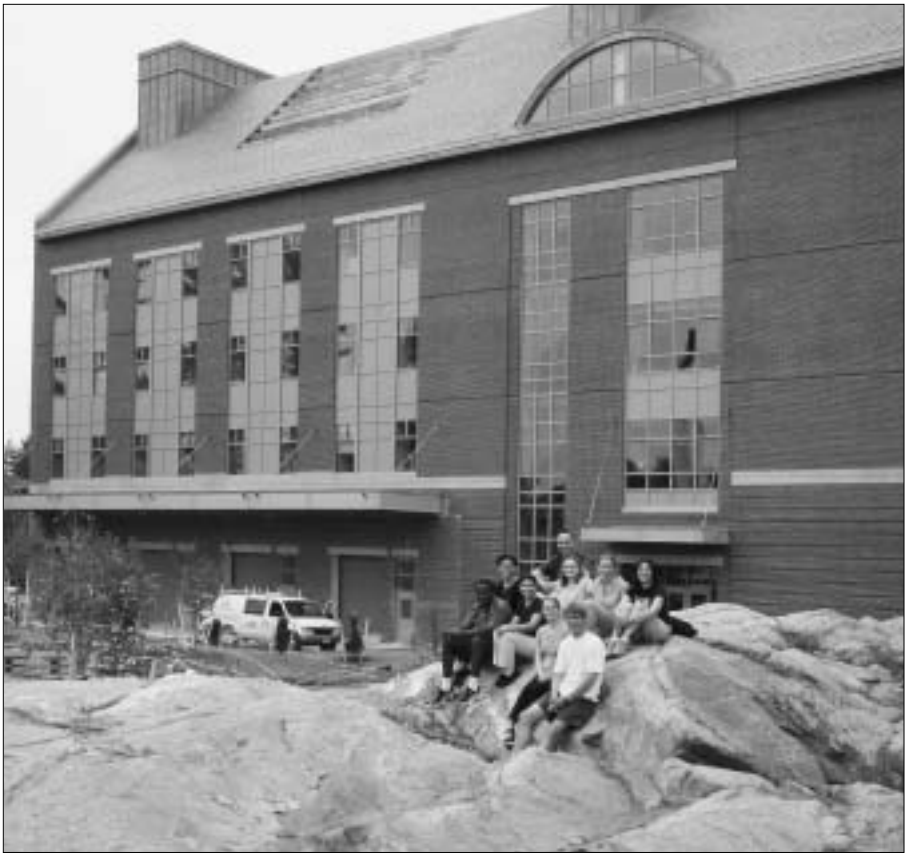
Center for Business and Economic Research

The Center for Business and Economic Research supports applied research on business and economic affairs, especially the linkages between public policy and regional economic development. Recent projects have looked at industrial development at the Pease International Tradeport, availability of affordable housing in New Hampshire, the potential impact of a natural gas pipeline on local economics in northern New England, and the impact of competition from a major retail chain on local businesses.

In addition to conducting scholarly research, the Center helps clients find qualified business and economic consultants and hosts visiting scholars from around the world. For information: orbit.unh.edu/cber/over.htm.

Center for Coastal and Ocean Mapping/Joint Hydrographic Center

The Center for Coastal and Ocean Mapping (C-COM)/Joint Hydrographic Center (JHC) is a University of New Hampshire program aimed at creating a national center for expertise in ocean mapping and hydrographic sciences. Guided by a



Memorandum of Understanding with the National Oceanic and Atmospheric Administration (NOAA), the JHC operates in partnership with NOAA's National Ocean Service. The C-COM is a University center that expands the scope of interaction and cooperation with the private sector, other government agencies and universities. The center focuses on two major tasks: an educational task, aimed at creating a learning center that will promote and foster the education of a new generation of hydrographers and ocean mapping scientists; and a research task aimed at developing and evaluating a wide range of state-of-the-art hydrographic and ocean mapping technologies and applications.

The center's graduate degree program in ocean mapping has been awarded Category A Recognition by the International Federation of Surveyors/International Hydrographic Organization (FIG/IHO) Advisory Board on Standards of Competence for Hydrographic Surveyors. Category A Recognition is the highest level of international recognition. For information: www.jhc.unh.edu.

Center for the Humanities

The University of New Hampshire Center for the Humanities inspires and nurtures innovative research, teaching, and public service in fields that are the heart of a liberal education. Working with the study of literatures, languages, history, philosophy, the arts, communication, and culture itself, the center consists of a small staff, many faculty associates, an endowed chair, and resident faculty fellows, all engaged in collaborative or individual research and other innovative projects. The center hosts and sponsors faculty research fellows, research conferences, faculty seminars, lecture series, and many public programs.

The center's fundamental purpose is to create an environment for humanities research and teaching that flourishes at the University and to share the accomplishments and intellectual riches of humanities faculty with the communities beyond the University campus.

The center's *Encyclopedia of New England Culture* project recently received grants from the National Endowment for the Humanities, an anonymous foundation, and the University of New Hampshire Parents Association.

The Center for the Humanities is located in Huddleston Hall, on the campus of the University of New Hampshire, Durham, NH 03824. For information: www.unh.edu/humanities-center/.

Center to Advance Molecular Interaction Sciences

The Center to Advance Molecular Interaction Sciences (CAMIS) is a resource serving academia and the pharmaceutical, biotechnology, and material science industries. The center provides a dynamic environment in which researchers from the academic and industrial communities interact with UNH students and CAMIS personnel. The center advances the scientific understanding of molecular interactions through the development of new methods and instruments and transfers CAMIS technologies through training, consultation, and collaboration. For information: www.camis.unh.edu.

Child Study and Development Center

The Child Study and Development Center is a laboratory school affiliated with the Department of Family Studies at the University of New Hampshire. A laboratory school is one with both an early care and education mission and an academic mission. Children attending the center, and the UNH students working at the center, benefit from the highly trained teaching staff and from the family studies faculty. The center is supported by its tuition revenues and by University funds. The center operates four programs: an Infant-Toddler Program, a Preschool Program, a kindergarten, and a Nursery School Program.

Each year more than one hundred students enrolled in family studies courses at UNH use the center as a laboratory for experimental teaching and learning, and documentation of those experiences. Students from other disciplines, for example, education, psychology, occupational therapy, and communication disorders, also use the center as a laboratory for the study of children.

The center's seven classrooms are equipped with observation booths that are used by college students, faculty, parents, and visitors. These booths provide researchers with the opportunity to observe children in a natural context. Research projects have ranged from the effects of infant child care on attachment to the development of emergent literacy. For information: www.unh.edu/csdc/geninfo.htm.

Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET)

The Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) was established in 1997 as a national center for the development and application of innovative environmental technologies for monitoring, management, and prevention of contamination in estuaries and coastal waters. The Institute is a unique partnership between the University of New Hampshire and the National Oceanic and Atmospheric Administration (NOAA), and promotes collaboration among academia, government, and the private sector. CICEET's role is that of developing innovative and transferable technologies and techniques directly applicable to the management of estuarine and coastal systems, placing significant emphasis on getting information and technology into the hands of end users and decision makers and ensuring the implementation of technologies. For information: ciceet.unh.edu.

Cooperative Institute for New England Mariculture and Fisheries (CINEMar)

In July 2000, the National Oceanic and Atmospheric Administration and the University of New Hampshire entered into a Memorandum of Understanding (MOU) to establish the Cooperative Institute for New England Mariculture and Fisheries (CINEMar). CINEMar grew out of the UNH Open Ocean Aquaculture Demonstration Project, a multi-disciplinary and multi-institutional program in offshore aquaculture research and development that began in 1997. The mission of CINEMar is to serve as a regional and national center at which representatives from universities, industry, federal and state programs, and non-governmental organizations may work together on issues in three broad program areas: (1) mariculture, (2) fisheries, and (3) marine policy. CINEMar provides a facility for research, development, and demonstration of open ocean mariculture in New England; provides opportunities for collaborative problem solving in marine fisheries; and leads efforts to include explicit consideration of socioeconomic impacts on stakeholders during the development of management strategies, regulations, and legislation.

The CINEMar program supports graduate students, undergraduate students and provides partial support for faculty.

Crimes Against Children Research Center

The mission of the Crimes Against Children Research Center (CCRC) is to combat crimes against children by providing high quality research and statistics to public policy makers, law enforcement personnel, and other child welfare practitioners. CCRC is concerned with research about the nature of crimes including child abduction, homicide, rape, assault, and physical and sexual abuse, as well as their impact.

Children and adolescents have among the highest rates of conventional crime victimization and, in addition, suffer from some crimes like sexual abuse and family abduction specific to childhood. Despite enormous publicity about crime and youth, however, this high vulnerability is seldom mentioned. The disproportionate number of youthful offenders is much more widely recognized than the disproportionate number of victims. For information: www.unh.edu/ccrc/index.html.

Dairy Teaching and Research Center

The Dairy Teaching and Research Center is a key component in UNH's efforts to provide the state with a well-prepared agricultural work force. The center consists of a tie-stall barn for one hundred milking cows with many added features such as a milking parlor that permits electronic recording of milk weights and other data, a gravity-flow manure system, and natural ventilation. Graduate study is conducted on the nutritional needs of dairy cows through the Department of Animal and Nutritional Sciences.

Environmental Research Group

The Environmental Research Group (ERG) conducts externally sponsored research in partnership with industry, communities, federal agencies, and international organizations. Its sixteen full and associate members come from three departments (Civil Engineering, Microbiology, Chemical Engineering), reflecting the necessary interdisciplinary team approach to problem-solving in today's world. For information: www.unh.edu/erg.

The group specializes in three areas:

- advanced water treatment technologies (particularly for small systems);
- groundwater processes and bioremediation; and
- waste characterization and utilization.

Research is undertaken on other issues when expertise is sought by New Hampshire communities or firms.

Areas of research activity include:

The **Bedrock Bioremediation Center** is the focus for research on ground water processes and bioremediation. The group continues to pursue support for both basic science and applied research in this area via strong relations with federal agencies.

The **Contaminated Sediments Center** is developing expertise in the area of contaminated sediment characterization and remediation; as developments occur, additional information will be posted to the ERG Web site.

The **Recycled Materials Resource Center** concentrates on ensuring that such use will be free of unexpected long-term environmental consequences. The goal is to make recycling possible in ways that produce physical performance at least as good as with traditional materials, at the same or lower cost.

A related activity is UV research in water treatment. Reports about the **UV Groundwater Research** activity and the UV team activity will be evolving on the ERG Web site over time.

ERG leads an international **Waste Utilization Consortium** involved in a number of ongoing projects related to waste characterization and utilization activities.

The **Water Treatment Technology Center Group** focuses on the need of small communities and firms for reliable, affordable systems for drinking water.

Graduate and undergraduate education are strong components of the ERG's mission. Graduate students obtain an M.S. or Ph.D. in environmental engineering through the Civil Engineering Department. Many graduates have been recognized for the quality of their thesis work or academic performance in national competitions. ERG alumni are located nationwide in a variety of positions—from consulting engineer, to field scientist, to regulator. For information: www.unh.edu/erg.

Family Research Laboratory

The Family Research Laboratory (FRL) devotes itself to understanding family violence and the impact of violence in families.

As public and professional interest in family violence has grown, so has the need for more reliable knowledge. The FRL has tried to fill that need in a variety of ways: through comprehensive literature reviews, new theories, and methodologically sound studies. Researchers at the FRL pioneered many of the techniques that have enabled social scientists to estimate the scope of family violence. These efforts have brought international recognition to the FRL.

The FRL is unusual among research centers in this field because it includes all aspects of family violence and abuse. For information: www.unh.edu/frl.

Industrial Research Center

The center matches the intellectual and technical resources of the University with the needs of business and industry. The center's primary resources are the faculty and students of the University and draws upon these resources to organize teams that study complex research problems.

Center-funded projects provide support to graduate, undergraduate, and post-doctoral students. Projects are typically one to three years in duration, and are focused on applied research, the development of intellectual property and its transfer to New Hampshire companies in order to create jobs and enhance the strength of the New Hampshire economy. For information: www.nhirc.sr.unh.edu.

Institute for Policy and Social Science Research

The Institute for Policy and Social Science Research (IPSSR) operates at the University of New Hampshire within the College of Liberal Arts to serve two goals: facilitate innovation of the teaching and research programs of the University, and help to focus the intellectual resources of the school on important problems of the community.

The institute has its main office in Thompson Hall on the Durham main campus. It assists in the management of the Browne Center, which provides offices, seminar rooms, dining, and team-building training facilities on 103 acres of field and forest 3.5 miles south of town. For information: www.unh.edu/ipssr.

Institute for the Study of Earth, Oceans, and Space

The Institute for the Study of Earth, Oceans, and Space (EOS) is a multidisciplinary research institute devoted to the study of the planet Earth and its space environment. The nationally and internationally recognized faculty and programs at the institute provide a wide range of opportunities for graduate study.

At the heart of the graduate study experience is participation by students in the advanced research being conducted at the institute. Graduate programs, at the master's and doctoral levels, emphasize interdisciplinary studies that contribute to understanding the global, integrated processes governing the evolution and dynamics of the Earth system, and the evolution and dynamics of stars—particularly the Sun.

Areas of intense research activity at the institute include:

Atmospheric Chemistry
Field and laboratory studies focus on understanding the distribution, sources, and fate of atmospheric gases and particles, and their role in global climate. Current field research utilizes ground and aircraft measurements in New England, the Western and South Pacific, South and Central America, and polar and alpine regions.

Climate Change
Physical and chemical climate variability is investigated over a wide range of temporal and spatial scales to better understand the causes, mechanisms, and impacts of climate change. Research focuses on the collection and analysis of instrumental climate data as well as proxy climate information (e.g., from ice cores, lake and marine sediments, speleothems, or tree rings). Field sites range from New England to the Himalayas and both poles.

Global Biogeochemistry and Ecosystems
Data from satellite sensors, field measurements and computer models are used to address topics such as global cycling of water and carbon, impact of air pollution on ecosystems, and the role of terrestrial and ocean systems in regulating atmospheric composition and global climate.

High Energy Astrophysics
Investigations of the high energy processes in the solar system and beyond involve the measurement of both high energy photons and energetic cosmic rays. EOS research concentrates on experimental activities, with supporting theoretical studies which aid in interpretation of the experimental results. Measurements are performed using ground-based detectors as well as balloon and satellite platforms.

Ocean Sciences
Investigations focus on understanding and predicting the biological, chemical and physical dynamics of water and ecosystems in estuarine, coastal, and open ocean environments. Current studies include satellite observation of phytoplankton productivity; molecular analysis of diversity and dynamics of zooplankton populations; chemical studies in estuarine, coastal, and mid-ocean hydrothermal environments; and observation and modeling of physical dynamics in the coastal ocean.

Space Plasma Physics
Investigations of the Earth's environment in our solar system utilize Space as a laboratory for plasma physics. Teams of EOS scientists study the solar-terrestrial radiation environment with ground, rocket, and satellite instruments and with supporting theory.

A number of departmental and cross-department degree programs are available to students mentored by EOS-affiliated faculty. Graduate students have access to the strong academic resources of the University, and its College of Engineering and Physical Sciences and College of Life Sciences and Agriculture. Every effort is made to provide financial support to all students. Research assistantships and competitive fellowships are available. For more information on current research themes and projects, degree programs, and faculty profiles, visit: www.eos.unh.edu.

Institute on Disability

The mission of the Institute on Disability is to promote the full inclusion of people with disabilities into their communities. To carry out that mission the Institute on Disability conducts a wide variety of activities.

The staff of the Institute on Disability work at all levels to address issues from birth through adulthood including early care and education, elementary and secondary education, family support, transition and adult life, employment, housing, assistive technology, aging, and other areas. The Institute on Disability has been instrumental in helping establish the Hood Center for Family Support at the Dartmouth-Hitchcock Medical Center and the Institute for Health, Law, and Ethics at Franklin Pierce Law Center in order to provide true strength in statewide transdisciplinary training and research. The Institute on Disability has also been a key partner in the evolution of New Hampshire's service system for individuals with disabilities.

E-mail the Institute on Disability at: institute.disability@unh.edu or visit: iod.unh.edu.

InterOperability Lab

The IOL is a unique organization which has two distinct missions:

The first mission is externally focused and is to provide testing services for vendors of computer communications devices. The IOL is involved in research and development work, but is mainly used by a community of more than 100 vendors to verify the interoperability and/or conformance of their computer communications products.

The second mission is internally focused and is to provide educational and employment opportunities for qualified UNH undergraduate and graduate students. The IOL affords a unique opportunity for students to be educated in one of the fastest growing and most challenging fields, computer communications. The IOL has created a rigorous training program in data communications and computer networking which allows students to gain a broad knowledge of several communications technologies through the mastery of industry standards, classwork, hands-on experience with state-of-the-art equipment, and interaction with industry leaders. For information: www.iol.unh.edu.

Marine Program

The UNH Marine Program supports research, education, and service projects involving the estuarine, coastal, and deep ocean environments. It is closely tied to graduate academic programs in a wide range of disciplines and gives special emphasis to interdisciplinary programs that enhance the strengths of academic units of the University. The Marine Program includes the Center for Marine Biology, the Center for Ocean Engineering, the Center for Ocean Sciences, the University Diving Program and University research vessels. For information: marine.unh.edu.

Center for Marine Biology
The Center for Marine Biology fosters marine biological research and graduate education, and maintains a set of research laboratories and specialized facilities, such as the Image Analysis Lab. The center also provides the funding to support graduate student research projects and travel to scientific meetings.

Researchers associated with the Center for Marine Biology study diverse marine-related topics that are of importance to the state or region, or of national or international scope and significance. All faculty members are also affiliated with academic departments, through which marine-related graduate and undergraduate degree programs are available. Much of the Center for Marine Biology's research is conducted at the following laboratories:

The **Jackson Estuarine Laboratory** is located on Great Bay about five miles from campus and fourteen miles from the ocean. The laboratory supports research in estuarine science including ecology, sedimentary geology, marine microbiology, and aquaculture of estuarine species.

The **Coastal Marine Laboratory,** a running seawater facility, is located about fifteen miles from campus at Fort Constitution, New Castle. It serves as a location for a wide variety of research projects which require a reliable supply of clean ocean water. Many coastal diving expeditions leave from this laboratory.

The **Anadromous Fish and Aquatic Invertebrate Research Laboratory,** located on campus, is a running freshwater facility designed for the maintenance and rearing of anadromous fishes and freshwater invertebrates.

Center for Ocean Engineering
The Center for Ocean Engineering (COE) provides for an integration of academic and research missions in Ocean Engineering. Home to OE faculty and graduate students, this organization enables the graduate student to access the center's facilities as well as other learning opportunities and facilities found in the Marine Program, such as the diving program and research vessel fleet, achieving strong interdisciplinary flavor.

The research agenda is concerned with the effective and wise utilization of the coastal ocean, extending from the estuary out to the limits of the Exclusive Economic Zone, encompassing hydrodynamic modeling, fluid structure interaction, acoustics, measurement systems, and data analysis and interpretation. The focus is on solving real engineering problems in the ocean.

Center for Ocean Sciences
The Center for Ocean Sciences (COS) is composed of faculty members from a variety of disciplines whose research addresses critical questions concerning the coupled atmosphere/ocean/land system. Physical, chemical, geological, and biological oceanographers join with ocean and atmospheric geochemists in research efforts that seek to unravel the complex processes that are important on estuary, coastal ocean, open ocean, and global Earth scales.

The COS academic research programs involve graduate and undergraduate students. While they emphasize both direct and remote observation of the marine environment, oceans, and atmosphere, there is a growing effort to integrate observations with relevant models. COS research also benefits from access to several modern laboratories including labs for ocean remote sensing, ocean process modeling, and automated DNA sequencing.

Research Vessels
The R/V *Gulf Challenger* is a 50-foot research vessel equipped for a wide variety of marine research activities in the estuary and near-coast waters. In addition, there are several outboard skiffs available for research purposes which are berthed at the Jackson Estuarine Lab and the Coastal Marine Lab.

University Diving Program
The diving program offers introductory and advanced instruction in SCUBA diving, supervises safety of diving operations by UNH students and staff members, and maintains a hyperbaric chamber for research use. This program provides the essential logistic support to all University sanctioned diving activities, both academic and research.

Marriage and Family Therapy Center

The Marriage and Family Therapy Center provides assistance to individuals, couples, and families experiencing a wide range of personal or relationship problems. The center is committed to a treatment approach in which individual growth and development is best understood and promoted within the context of family and community relationships. The center recognizes societal diversity and embraces a cross-cultural approach in support of the worth, dignity, potential, and uniqueness of each individual. For information: www.unh.edu/family-studies/mft.html.

Therapists are advanced graduate students who specialize in marital and family therapy. They are supervised by senior staff who are all clinical members and approved supervisors of the American Association for Marriage and Family Therapy (AAMFT). Therapists and supervisors are committed to high standard of professional competence and integrity. For more information on AAMFT or the ethical standards that drive our practices visit: www.aamft.org.

New Hampshire Industries Group

The mission of the New Hampshire Industries Group is to further knowledge of industrial and economic competitiveness and facilitate endeavors that advance growth and development. The group's primary "customers" are corporate decision-makers and public officials; their approach is driven by empirical research and writing that will generate publications which advance theory and application in industrial competitiveness and economic development. For information: www.unh.edu/management/nhind/nhind.htm.

New Hampshire Small Business Development Center

The New Hampshire Small Business Development Center (NHSBDC) works with hundreds of local and regional business owners each year on a variety of issues, providing a wide range of services and information from local offices around New Hampshire.

The NHSBDC offers free, one-on-one, confidential business counseling, low cost training programs, and access to information and referral. Specialized services include environmental counseling, manufacturing assistance, international trade programs, and innovative economic development initiatives. For information: www.nhsbdc.org.

New Hampshire Water Resource Research Center

The New Hampshire Water Resource Research Center (WRRC) serves as a focal point for research and information on water issues in the state and region. The NH WRRC was established under the provision of the Water Resource Research Act of 1964 (PL 88-379).

There is one such institute in each state, located at a land grant university, and one in each of our four dependencies (Virgin Islands, Guam, Puerto Rico and Washington, D.C.). For information: www.wrrc.unh.edu.

Non-Lethal Technology Innovation Center

NTIC's mission is to identify and develop materials and technologies that can produce the next generation of non-lethal weapons. The Joint Non-Lethal Weapon Directorate (JNLWD) has a mission to provide advanced non-lethal capabilities for deployment in peacekeeping, conventional warfare, anti-terrorism, policing, humanitarian assistance, disaster relief, and noncombatant evacuation operations carried out by U.S. military. To support this mission, the University of New Hampshire and the JNLWD have begun a partnership for the purpose of providing the U.S. military and law enforcement agencies with access to the nation's best research professionals. For more information visit the Web page at www.unh.edu/ntic.

Office of Sustainability Programs

The Office of Sustainability Programs (OSP) was established in 1997 to manage University-wide programs and projects that define and integrate sustainability practices across all facets of the University. OSP collaborates with faculty, administrators, staff, and students to link the emerging values, science, and norms of sustainability to student and professional development. OSP-sponsored projects involve curriculum and research development, campus environmental practices, and partnerships with local, regional, and international communities.

Graduate student opportunities include project-based hourly work and assistantships. Current project areas include initiatives in climate education, biodiversity education, sustainability, food, society, and culture. For information: www.sustainableunh.unh.edu/.

Polymer Research Group

Established twenty years ago, the Polymer Research Group (PRG) is part of the Materials Science program and is committed to work on research problems of interest to both industry and academia. For information: www.unh.edu/prg.

Preparing Future Faculty (PFF) Program

Inaugurated in 1993 as a cooperative effort of the Association of American Colleges and Universities (AAC&U) and the Council of Graduate Schools (CGS) with support from the Pew Charitable Trusts, the national PFF program began with the broad goal of improving graduate and undergraduate education. The University of New Hampshire was one of fifteen institutions that received funding in 1997 to create an institutional PFF program. In 2000, the Department of Psychology was awarded a PFF grant from the American Psychological Association to further develop and disseminate its nationally recognized efforts in preparing doctoral students for faculty positions.

The Preparing Future Faculty (PFF) program at the University of New Hampshire is a cooperative project of the Graduate School and the Teaching Excellence Program. PFF is designed to provide graduate students with the necessary tools to become successful faculty members. The program includes faculty mentoring opportunities; teaching courses with faculty supervision; conducting research on college teaching; direct, personal experience with diverse institutions; learning about the emerging and future expectations of faculty; a monthly breakfast roundtable; and seminars. The PFF program is intended to enhance, rather than replace, current models of graduate education. For information: www.gradschool.unh.edu/pff/pffhome.html.

To insure that students in the PFF program understand institutional differences, partnerships have been developed with institutions that are very different from UNH. The UNH PFF partner Institutions are Howard University, Keene State College, St. Anselm College, University of New Hampshire Manchester, and Dartmouth College.

Robert J. Connors Writing Center and Writing Across the Curriculum Program

The Robert J. Connors Writing Center serves graduate students in several ways. Graduate students may visit the center to receive feedback on their course assignments, research and grant proposals, applications for advanced study and résumé writing, and thesis and dissertations at any stage of the writing process. As partners with the Preparing Future Faculty Program and the Teaching Excellence Program, the Writing Across the Curriculum Program provides consulting services, workshops, and seminars for graduate teaching assistants on designing effective writing assignments, using portfolios, and responding productively to student writing. Graduate students also act as consultants in the writing center and across the disciplines. Graduate students have used the Robert J. Connors Writing Center as a research site to study writing in the disciplines, online peer consulting, service learning, tutorial discourse, and other topics. For information: www.unh.edu/writing.

Sea Grant Program

The University of New Hampshire Sea Grant Program provides support, leadership, and expertise for marine research, education, and outreach in northern New England. The NH Sea Grant Program is one of a network of thirty in the nation. The program is dedicated to promoting the understanding, development, wise use, and conservation of ocean and coastal resources through University-based research, education, and outreach. There is opportunity for graduate students to become involved in nearly all projects supported by Sea Grant.

The NH Sea Grant Program works with marine industries, government agencies, private organizations, and individuals to identify and solve problems associated with the conservation and development of the region's marine resources. Through its information, education, and public service efforts, the program increases awareness of marine and coastal issues and promotes responsible use of these resources. For information: marine.unh.edu/seagrant.htm.

Speech-Language-Hearing Center

The clinic provides speech-language services to the University and seacoast community. As part of a student's education program, the clinic offers a broad range of state-of-the-art diagnostic and speech-language therapies to individuals of all ages. The clinic also provides graduate students in communication disorders with valuable research and clinical experience.

Teaching Excellence Program

The goal of the University Teaching Excellence program is to assist permanent and part-time faculty and teaching graduate students who wish to become more effective and efficient teachers. It is a service-oriented University-wide program staffed and administered by faculty for faculty. Peer commitment and support are essential to its success.

The Teaching Excellence program receives funding from a variety of foundations and in 1995 received funding from FIPSE to develop a program in college teaching in cooperation with the Graduate School. In 2001, additional funding was received to establish and support funding for the Partnership for Academic Programs in College Teaching (PACT) and the Engineering Education Scholars Program.

Sponsored by the Fund for the Improvement of Post Secondary Education (FIPSE), U.S. Department of Education, PACT is a diverse network of institutions which include: University of Connecticut, University of Maine, Howard University, Syracuse University, The Colleges of Worcester Consortium, and Tufts University Department of Computer Science. Faculty from PACT institutions collaborate in the delivery of existing courses, both in traditional classroom settings and via the Internet. Since all courses are open to faculty as well as graduate students, they offer doctoral students an opportunity to engage with faculty in a shared inquiry into the processes of teaching and learning. For information: www.unh.edu/teaching-excellence.

Writing Lab

The Department of Education's Writing Lab distributes information about the teaching and evaluation of reading, writing, and other areas of literacy to school districts, administrators, regional educational organizations, colleges and universities, local communities, adult education groups, and libraries. The information is gleaned from research conducted by professors, graduate students, and teachers who work through the Writing Lab.

The Campus

The home of the main campus of the University is in Durham—one of the oldest towns in northern New England—near the picturesque seacoast of New Hampshire. Students have found Durham to be an ideal place to live while completing a graduate degree at UNH. For those interested in cultural pursuits, Boston is a quick sixty-five miles to the south. Outdoor enthusiasts will find skiing, hiking, and the scenery of the White Mountains 60 miles to the north and the sandy beaches and rocky coast of New Hampshire and Maine ten miles east.

The 200-acre campus is surrounded by more than 2,400 acres of fields, farms and woodlands owned by the University. A stream flowing through a large wooded area in the middle of campus enhances the natural open space among the buildings.

College Woods, on the edge of campus, includes five miles of well-kept paths through 260 acres of woods.

UNH Library

The University of New Hampshire library consists of the main Dimond Library, four specialized branch libraries, an extensive government documents collection, and the Douglas and Helena Milne Special Collections and Archives. In addition to over a million volumes and 6,000 periodical subscriptions, the library has maps, sound recordings, compact discs, video cassettes, DVDs, manuscripts and other related materials. Electronic resources, including indexes in a wide variety of subject areas, databases supplying full-text periodical and newspaper articles, electronic journals, and statistical data sets, enhance the versatility of materials and services available to users. Experienced librarians and staff provide expert service to people seeking information or research assistance.

Recently expanded and completely renovated, Dimond Library combines the best traditions of the 19th century with the information access of the 21st. It offers three grand reading rooms, seating for 1,200 students and other researchers, computer workstations on every floor, numerous laptop computer hookups throughout the building, laptops for loan available at the Reserve Desk, and 21 miles of shelving for books. The library has a graduate study area (check with the main desk for availability). Interlibrary Loan can obtain materials that the library does not own. The library can borrow from libraries worldwide.

The four branch libraries specialize in science, mathematics, and engineering. The Biological Sciences Library is located in Kendall Hall, the Chemistry Library is in Parsons Hall, Engineering/Mathematics/Computer Science Library is in Kingsbury Hall, and the Physics Library is in DeMeritt Hall. All branches have reserve materials, reference collections, circulating collections, periodicals, and electronic resources. All branch materials are indicated in the UNH library online catalog.

For the latest information on Dimond Library and the branches, consult the library Web site at www.library.unh.edu.

Computing and Information Services (CIS)

Computer Access

All students have access to networked computing resources on campus. UNH has three microcomputer clusters which offer more than 220 Dell pentium and Apple Macintosh computers as well as high-speed laser printing. All clusters are completely networked and offer a suite of software as well as access to the Internet via the World Wide Web. The clusters are staffed by student consultants who assist with questions or problems. Three clusters are available 24 hours a day. There is also one cluster which provides access to UNH's central systems via terminals. For information and cluster hours, call (603) 862-0058 for an automated recording.

Training

A teaching/learning center in Hamilton Smith Hall provides students with a library of videotapes of the most popular software programs available in the student computing clusters. Students can borrow these videotapes free of charge. Each semester short courses are offered on a variety of topics. Register for a short course via the Web at training.unh.edu. Facilities with Dell pentium and Apple Macintosh systems can be reserved by faculty and students for hands-on training. For more information, call (603) 862-3667.

Purchase and Repair

Students can purchase their own computers at the UNH Computer Store. The UNH Computer Store offers Apple, Dell, and Acer computers; Apple, Epsom, and Hewlett-Packard printers; and a variety of supplies, peripherals, and software at educational pricing to members of the UNH academic community. Warranty service and computer maintenance and repair are provided through the Computer Service Center. The UNH Computer Store and the Computer Service Center are located at the CIS Center, Hewitt Annex, 54 College Road.

CIS Help Desk and Dispatch Center

The CIS Help Desk provides UNH and USNH faculty, students, and staff with a centralized point of contact for computer-related questions and concerns. Telephone consulting is available at (603) 862-4242 to address inquiries on a variety of computer applications. Supported products include Macintosh and Windows compatible software, communications, and network products, Internet utilities, central computing applications, and USNH central administrative software applications. In addition to supporting applications, the Help Desk provides administration and support for all central UNH computer user accounts as well as assisting with problems connecting to the UNH central computer systems.

Walk-In Services

The CIS Help Desk coordinates Walk-In Services at the MUB, room 109. This convenient location offers kiosks for accessing e-mail, browsing the Web, and searching the CIS Knowledge Base. Staff are available to discuss issues related to computing at UNH; distribute central system (e-mail) accounts; reset passwords; provide virus scanning services, file conversion, disk/file repair and recovery. CD Loaner Kits are available for the distribution of the latest anti-virus software and network software programs used at UNH.

ResNet
ResNet is UNH's Residential Network which provides a high-speed network connection for each student living in the residence halls on campus. There are no monthly fees or time limits for using ResNet. There are minimum standards for hardware and software. For additional information, visit the ResNet site at www.unh.edu/resnet/.

UNHINFO
UNH's main Web server functions as the starting point to search for and find any on-line University information such as: events, jobs, courses, directories, departments, and much more. UNHINFO is accessible to any computer with a network connection, including the student computing centers, dorms, and Internet service providers, at www.unh.edu.

Organizations

Graduate students are an integral part of the University community, yet they have needs and interests that differ from other University groups. The Graduate School, the University, and the Graduate Student Organization have worked in concert to provide graduate students with access to facilities and organizations that meet their diverse needs and interests.

Graduate School
The staff of the Graduate School is available to assist students in both academic and personal matters affecting their study at the University. Students are urged to contact the office with questions about academic policy, financial assistance, and University services available to graduate students. The offices of the Graduate School are located in Thompson Hall. For information: www.gradschool.unh.edu.

Graduate Council
The Graduate Council, comprising of ten graduate faculty members and three graduate students, advises the dean of the Graduate School on policies concerning graduate education and is responsible to the graduate faculty for recommendations concerning new graduate programs. Standing committees of the council include the doctoral program committee, the master's program committee, and the student affairs committee.

Graduate Student Organization

The Graduate Student Organization (GSO) serves to provide a collective voice for the more than two thousand graduate students who form an integral part of the University community. Graduate students, due to the focused nature of their work, often find themselves involved with only one small area of the University, and therefore it is the GSO that allows for graduate student participation in the University as a whole and fellowship with graduate students in all departments and schools of the University. The GSO provides a representative structure for the graduate student body, advocates for graduate student concerns, serves as an all-purpose resource concerning graduate student life both on and off campus, sponsors special events and social opportunities, fosters open communication between graduate students, faculty, and administration, and monitors issues which directly impact graduate students.

The GSO maintains a board comprised of representatives from each approved graduate program, helps to find graduate student representatives for various University boards and committees, maintains communication among graduate students through its listserv and its Web page at www.gradschool.unh.edu/gso/gsowelcome.htm, and publishes a newsletter, "The Grad Voice."

Facilities and Services

Graduate Student Residences

Babcock Hall
Babcock Hall provides on-campus housing and a sense of community for full-time graduate students. Babcock lies within easy walking distance of all major classroom buildings as well as the University library, computer clusters, and the Memorial Union Building. Babcock itself is a center for both academic and nonacademic graduate student activities.

Six-story Babcock can accommodate 180 persons on coed or single-sex wings. The general atmosphere is quiet but sociable. A common TV and social lounge with tables and comfortable seating is located on each floor. On the ground floor, students can relax in front of the fireplace in the main lounge, unwind with a game of ping-pong in the recreation room, or check out sports equipment for use outside. Other facilities in the hall include a piano, locked bicycle storeroom, coin-operated laundry, vending machines, luggage storage areas, and individual mailboxes. All student rooms are single occupancy. Each room is furnished with a bed, easy chair, desk and chair, wardrobe, clothing drawers, medicine cabinet, and mirror.

A full-time hall director lives in a ground-floor apartment. Five resident assistants, one on each floor, assist in administration and programming and can provide information on University policies and personal services available to graduate students. Babcock also has a house council with elected representatives.

Following acceptance to the Graduate School, each student will be contacted about housing by the University's Department of Housing, Pettee House, University of New Hampshire, 14 Garrison Avenue, Durham, NH 03824-3558.

Forest Park Apartments
Forest Park Apartment Complex provides campus housing for newly appointed faculty members, married students, and students with dependent children. The community at Forest Park is diverse, with students and faculty members from all over the world. The six and one-half acre complex contains 153 apartments and is located on the southern edge of campus, within close walking distance from all UNH academic and administrative buildings and Durham's shopping and business district. The two and three story apartment buildings within Forest park house 154 studio (efficiency), one-bedroom, and two bedroom apartments.

For more information regarding eligibility and application procedures please contact: Forest Park Manager, 160 Forest Park, University of New Hampshire, Durham, NH 03824 or visit: www.unh.edu/housing/forestpark.html.

Summer Housing
Rooms in Babcock House are available to graduate students taking courses during the summer. Students interested in summer accommodations should contact the Department of Housing Pettee House, University of New Hampshire, 14 Garrison Avenue, Durham, NH 03824-3558, or complete and return the Summer Housing Application Form in the Summer Session Bulletin.

Off-Campus Housing/Resources
Off-Campus Living Student Services is located in the Resource Center, 122 MUB, 862-0303. Students can locate roommates and vacant housing at www.unhmub/housing/index.html. Also available are advocacy and advice, local information, sample forms/agreements, and resources to assist students' transition to a new area. The Resource Center also includes services for student organizations, programming about societal issues, and Greek life.

Dining Facilities

All graduate students are eligible to purchase meal plans for dining hall meals. Babcock House has limited communal cooking facilities, none in individual rooms. Students may choose among a variety of dining plans. These plans may be owned separately or in conjunction with a declining balance debit account known as Cat's Cache, which may be used to purchase meals, supplies, and services in the Memorial Union Building as well as dining hall meals and snacks at the MUB Food Court, New England Center Acorns Restaurants, UNH Dairy Bar or Wildcatessen. Dining plans and debit accounts are administered electronically through a magnetic stripe on the student's University ID card.

For further information about UNH Dining Services or Cat's Cache, please contact UNH Dining, 20 Stillings Hall, 20 Ballard Street, Durham, NH 03824-3555, (603) 862-1821.

Recreation Programs and Facilities

The Department of Campus Recreation offers a comprehensive selection of activities including intramurals, sport clubs, noncredit instructional and fitness classes, and informal recreation. Graduate students are encouraged to put to full use the facilities, equipment, and imagination of the recreation staff. They can gain access to all activities by using their student ID. There is a nominal fee for part-time, non-fee-paying students.

Informal Recreation

The informal recreation program offers graduate students the opportunity to participate in self-directed recreational activities—a chance to relax, get some exercise, or do whatever they like to get away from it all. Activities include basketball, volleyball, swimming, skating, racquetball, squash, tennis, jogging, weight lifting, indoor soccer, floor hockey, and the Fitness Center. Hours of operation for the Indoor Pool can be obtained by calling 862-3400. Throughout the academic year, the Hamel Recreation Center is open Mondays–Fridays, 6 A.M.–midnight, Saturdays 10 A.M.–10 P.M., and Sundays 10 A.M.–midnight.

Intramurals

The intramural program consists of competitive individual and team sports. The program includes men's and women's intramural sports, co-rec intramural sports, and special events. To learn more about the program, contact the recreation staff in the Hamel Recreation Center. Graduate students have the option of participating in the student or faculty/staff leagues.

Sport Clubs

Sport clubs provide an opportunity to stay in shape and develop athletic skills for competition and demonstrations. Some clubs are intensely competitive and require daily commitments to workouts and conditioning. Others meet on a casual, come-when-you-can basis. See the Campus Recreation calendar for the times of organizational meetings.

Noncredit Instructional, Fitness, and American Red Cross Programs

The campus recreation department offers a variety of individual and group activities designed to assist students in reaching their personal fitness goals. These programs will teach new skills and build upon those one already has. Certifications are available in CPR, first aid, and aerobics instruction. Group exercise classes in aerobics, step, slide, cardio-boxing, and Reebok cycling are free of charge.

Employment

The recreational sports department hires approximately 350 students to officiate intramurals, teach fitness classes, and assist with the supervision of facilities for open recreation. For more information, call (603) 862-2031 or visit www.unh.edu/recreation.

Memorial Union

The Memorial Union provides numerous programs for students and the larger University community. The union, a gift of UNH alumni/ae and the only official state war memorial, is the University's community center. It provides opportunities for student involvement in a casual atmosphere and offers space for programs, meetings, and study.

The Memorial Union Building (MUB) hosts many major events, film presentations, and other entertainment. It houses the Information Center, University

Bookstore, UNH Copy Center, Granite Square Station (postal center), Computing Help Desk, MUB ticket office, games room, and several meeting rooms and lounges. Food establishments include the Food Court and the Coffee Office. The numerous activities and facilities offer students employment opportunities in a friendly atmosphere from early morning to late at night. Many student organizations operate in the MUB including WUNH FM 91.3; *The New Hampshire*, the student newspaper; and the Memorial Union Board of Governors.

Information Center

The Information Center in the Memorial Union Building provides information services for students, faculty, staff, and the University community. Lists of available rental houses, apartments, rooms, and names of people looking for roommates are published weekly. The off-campus housing list is on the Internet at www.unh.edu/mub/. Other services include a Ride Board, Coast Bus schedules, information on leases, tenant rights, security deposits, subleasing, and sports activities information. The Memorial Union Information Center can be reached at (603) 862-2600.

Student Organization Services (SOS)

Student Organization Services is located in Room 120, Memorial Union. The office is well educated on the subject of leadership, volunteerism, program planning, program funding, running meetings, and working through the University of New Hampshire System. Staff members are available to assist students. SOS is also in charge of the University recognition process for clubs and organizations. Any student who is interested in getting involved should stop by the office or visit the Web page at www.unh.edu/sos.

Health Services

The University has a state-licensed and nationally accredited health and wellness program. Health Services provides comprehensive primary health care, including laboratory examination, x-rays, and pharmacy services. The staff maintains close relationships with outside specialists in the area to whom they may refer patients. Three well-staffed and -equipped community hospitals are nearby, and emergency ambulance service is available in Durham at all times. For after-hours urgent care, Health Services has an agreement with a nearby hospital to provide care for students.

During the regular academic year, Health Services is staffed by full-time board-certified physicians, as well as part-time consultant physicians in pathology, and radiology. Additional clinical staff include nurse practitioners, nurses, and medical assistants. All full-time registered nurses are certified in college health. Visits with physicians or nurse practitioners are by appointment. Medical problems requiring immediate attention are evaluated and treated on a walk-in basis.

Office of Health Education and Promotion (Health Services)

The Office of Health Education and Promotion presents educational workshops on a variety of physical and emotional health issues. Confidential assessments and referrals are also available. The resource room (Room 249) contains information on physical and emotional health issues, including HIV/AIDS, alcohol/other drugs, men's and women's health issues, wellness, stress management, sexuality, and eating concerns. The office also offers massage therapy appointments. These services and programs reflect Health Services' commitment to promoting awareness and encouraging self-care and informed decision making.

Appointments are made at the Office of Health Education and Promotion, or by calling (603) 862-3823.

Counseling Center

The Counseling Center offers confidential professional consultation, individual and group therapy, and educational workshops for a broad range of emotional, psychological, and interpersonal concerns. Services are provided for all students who have paid their health services and counseling fee and who may be facing a major crisis, confusion, depression, family difficulties, or other personal problems.

The center provides a scheduled intake system. Intake appointments can be made over the phone or in person. In addition, emergency services are offered by the Counseling Center during regular business hours, 8:00 A.M.–5:00 P.M., Monday through Friday, and after hours through Health Services at (603) 862-2844. When necessary, the center's staff assists with outside mental health referrals.

The staff, which includes certified psychologists, counselors, and consulting psychiatrists, is committed to the welfare and development of UNH students. The staff is available for consultation with faculty, administrative staff, and parents on matters relating to the welfare of students.

All information about a student's visits to the Counseling Center is confidential and cannot be released without the written permission of the student. For information or to schedule an appointment, call (603) 862-2090 or visit the center's Web page at www.unhcc.unh.edu/.

Other Services

Career Services

The Office of Career Services assists students at every stage of their career development, from help with career goal clarification to job placement. Career identification testing, career counseling, placement workshops, a career advisers network, internships, part-time jobs, Career Fairs, and an on-campus interviewing program are all available. A library of information on employers and career information is also available to help with the student's career goals. A credential service that sends letters of recommendation and transcripts to prospective employers in education and not-for-profit organizations may be useful. Their Web page has complete information on Career Services' offerings at www.unh.edu/career-services/.

Center for International Education

The Center for International Education fosters the growth of international awareness and programming at UNH and throughout the state by facilitating multidisciplinary education on global issues and international affairs, contributing to the overall international character of the state. The center runs the New Hampshire International Seminar Series, which is open to the public. The center also houses study abroad programs and academic programs in international affairs. Small travel grants are available to graduate students for international travel to conferences or for research. The center also houses annual competitions for the Student Fulbright and National Security Education Program. For information, call the center at (603) 862-2398.

Multicultural Student Affairs

The mission of the Office of Multicultural Student Affairs (OMSA) at UNH is twofold: to provide services to Black, Latino, Asian and Pacific Islanders, Native American, and gay, lesbian, bisexual, and transgendered students in order to increase their retention and graduation rates; to support, promote, and assist student groups that contribute to making the University a diverse, multicultural community.

In pursuit of this vision and mission, the Office of Multicultural Student Affairs is dedicated to fostering the full participation of these student groups in all facets of the UNH community, and assuring that they have equal and fair access to all academic, social, and recreational groups and activities.

In addition, OMSA serves as an umbrella organization that assists in planning efforts to promote diversity and pluralism in all facets of campus life. It acts as an advocate for students and as a University liaison to various student organizations and offices, such as the Diversity Support Coalition, MOSAICO Latino Student Organization, the Black Student Union (BSU), United Asian Coalition (UAC), Native American Cultural Association (NACA), the Alliance (gay, lesbian, bisexual, transgender and questioning student organization), and Hillel (Jewish Student Organization), among others.

Office of International Students and Scholars

The Office of International Students and Scholars (OISS) promotes international education at UNH by facilitating the enrollment and employment of foreign nationals and by providing them with essential support services. The OISS coordinates programs which encourage interaction between the international, campus, and local communities, thereby fostering awareness and appreciation of other cultures. It is the responsibility of the OISS to ensure University compliance with U.S. immigration and employment regulations and to assist international students, exchange scholars, faculty, and staff in the achievement of their academic and professional goals.

The OISS staff provides counseling, information on University policies, administrative support, and referral services. A variety of social and educational programming activities are offered, including orientation for incoming students, faculty and staff, and others designed to enhance student interaction with the broader community and provide opportunities for sharing in family events. For more information on programs and services visit the OISS Web page at www.unh.edu/oiss. To schedule an appointment, call (603) 862-1508 or send e-mail to OISS@unh.edu.

All international students are encouraged to maintain contact with the OISS and are required by law to report changes of address, academic program, or source of educational funds.

President's Commission on the Status of People of Color

The UNH President's Commission on the Status of People of Color proposes, recommends, and evaluates programs, policies, and services aimed at enhancing diversity and supporting people of color within the UNH community. The commission acts to ensure implementation of goals to increase campus diversity through minority student, faculty, and staff recruitment and retention, and through curriculum development. As an advocacy group, the commission indentifies, recommends, and supports creative strategies for promoting and supporting campus diversity; it works to establish effective and collaborative working relationships between departments, offices, committees, commissions, and special programs that play a role in fostering diversity on campus and ensuring that the environment is supportive of the minority populations. The commission is located in Batcheller House on Rosemary Lane. The office is open Monday through Friday, 8:00 A.M. to 4:30 P.M., (603) 862-2338.

President's Commission on the Status of Women

The mission of the UNH President's Commission on the Status of Women is to create equal employment and educational opportunities for all UNH women by promoting an environment free of sexism and discrimination through policy, advocacy, and education. Established in February, 1972 to serve as a sister organization to the New Hampshire State Commission on the Status of Women, its functions include: collecting information on the status of women in the UNH community; recommending policies to the president and other University administrators; providing education and programs to help women develop their skills, increase networking among women, and inform the community of issues relating to the status of women; and reporting annually to the president on its activities and findings. Commission membership consists of a coordinator, chairperson, secretary, and volunteer representatives from University students, faculty, and staff. Candidates for membership are recommended by the commission and appointed by the UNH president. The commission is comprised of several standing and working committees, which are open to non-commission members. Located in Batcheller House, the commission also maintains an e-mail discussion list for those interested in its activities. Call (603) 862-1058, send e-mail to womens.commission@unh.edu, or visit the commission's Web page at www.unh.edu/womens-commission for more information.

President's Task Force on Gay, Lesbian, Bisexual, and Transgender Issues

The UNH President's Task Force on Gay, Lesbian, Bisexual, and Transgender Issues assists the president in monitoring the campus climate for gay, lesbian, bisexual, and transgender faculty, students, and staff. It reviews policies and programs that might affect the University's gay, lesbian, bisexual and transgender community and makes recommendations to the president on improving campus climate.

Established in 1992, the task force meets monthly during the academic year. Its membership includes gay, lesbian, bisexual, transgender, and straight University faculty, staff, and students who are appointed by the president. Students from the gay, lesbian, bisexual, transgender, and ally community who are interested in participating on the task force are encouraged to contact the chair. Call (603) 862-0545 or visit: www.unh.edu/taskforce-glbt.

Services for Students with Disabilities

UNH is committed to providing students with disabilities equal access to all programs and facilities. The University makes all reasonable academic aids and adjustments for students with disabilities, provides them with maximum independence, and a full range of participation in all areas of life at UNH.

All students with disabilities who anticipate the need for services, should identify themselves and provide written documentation to UNH. Documentation should be provided to the Access Office: Support Services for Students with Disabilities, Room 118, Memorial Union Building, (603) 862-2607 (Voice/TTY), as soon as possible after acceptance, to assure accommodation of disability and smooth coordination of available services.

General Information for Students with Disabilities

1. Students seeking accommodations, academic aids and adjustments should contact the Access Office, 862-2607 (Voice/TTY).

2. Arrangements to move classes to accessible locations may be made by contacting the Access Office, 862-2607 (Voice/TTY).

3. Arrangements for those students who qualify for priority registration (to be determined case-by-case, based on disability) may be made by contacting the Access Office, 862-2607 (Voice/TTY).

4. Most major buildings have ramps. Many of the restroom facilities have been adapted for use by persons with disabilities. Many buildings now have elevators. Contact the Access Office, 862-2607 (Voice/TTY), for information on classroom facilities.

5. Handicap Parking Permits for on-campus use may be obtained by contacting Parking Services, 862-2630. Temporary Handicap Parking Permits are available for a limited time with an appropriate letter from a physician.

6. Special arrangements may be made for students who need routine assistance, e.g., injections, examinations, laboratory tests, medication management, from University Health Services at 862-1530.

7. Food Service: University Hospitality Services may be contacted for information about dietary restrictions due to disability, or for special arrangements which are possible during periods of inclement weather at 862-2583.

8. Housing: Early knowledge of students with disabilities who plan to live in campus residence halls will allow for arrangements to be made for appropriate room locations. Contact Housing at 862-2120.

9. Transportation/Handi Van Service: UNH has specially equipped vans with lifts, which transport students on campus, and to locations along the Wildcat Transit routes. Contact Parking Services for more information at 862-2630.

10. Compliance: Concerns regarding the institution's compliance with the Americans with Disabilities Act, ADA, or Section 504 of the Rehabilitation Act of 1973, and specific complaints should be addressed to ADA Section 504 Compliance Officer, Affirmative Action Office, 862-2930 (Voice/TTY).

No otherwise qualified person may be excluded from or denied any program, course of study or any other offering of the University, solely on the basis of disability.

The Sexual Harassment and Rape Prevention Program (SHARPP)

This program offers free and confidential intervention and prevention services around the issue of sexual violence. Three staff members and fifty volunteer victim advocates provide crisis intervention services to students, faculty, and staff on a twenty-four-hour basis. Advocates provide survivors with support and options surrounding legal, medical, administrative, and therapeutic issues. Support groups and one-to-one support are available for male and female survivors, as well as their significant others. In addition, advocates provide peer education to the UNH community. Educational programs are conducted for fraternities, sororities, athletic teams, residence halls, student organizations, and academic classes. The office, located in Huddleston Hall, is open Monday–Friday, 8 A.M.–4:30 P.M. For more information or other assistance, call (603) 862-3494, 24 hours a day.

Parking and Transportation

All vehicles at the University may park only in specifically designated areas or spaces and must display a valid parking permit appropriately affixed or displayed in the vehicle as directed, or by proper display of a temporary parking permit issued by the UNH Parking Services Office.

The University of New Hampshire provides visitor parking at the Visitor Information Center, 295 Mast Road. Parking is provided in the area of the parking lot that contains many parking meters. Visitors have an option of paying the parking meters or obtaining a Visitor Permit. To obtain a permit, note your vehicle's license plate number and go to the Visitor Center. The service window is open until 4:00 P.M. Parking meters around campus are available for visitors to purchase time.

Annual permits or renewals are issued for the current academic or fiscal year, depending on category, to eligible applicants. Application forms may be obtained from Parking Services at the UNH Parking and Transit Building, 295 Mast Road, Durham. Some permits are obtained by applying on-line via the Parking Web page at www.unh.edu/parking.

Wildcat Transit
Wildcat Transit Bus Service provides public transportation from Durham to Dover, Portsmouth, and Newmarket, with connections to other local and interstate bus service providers. Para-transit service is available within the Wildcat Transit service area. Schedule and service information is available upon request (603-862-2328) and on-line at their Web page, at www.unh.edu/parking/wtransit.html.

University Police

The University Police Department, which is committed to the enforcement of laws and University policies supportive of the rights and dignity of all persons, seeks to maintain a campus environment in which learning may thrive. Officers, professionally trained in their respective areas, staff both the department and its Security Services unit.

Programs, including a women's self-defense program, and literature regarding crime prevention are offered. On request, staff members will meet with groups to share precautions for increasing personal safety and protection of personal property. A walking patrol provides an escort service for students, faculty, and staff. Engraving pencils to inscribe identification numbers on property in case of theft are loaned free of charge to members of the campus community. To take advantage of any of these services, contact the University Police Department at (603) 862-1427.

Veterans Information

The UNH veterans coordinator, located in the Registrar's Office (603) 862-1595, provides counseling on all aspects of veterans benefits as well as assistance in procuring and completing the required forms and certifications for veterans benefits. The veterans coordinator maintains a comprehensive directory to assist veterans in contacting state, local, and University resources for housing, daycare, career planning, employment, financial aid, tutorial assistance, remedial training, handicapped services, and Vietnam Veterans Outreach. The coordinator also provides a framework for networking among campus veterans.

The following pages describe the graduate programs offered at the University. Program descriptions include faculty, degrees offered, special admission requirements, degree requirements, and courses offered.

Explanation of Arrangement

Courses that have been offered during the past three years are listed in this catalog. These are listed by number, title, and credits only.

For up-to-date information about when a course is offered; who teaches the course; the number of recitations, lectures, labs, and such, students are referred to each semester's *Time and Room Schedule,* which carries a complete schedule of courses for the semester. It is also on the Web at: unhinfo.unh.edu/registrar/timeroom/timeandroom.html.

Permission of instructor may be required for enrollment in a particular course. Courses are offered subject to adequate student demand. Consult departments for detailed descriptions of current course offerings.

A complete list of courses including course descriptions is available at
www.gradschool.unh.edu

Accounting and Finance (ACFI)

Professors: Ahmad Etebari, John Freear, Fred R. Kaen
Associate Professor: Catherine A. Craycraft
Assistant Professors: Stephen J. Ciccone, Bruce N. Dehning, Afshad J. Irani, Toni Q. Smith

Degree Offered

The Whittemore School of Business and Economics offers a Master of Science in Accounting degree program. This program has been created in response to a call for a basic change in accounting education issued by the American Institute of Certified Public Accountants (AICPS), the national association of professional accountants (CPA) designation will need a minimum of 150 hours of education.

In addition to AICPA's call, the American Association of Governmental Accountants and the Institute of Management Accountants have also established 150 hours of collegiate study as a desirable prerequisite for entry into their disciplines. To date, more than 44 state legislatures have formally addressed the issue of post-baccalaureate accounting education as a prerequisite for the CPA exam and as a requirement for state certification and licensing. Regulation or legislation has been introduced in all other states and territories.

The Master of Science in Accounting degree program is designed to address the concerns of the accounting profession within the parameters of the Whittemore School's educational philosophy. This program emphasizes analytical communication skills, while preserving the basic core of technical accounting knowledge. It mandates 30 hours of post-graduate study. Students awarded a Master of Science of Accounting degree will be competitively equipped to enter the job market in the accounting profession.

Admission Requirements

The primary admission period for the program is the fall. The crucial requirment for admission is a personal history that demonstrates high academic achievement, as well as the applicant's potential and desire for graduate study in accounting. Applicants are required to submit copies of prior academic records, current GMAT scores, three references, and a complete Graduate School application. A baccalaureate degree program must be completed prior to beginning the program. Since the Whittemore School is accredited by the American Assembly of Collegiate Schools of Business, candidates meet the requirements set down by this organization.

The deadline for regular admission is July 1st and for early decision, April 1st. Admission to the program is highly selective and limited, so it is in the applicant's best interest *to apply early*. Interested applicants are encouraged to contact George T. Abraham, Director of Graduate and Executive Programs, Whittemore School, 15 College Road, Durham, NH 03824-3593, 603-862-1367. E-mail: wsbe.grad.program@unh.edu; Web address: www.unh.edu.acfi.

Degree Requirements

Upon admission to the program, applicants are required to complete ten courses detailed in the following program outline. All admitted candidates are expected to have completed a series of prerequisite courses. If an applicant has not completed all the prerequisite courses, the admissions committee may offer provisional admission and require that the applicant take the prerequisite courses prior to moving into full degree candidacy.

Fall Semester
Accounting Theory and Research
Topics in Advanced Accounting
Contemporary Issues in Financial Reporting
Elective*
Elective*

Spring Semester
Governmental and Nonprofit Accounting
Seminar in Ethics and Accounting
Accounting Information Systems
Master's Project
Elective*

*Candidates will be advised to select appropriate graduate level electives offered by the Whittemore School.

Courses

844	Topics in Advanced Accounting	3 cr.
849	Contemporary Issues in Financial Reporting	3 cr.
850	Accounting Theory and Research	3 cr.
890	Accounting Information Systems	3 cr.
895	Governmental and Non-Profit Accounting	3 cr.
897	Seminar in Ethics and Accounting	3 cr.
898	Master's Project	3 cr.

Profile

Jill Raymond

M.S. student, Communication Sciences and Disorders

Photos: Lisa Nugent

"With this client, we're working on social skills, playing with other children, and initiating conversation," says Jill Raymond. "He also signs and uses a minicomputer that says the word he wants to say when he presses a button. It supplements his verbal communication. And, he has a lot to say."

This is Raymond's second rotation at UNH's Speech-Language-Hearing Center. "I meet regularly with the center's coordinator, Assistant Professor Amy Plante," says Raymond. "She observes most of my sessions and gives me a lot of feedback. But she also gives me plenty of independence."

When Raymond completes her master's in communication sciences and disorders, she will have a minimum of 350 hours of supervised clinical experience. Next fall, her rotation will be at an elementary school and in the spring either at a hospital or rehab center.

"I'm leaning toward adult rehab," Raymond says. "I'm intrigued by stroke rehabilitation—to help people who once had the ability to communicate."

Adult and Occupational Education (AOE)

Degree Offered

The Department of Education offers the master of adult and occupational education degree. Graduate students can select one of two areas of concentration: (1) vocational/technical education; or (2) adult education.

Admission Requirements

Applicants should consult with a faculty member before seeking admission, because an applicant's scholastic achievement, experience, references, and professional goals are all relevant in the admission process. Applicants must also submit scores achieved on either the Graduate Record Examination general test or the Miller Analogies Test, in addition to the materials required by the Graduate School.

Master of Occupational Education Degree Requirements

All students are required to take AOE 912, Introduction to Social Sciences Research; AOE 998, Adult and Occupational Education Seminar (1–2 cr.); and AOE 802, Concepts of Adult and Occupational Education. Students concentrating in the area of vocational/technical education must also complete AOE 901, Advanced Methods and Materials of Instruction. Students concentrating in adult education are required to take AOE 990, Programming in Adult Education.

A graduate guidance committee consisting of a minimum of two faculty members from occupational education plus one other graduate faculty member is appointed for each student. Prior to the completion of 12 credit hours, the individual's graduate program is approved by the student's graduate committee. A minimum of 18 credit hours within the program is required. The committee, working with the candidate, makes every effort to provide a total program that reflects the goals of the individual.

Students must select a thesis or nonthesis option. Students completing a thesis are required to defend it orally. Students following the nonthesis option are required to complete written and oral examinations plus a professional paper.

Students may obtain initial certification in vocational agriculture and trade and industrial education through this program.

Courses

800	Workshop in Adult and Occupational Education	1 to 4 cr.
802	Concepts of Adult and Occupational Education	4 cr.
852	Youth Organizations	4 cr.
891	Planning for Teaching	4 cr.
896	Investigations in Adult and Occupational Education	1 to 4 cr.
899	Master's Thesis	6 to 10 cr.
900	College Teaching	2 cr.
911	Internship	8 cr.
912	Introduction to Social Sciences Research	4 cr.
920	The Community-Junior and Vocational/Technical Colleges	4 cr.
990	Programming in Adult Education	4 cr.
995	Independent Study	2 to 6 cr.
998	Adult and Occupational Education Seminar	1 to 2 cr.

Animal and Nutritional Sciences (ANSC)

Professors: William E. Berndtson, William A. Condon, Thomas P. Fairchild, Thomas L. Foxall, Charles G. Schwab, Samuel C. Smith, Anthony R. Tagliaferro, Robert L. Taylor, Jr.
Adjunct Professors: Ronald E. Rompalla, Martin Stokes, Mark R. Windt, M.D.
Associate Professors: Patricia D. Bedker, Dennis J. Bobilya, Elizabeth P. Boulton, Gale B. Carey, Joanne Curran-Celentano, Colette H. Janson-Sand, Paul C. Tsang
Adjunct Associate Professor: Arthur F. Stucchi
Assistant Professors: Peter S. Erickson, David H. Townson
Adjunct Assistant Professors: Paul F. Cotter, Eugene J. Rogers, Glenn T. Shwaery

Degrees Offered

The Department of Animal and Nutritional Sciences offers the master of science in animal science and nutritional science and doctor of philosophy degrees. Doctoral and master's students may specialize in animal nutrition, human nutrition, reproductive physiology, mammalian physiology, cell biology, and immunology. Master's students may also specialize in genetics or dairy management.

Admission Requirements

An applicant is expected to have had sufficient undergraduate training in the basic biological sciences to qualify for special work in this field. All applicants must submit general test scores from the Graduate Record Examination.

Admission to the M.S. in Nutritional Sciences program is contingent upon admission to the Graduate School. Undergraduate preparation should include a Bachelor of Science degree and at least one semester each of organic chemistry and biochemistry and two semesters of human nutrition. In addition, Graduate Record Examination (GRE) scores in verbal, quantitative and analytical tests are required.

M.S. in Animal Sciences

Degree Requirements

A student will meet the Graduate School's requirements for the master's degree and must defend a thesis based on a research problem. The program requires a minimum of 30 credit hours and may include no more than 6 credits of thesis research and no more than 4 credits of investigations. Each candidate must present at least two seminars (exclusive of the thesis defense) and must serve as a teaching assistant for one semester.

M.S. in Nutritional Sciences (Thesis Option)

This program is designed for a career in research and college teaching. Goals of the program are to develop critical thinking, research, and writing skills in science, to deepen the understanding of nutrition as a science, to gain competency in designing and testing an experimental hypothesis, and to communicate research findings in a thesis of publishable quality.

Degree Requirements

The program of study must include a minimum of 30 graduate credits and completion of a thesis based on a research project. A thesis committee will be appointed during the first semester of enrollment and will consist of at least three members of the graduate faculty. This committee, in conjunction with the candidate, will design the program of study. Candidates for the M.S. degree will be required to pass an oral examination based on graduate courses and completed thesis.

Required Courses

NUTR 850	Nutritional Biochemistry	4 cr.
NUTR 880	Critical Issues in Nutrition	4 cr.
NUTR 873	Clinical Nutrition	4 cr.
NUTR 910	Mineral Nutrition	2 cr.
NUTR 912	Vitamin Nutrition	2 cr.
ANSC 901	Introduction to Research	2 cr.
ANSC 997	Animal and Nutritional Science Seminar	2 cr.
ANSC 998	Animal and Nutritional Science Seminar	2 cr.
NUTR 899	Master's Thesis	6 cr.
Electives		4 cr.

M.S. in Nutritional Sciences (Non-thesis Option)

This program provides advanced education in the scientific basis of nutrition and the role of nutrition in health promotion and disease prevention. Expertise is gained through coursework and scholarship designed to develop critial inquiry skills for a variety of professional pursuits. Goals of the program are to provide a convenient format in which working professionals can gain an advanced degree in nutrition, to provide current information in the basic and applied aspects of nutrition, and to provide tools and training for conducting independent nutrition research.

Degree Requirements

Students in this program will complete a minimum of 30 credits and completion of a master's project. Each candidate will develop a project of interest and identify a mentor within the department as an advisor throughout the project. Students will be required to submit a final written report and give an oral presentation of the project to faculty and students of the graduate program in nutrition.

Required Courses

NUTR 850	Nutritional Biochemistry	4 cr.
NUTR 880	Critical Issues in Nutrition	4 cr.
NUTR 873	Clinical Nutrition	4 cr.
NUTR 910	Mineral Nutrition	2 cr.
NUTR 912	Vitamin Nutrition	2 cr.
ANSC 901	Introduction to Research	2 cr.
ANSC 997	Animal and Nutritional Sciences Seminar	2 cr.
ANSC 998	Animal and Nutritional Sciences Seminar	2 cr.
NUTR 998	Master's Project	4 cr.
Electives		6 cr.

Ph.D. Degree Requirements

Students with appropriate academic training at the baccalaureate or master's level will design a program of study in conjunction with a faculty guidance committee. Upon completion of graduate courses and demonstration of computer literacy, a doctoral student will be required to pass an oral qualifying examination conducted by the guidance committee. This examination may include a written component at the discretion of the committee. After the student's advancement to candidacy for the Ph.D. degree, a doctoral committee will be appointed to supervise and approve the dissertation and to administer the final examination, which will be primarily an oral defense of the dissertation. During the tenure of the Ph.D. program, the candidate will be required to serve as a teaching assistant for two semesters or to teach a course for one semester.

ANSC Courses

801	Physiology of Reproduction	4 cr.
802	Endocrinology	4 cr.
806	Human Genetics	3 cr.
808	Ruminology	2 cr.
810	Dairy Nutrition	2 cr.
814	Research Methods in Endocrinology	5 cr.
815	Physiology of Lactation	4 cr.
824	Reproductive Management and Artifical Insemination	4 cr.
827	Advanced Dairy Management I	4 cr.
828	Advanced Dairy Management II	4 cr.
850	Nutritional Biochemistry	4 cr.
851	Cell Culture	5 cr.
896	Investigations in the Animal Sciences	1 to 4 cr.
898	Contemporary Topics in Biomedical Science and Nutrition	2 cr.
899	Master's Thesis	6 cr.
900	Topics in Animal and Nutritional Sciences	1 cr.
901	Introduction to Research	2 cr.
904	Amino Acid Metabolism	2 cr.
905A	Intermediary Metabolism & Exercise	2 cr.
905B	Intermediary Metabolism & Exercise	2 cr.
906	Methods in Protein Nutrition and Metabolism	2 cr.
909	Contemporary Trends in Reproductive Physiology	4 cr.
913	Contemporary Topics in Immunobiology	2 cr.
995	Research in Animal Science	1 to 4 cr.
996	Research in Animal Science	1 to 4 cr.
997	Animal Science Seminar	1 cr.
998	Animal Science Seminar	1 cr.
999	Doctoral Research	

NUTR Courses

820	Community Nutrition (was ANSC 820)	4 cr.
840	Nutrition for Children with Special Needs	2 cr.
850	Nutritional Biochemistry	4 cr.
860	Geriatric Nutrition (was ANSC 860)	2 cr.
873	Clinical Nutrition (was ANSC 873)	4 cr.
875	Practical Applications Medical Nutrition Therapy (was ANSC 875)	3 cr.
880	Critical Issues in Nutrition (was ANSC 880)	4 cr.
899	Master's Thesis	6 cr.
910	Mineral Nutrition (was ANSC 910)	2 cr.
911	Lipids (was ANSC 911)	4 cr.
912	Vitamin Nutrition (was ANSC 912)	2 cr.
930	Dietetics Practicum I	4 cr.
931	Dietetics Practicum II	2 cr.
955	Disorders in Energy Balance (was ANSC 855)	4 cr.
996	Contemporary Topics in Biomedical Science and Nutrition	2 cr.
998	Master's Project	2 to 4 cr.

For more information about graduate studies at UNH visit our Web site at

www.gradschool.unh.edu

Biochemistry and Molecular Biology (BCHM)

Professors: Clyde L. Denis, Thomas M. Laue, Samuel C. Smith, Stacia A. Sower, William R. Trumble
Research Professor: Vernon N. Reinhold
Associate Professors: John J. Collins, Rick H. Cote, Anita S. Klein, Andrew P. Laudano
Research Associate Professor: William A. Gilbert
Assistant Professors: Lisa B. Clark, G. Eric Schaller

Degrees Offered

The Department of Biochemistry and Molecular Biology offers the master of science and the doctor of philosophy degrees in biochemistry. The department offers research opportunities in developmental genetics, eukaryotic gene regulation, metabolism, molecular evolution, molecular genetics, plant biochemistry, physical biochemistry, oncogene function, signal transduction, structure and function of macromolecules, transposable elements, molecular endocrinology, biochemical endocrinolgy and neuroendocrinology, and molecular population genetics. Opportunities also exist for interdisciplinary research in marine biochemistry, biochemical nutrition, and cell biology in adjunct facilities on campus.

Admission Requirements

An applicant is expected to have completed basic courses in chemistry, biological sciences, mathematics, and physics. Otherwise well-qualified applicants will be permitted to correct deficiencies in undergraduate education by enrollment in the appropriate courses or by independent study during the first year. All applicants must submit general test scores from the Graduate Record Examination.

M.S. Degree Requirements

A student will meet the Graduate School's requirements for the master's degree (minimum 30 credits) and will be expected to develop a thesis on a basic research problem or to prepare a report or publication based on original research in biochemistry or molecular biology. Demonstration of proficiency in organic chemistry, physical chemistry, and biochemistry will be assessed in the first year. All candidates for the M.S. degree will be required to pass an oral examination based on the thesis or project report and on the graduate courses completed in the degree program.

B.S./M.S. Degree Requirements
This accelerated five-year program leading to a combined bachelor and master's degree in biochemistry is designed for highly motivated and qualified undergraduate UNH students seeking additional training to further their career goals as researchers in the life sciences.

Admission to the combined degree program is highly competitive. Students wishing to pursue this program must have a grade point average greater than 3.2 at the time of application. A thesis adviser must be identified during the junior year, and the approval of the adviser must be obtained. Prior to the first semester of the senior year, the student must formally apply to the department through the Graduate School and receive early admission. The requirement for the Graduate Record Examinations is waived for combined degree applicants.

Thirty credits of graduate level (800-999) course work (including dual credit courses) must be completed. Six to eight credits of graduate level courses must be taken during the senior year and are applied to both the B.S. and M.S. requirements. All other requirements for the M.S. degree must be followed.

Ph.D. Degree Requirements

Doctoral students will be required to complete a dissertation on original research in biochemistry or molecular biology. Demonstration of proficiency in organic chemistry, physical chemistry, and biochemistry will be assessed in the first year. In the second year, students will be required to write and defend a research proposal in an area unrelated to their thesis project. Upon completion of graduate courses recommended by a guidance committee, a doctoral student will be required to pass an oral qualifying examination conducted by the guidance committee. The successful completion of these requirements and advancement to candidacy for the Ph.D. degree must occur at least six months prior to the final oral defense of the Ph.D. dissertation administered by the student's doctoral committee.

Teaching Requirement

Teaching assignments—in the laboratory, in lectures, or in an individual instruction format—are an essential part of the graduate academic programs of the department and are designed to give graduate students practical teaching experience. Normally, one year of part-time teaching will be required of each student.

CAMIS

The department has access to the Center of Advanced Molecular Interaction Sciences (CAMIS). This center develops instruments and methods for characterizing the strengths and stoichiometry of molecular interactions. Unique and cutting-edge instrumentation and trained personnel are available to help graduate students characterize protein-protein, protein-nucleic acid, and protein-lipid binding.

Courses

802	Endocrinology	4 cr.
811	Genetics of Eukaryotic Microbes	4 cr.
850	Physical Biochemistry	3 cr.
851	Principles of Biochemistry	4 cr.
852	Principles of Biochemistry	4 cr.
854	Laboratory in Biochemistry and Molecular Biology of Nucleic Acids	5 cr.
855	Laboratory in Biochemistry and Molecular Biology	5 cr.
863	Biochemistry of Cancer	3 cr.
864	Membrane Biochemistry	3 cr.
871	Molecular Genetics	4 cr.
882	Developmental Genetics	3 cr.
894	Protein Structure and Function	3 cr.
895	Investigations in Biochemistry and Molecular Biology	1 to 4 cr.
899	Master's Thesis	6 to 10 cr.
902	Endocrine Disruptors/Neuroendocrinology	3 cr.
942	Biochemical Regulatory Mechanisms	3 cr.
950	Macromolecular Interactions	3 cr.
960	Advanced Topics in Signal Transduction	3 cr.
991	Advanced Topics in Molecular Genetics	3 cr.
992	Advanced Topics in Molecular Biology	3 cr.
993	Advanced Topics in Enzyme Regulatory Mechanisms	3 cr.
997	Biochemistry Seminar	1 cr.
998	Biochemistry Seminar	1 cr.
999	Doctoral Research	

Business Administration (ADMN)

Professors: Steven F. Bolander, Ahmad Etebari, John Freear, Raymond J. Goodman, Jr., Charles W. Gross, Jonathan Gutman, Francine S. Hall, Fred R. Kaen, Allen M. Kaufman, Michael J. Merenda, Barry Shore, Jeffrey E. Sohl, Linda G. Sprague
Associate Professors: Carole K. Barnett, Catherine A. Craycraft, Joseph F. Durocher, Jr., Ross J. Gittell, Roger B. Grinde, Richard L. Mills, William Naumes, R. Daniel Reid, Christine M. Shea, Allen R. Thompson, A. R. Venkatachalam, Rita Weathersby, Craig H. Wood
Assistant Professors: Bruce N. Dehning, Afshad J. Irani, Toni Smith

Degree Offered

The Whittemore School of Business and Economics offers a program leading to the M.B.A. in formats designed for full-time students, part-time students in an evening program, and practicing managers in a weekend executive program. The M.B.A. program is directed toward a broad preparation in general administration. An **option in Health Management** is available within the part-time program. The Whittemore School is currently undertaking a major review of the M.B.A. program. Consult with the Graduate Program office for an up-to-date list of program requirements or visit the Web site: www.mba.unh.edu.

The mission of the Whittemore School is to be a nationally distinguished professional school focused on high quality education and placement of all students in career related jobs. The school aims to be a leader in servicing the business and professional community in the state and region through emphasis on three integrative areas: Management of Technology and Innovation, International Business, and Entrepreneurship.

The objective of the **Management of Technology and Innovation** concentration is to prepare students for management careers in technology-and knowledge-based companies. This concentration is about managing changes in how things are done or made. It includes the management of resources (such as people and equipment) used in the production of goods and services and the changes made to those resources aimed at improving the efficiency of the process or the excellence of the output. Students choosing this concentration study topics which include how to measure the economic impact of technology for a process or product, and maximize individual creativity in an organizational setting.

International Business is designed to prepare future managers for positions in organizations and firms, regardless of size, that serve international markets, face international competition, or participate in international alliances and collaboration. Language study, and/or international study and travel experience are an integral part of this concentration.

The **Entrepreneurship** concentration is designed to prepare students to develop the skills to plan and direct their own businesses. It seeks to develop entrepreneurial managers who understand how to create profit-centered, autonomous business

units, either stand-alone or within larger business organizations. The concentration prepares students to find and test new business concepts, write and present an effective business plan, structure and locate financing for a new venture, and master cash flow management techniques.

Admission Requirements

The Whittemore School welcomes applicants with an above-average academic record in any undergraduate specialty. The crucial requirement for admission into the M.B.A. program is a history that demonstrates that the applicant has the potential and desire for graduate study in business. The focus of the student's earlier education is of less importance than evidence of academic ability and potential for becoming a responsible manager and leader. Consequently a "portfolio" approach to admissions is adopted, in which an applicant's work and military experience along with other indications of maturity, motivation, and self-discipline are considered as well as the applicant's test scores and academic record. All applicants are required to take the Graduate Management Admission Test (GMAT). Applicants are expected to have successfully completed one semester of calculus or have demonstrated proficiency in quantitative reasoning. Interested applicants are encouraged to contact George T. Abraham, Director of Graduate and Executive Programs, Whittemore School, 15 College Road, Durham, NH 03824-3593.

Full-Time M.B.A. Degree Requirements

The Whittemore School curriculum for full-time students consists of an integrated sequence of courses normally requiring two years of full-time study. During the first year, required courses in the basic disciplines and the functional areas of management are integrated into an overall study of the process of administration. In the second year, a student may continue the emphasis on general management or pursue an integrated concentration within the T.I.E. framework. In addition to electives offered by the departments in the Whittemore School, students are encouraged to undertake internships and may take a maximum of three appropriate graduate-level courses offered by other departments within the University.

Part-Time M.B.A. Degree Requirements

A sequence of required and elective courses may be started in September, January, or April, However, the principal admission period is in September. Courses are offered with a fall, winter, and spring term each year. By taking two classes per term, students will complete the program in three and a third years.

The required courses are divided into skill, functional, and policy courses with the skill courses early in the program. The policy courses complete the Whittemore M.B.A. experience and are taken only after the skill and functional classes are completed. The elective courses are based on prerequisites. In the third year, a student may continue the emphasis on general management or pursue an integrated concentration within the T.I.E. framework. In addition to electives offered in the M.B.A. program, students may take a maximum of three electives outside the department, provided they have approval from the M.B.A. program office.

The curriculum is designed to build a base for understanding and analytical competence. Most classes meet four hours once a week in the evening.

Full- and Part-Time M.B.A. Curriculum

13 required courses

- Financial Accounting
- Management Information Systems
- Economics
- Organizational Behavior
- Managerial Accounting
- Financial Management
- Operations Management
- Quantitative Methods
- Marketing
- Advanced Organizational Theory
- Business Government, and Society
- Strategic Management: Decision Making

plus 7 electives

Although the curriculum is the same for both models, delivery is different. Full-time students take five courses a semester for two years; part-time evening students take two courses in a trimester schedule for a minimum of three years.

Executive M.B.A. Degree Requirements

The curriculum for practicing managers comprise eighteen courses which include thirteen core courses as well as a required Integrative Management Seminar that runs throughout the first year. The curriculum is tailored and scheduled to meet the needs of those individuals working full time at managerial-level jobs. The program emphasizes general management and provides for broad-based exposure to the functional areas of finance and accounting, human resource management, marketing, and operations and strategic management. The program is offered in Durham at the New England Center. The nineteen-month program begins in the fall with a full residency week of classes. Thereafter, classes are held twice each month in all-day Friday and Saturday sessions.

Executive M.B.A. Curriculum

First Year

Term I
- Financial Accounting
- Mangerial Statistics
- Organizational Behavior
- Integrative Management Seminar

Term II
- Quantitative Methods
- Management Information Systems
- Marketing
- Integrative Management Seminar

Term III
- Managerial Accounting
- Economics
- Operations Management
- Integrative Management Seminar

Summer Research Project

All students will undertake an independent summer research project in the topic of their choice with oversight from a faculty sponsor.

Second Year

Term I
- Financial Management
- Organizational Theory
- International Business Track
- Choice of either Management of Technology and Innovation track or Entrepreneurship track

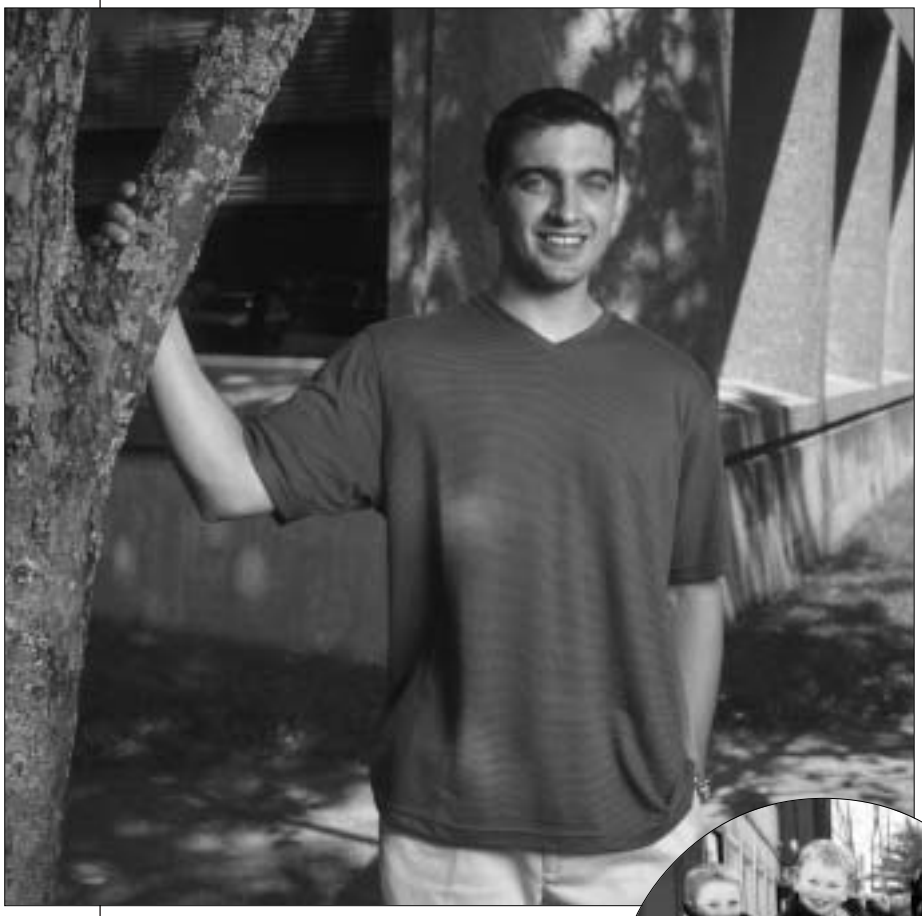
Term II
- Business, Government, and Society
- Strategic Management: Decision Making
- International Residence
- Continuation of track chosen in Term 1

International Residence During the second year of study, the curriculum will

Profile

Jon Matheke

M.S., Accounting, May '01



Doug Prince

When Jon Matheke begins his career with Arthur Andersen in its Manchester office, it will be the result of a diligent, thoughtful academic journey.

"As an undergraduate business administration major at UNH, I really liked the finance classes," recalls Matheke.

Building on that, while earning his master's degree, he looked for internships to supplement his learning.

"My first internship was in internal audit, and that gave me the experience to locate the numbers," says Matheke. "Then I interned with Philip Morris and Hannaford Bros. to evaluate their inventory system from a management perspective. But my favorite internship was with Gibraltar Securities in New Jersey. I was a junior financial analyst and worked full time under a great boss who taught me the ins and outs of credit unions."

These internships, combined with a strong academic foundation, positioned Matheke well for a job.

He also had strong extracurricular and volunteer interests, which included software testing, teaching skiing, and marketing work for a small ski area.

"The curriculum and the electives allow you to develop your skills in specific areas. I really enjoyed the finance courses."

address the issues of global competition via case studies, guest presenters, and a required ten-day international residence. While guest presenters and case studies will be scattered throught the year, the international residence will take place in Term II.

All graduate-level courses reqire permission of the instructor and graduate program office.

Courses

807	Multivariate Analysis	3 cr.
812	Managing Organizational Change	3 cr.
815	Consulting Practicum	3 cr.
821	Auditing	3 cr.
822	Advanced Cost Accounting	3 cr.
823	Topics in Finance	3 cr.
824	Resource Management	3 cr.
826	Decision-Support Systems	3 cr.
829	Financial Policy	3 cr.
830	Investments Analysis	3 cr.
831	Derivative Securities and Markets	3 cr.
832	Exploration in Entrepreneurial Management	3 cr.
836	Financial Statement Analysis	3 cr.
837	Financial Accounting Theory and Applications I	3 cr.
840	International Business	3 cr.
841	International Management	3 cr.
844	Simulation for Business Decision Making	3 cr.
846	International Financial Management	3 cr.
847	Business Taxation	3 cr.
848	Law: Use and Application in Business	3 cr.
851	Advertising and Promotion	3 cr.
852	Marketing Research	3 cr.
855	Marketing of Services	3 cr.
859	Managing Technological Innovations	3 cr.
861	Sales Management	3 cr.
863	International Marketing	3 cr.
865	Total Quality Management	3 cr.
867	Art and Science of Decision Making	3 cr.
898	Topics in Administration	3 cr.
900	Integrative Management Seminar	
912	Organizational Behavior	3 cr.
920	Financial Accounting	3 cr.
921	Managerial Accounting	3 cr.
925	Advanced Organizational Theory	3 cr.
926	Management Information Systems	3 cr.
930	Financial Management	3 cr.
940	Operations Management	3 cr.
950	Managerial Statistics	3 cr.
955	Quantitative Methods	3 cr.
960	Marketing	3 cr.
970	Economics	3 cr.
981	Business, Government, and Society	3 cr.
982	Strategic Management: Decision Making	3 cr.
992	Special Projects and Independent Study	1 to 6 cr.

Chemical Engineering (CHE)

Professors: Dale P. Barkey, Stephen S.T. Fan, Ihab H. Farag, Virendra K. Mathur, Palligarnai T. Vasudevan
Associate Professors: Russell T. Carr, Donald C. Sundberg

Degrees Offered

The Department of Chemical Engineering offers the master of science degree and chemical engineering Ph.D. option in the Engineering Ph.D. Program.

Admission Requirements

An applicant is expected to have completed a baccalaureate degree or master's degree in chemical engineering. Students with good academic records but with deficiencies in certain areas may be admitted on condition that they complete specified courses without credit to make up for their deficiencies.

M.S. Degree Requirements

A minimum of 30 credits—which must include CHE 913, 915, 916, 923, and 932—is required for the master of science in chemical engineering. The core courses requirement can be waived only in special cases with permission from the department faculty. A thesis (6 credits) is required, unless the candidate is specifically exempted by the faculty because of previous research experience. These candidates must still fulfill the 30 credit minimum requirement.

Ph.D. Option Requirements

Students admitted to the Ph.D. program normally hold master's degrees in chemical engineering. The program generally requires three years of study beyond the master's degree.

A minimum of 50 credits or 15 courses (whichever comes first) must be completed beyond the bachelor's degree. At least eight of the courses must be at the 900 level. Students who enter the Ph.D. program must pass a written qualifying examination which consists of five papers on the following topics:

Heat Transfer
Mass Transfer
Fluid Mechanics
Thermodynamics
Kinetics

The qualifying examination is administered after the completion of coursework requirements. The student must prepare a research proposal which is different from his/her Ph.D. dissertation research and defend the proposal in an oral examination before a committee.

There is no language requirement.

A dissertation based on original research is required. Upon completion of the dissertation, doctoral candidates will take the final oral examination.

Permission of the instructor and consent of the student's adviser are required for enrollment in all chemical engineering courses.

Courses

801	Introduction to Polymer Engineering	4 cr.
805	Natural and Synthetic Fossil Fuels	4 cr.
809	Fundamentals of Air Pollution and Its Control	4 cr.
812	Introduction to Nuclear Engineering	4 cr.
851	Process Simulation and Optimization	4 cr.
852	Process Dynamics and Control	4 cr.
861	Biochemical Engineering	4 cr.
872	Physicochemical Processes for Water and Air Quality Control	4 cr.
899	Master's Thesis	6 cr.
913	Advanced Fluid Mechanics	3 cr.
915	Heat Transfer	3 cr.
916	Diffusive Mass Transfer	3 cr.
923	Advanced Chemical Engineering Thermodynamics	3 cr.
932	Advanced Chemical Engineering Kinetics	3 cr.
996	Graduate Independent Study	2 to 4 cr.
999	Doctoral Research	

Chemistry (CHEM)

Professors: Christopher F. Bauer, N. Dennis Chasteen, Arthur Greenberg, Richard P. Johnson, Howard R. Mayne, W. Rudolf Seitz, Sterling A. Tomellini, Gary R. Weisman, Edward H. Wong
Research Professor: Vernon N. Reinhold
Associate Professors: Glen P. Miller, Roy Paul Planalp, Charles K. Zercher
Assistant Professor: Joseph D. Geiser
Research Assistant Professor: Bruce B. Reinhold

Degrees Offered

The Department of Chemistry offers programs leading to the doctor of philosophy and the master of science degrees in the areas of organic, inorganic, physical, and analytical chemistry. The department also offers the master of science for teachers.

Admission Requirements

Admission to the master of science and the doctor of philosophy degrees is based upon a strong undergraduate record and requires satisfactory work in the usual undergraduate courses in inorganic chemistry, analytical chemistry, organic chemistry, and physical chemistry, as well as the normal supporting courses in mathematics and physics.

Entering graduate students (except for those desiring the M.S.T. degree) are expected to take proficiency examinations in chemistry to assist in starting each new student's graduate work at the proper level. These examinations will be offered at the beginning of each semester on dates announced in the departmental graduate calendar.

Applicants for the master of science for teachers should consult the General Regulations of the Graduate School for special admission requirements.

M.S. Degree Requirements

The master's degree requires completion of coursework appropriate to the student's field of study and the completion of a research problem presented in the form of a thesis. A minimum of 30 credit hours is required.

Master of Science for Teachers Degree Requirements

This degree requires 30 credit hours in graduate-level courses approved by the graduate coordinator. Persons interested in this degree should confer with the department's graduate program coordinator.

Ph.D. Degree Requirements

The doctoral degree requires completion of coursework appropriate to the student's field of study and the completion of a research problem presented in the form of a dissertation. The analytical, inorganic, organic, and physical divisions require expertise in the use of computers. Students will also demonstrate to the guidance committee that they have a broad basic knowledge of the field of chemistry: (1) by completing certain fundamental graduate courses; (2) by means of a series of examinations in the major field; and (3) by presenting and defending an original research proposal before the end of the third year (CHEM 907). The culmination of the program will result in a public defense and acceptance of the dissertation.

Interdisciplinary Programs in Chemistry

Graduate students in chemistry may elect to enter one of the interdisciplinary programs offered jointly with the chemistry department and other departments. In these programs, the graduate student, with the advice of the guidance committee, elects courses in chemistry and in the related disciplines, and writes the dissertation on a research problem appropriate to interdisciplinary treatment. Students interested in these programs should write to the graduate coordinator for further information.

Teaching Requirement

All graduate students who are doctor of philosophy or master of science candidates will obtain some teaching experience during their tenure.

Research and Scholarly Activities

The chemistry department offers diverse research opportunities in the four traditional areas of analytical, inorganic, organic, and physical chemistry. A list of faculty and their research interests is available. For students who are planning an academic career, the department offers participation in a highly innovative Preparing Future Faculty program which includes coursework, mentoring, and teaching experience.

Resources

The chemistry department is located in Parsons Hall which is named after Charles L. Parsons, former department head. In addition to classrooms and offices, Parsons Hall provides ample modern laboratory space and houses an excellent branch library and the University Instrumentation Center. The Chemistry Library is a user-friendly facility which contains nearly 20,000 books and reference works, as well as over 175 research journals. Campus-wide 24 hour on-line access is provided to Beilstein and SciFinder Scholar. The University Instrumentation Center includes 500 and 400 MHz Varian nuclear magnetic resonance (NMR) spectrometers, a Bruker 360 MHz NMR, FT-IR, GC-MS, UV-VIS, X-ray PES, polarimetry, scanning and transmissive electron microscopy, and energy dispersive spectroscopy. Other chemistry instrumentation provides for atomic absorption, HPLC, electron paramagnetic resonance, thermal analysis, Mossbauer and fluorimetry. Workstations are available for molecular modeling with Gaussian, Spartan, and other programs.

Opportunities for Graduates

In recent years, chemistry graduate students who complete the M.S. or Ph.D. degrees have enjoyed outstanding job opportunities in industry or academics. Most M.S. students go directly into industry, often finding well-paid employment with one of the Northeast region's many pharmaceutical or biotechnology companies. Ph.D. students find employment in the same industries or go into college-level teaching jobs, often after completing postdoctoral work at another institution or government laboratory.

Courses

800	Chemistry Teaching Seminar	1 cr.
808	Spectroscopic Investigations of Organic Molecules	1 to 4 cr.
855	Advanced Organic Chemistry	3 cr.
862	Instrumental Methods of Chemical Analysis	3 cr.
874	Inorganic Chemistry	3 cr.
876	Physical Chemistry III	3 cr.
895	Special Topics in Chemistry	2 to 4 cr.
899	Thesis/Problems in Chemistry	6 to 10 cr.
901	Theoretical Organic Chemistry I	4 cr.
902	Theoretical Organic Chemistry II	3 cr.
903	Advanced Inorganic Chemistry I	3 cr.
904	Advanced Inorganic Chemistry II	3 cr.
905	Advanced Physical Chemistry I	3 cr.
906	Advanced Physical Chemistry II	3 cr.
907	Introduction to Research	2 cr.
911	Synthetic Organic Chemistry I	3 cr.
912	Synthetic Organic Chemistry II	3 cr.
917	Special Topics in Organic Chemistry	2 or 4 cr.
918	Special Topics in Organic Chemistry	2 or 3 cr.
926	Physical Chemistry of Solutions	3 cr.
930	Advanced Optical Methods	3 cr.
931	Advanced Electrochemical Methods	2 cr.
932	Statistics and Experimental Design	2 cr.
933	Chemical Separations	3 cr.
934	Chemical Equilibria	2 cr.
935	Analytical Instrumentation	3 cr.
947	Inorganic Biochemistry	3 cr.
971	Teaching and Learning Chemistry	3 to 4 cr.
995	Colloquium in Chemistry	1 to 4 cr.
996	Colloquium in Chemistry	1 to 4 cr.
997	Seminar	1 cr.
998	Seminar	1 cr.
999	Doctoral Research	

Civil Engineering (CIE)

Professors: Jean Benoit, Michael R. Collins, Pedro A. de Alba, David L. Gress, Nancy E. Kinner
Research Professor: T. Taylor Eighmy
Associate Professors: Thomas P. Ballestero, Raymond A. Cook, Charles H. Goodspeed, Robert M. Henry, James P. Malley
Assistant Professor: Robert E. Steffen
Research Assistant Professors: Larry K. Brannaka, Kevin H. Gardner

Degree Offered

The Department of Civil Engineering offers the master's degree in civil engineering with the following areas of specialization: structural/materials, geotechnical, water resources, and environmental engineering. Interested applicants are encouraged to write the graduate program coordinator for specific information on current research in the department.

An engineering Ph.D. program with an option in civil engineering is also available.

Admission Requirements

An applicant must have completed a baccalaureate degree in engineering, math-

ematics, or science at an accredited college or university. If coursework or laboratory experience is deficient, an admitted student will be required to fulfill, without graduate credit, all undergraduate prerequisites for graduate courses. In some cases the student's adviser may require additional undergraduate courses in order to achieve a well-integrated program of study.

M.S. Degree Requirements

A student in the master's program may elect either a thesis (minimum of 25 course credits and 6 thesis credits) or nonthesis (minimum of 31 course credits and a 0-credit project) option. For the thesis option, a formal oral presentation/thesis defense is required. A student electing the nonthesis option is required to prepare a noncredit project paper and give a final oral presentation/project defense. In addition to the paper, the nonthesis candidate must pass a departmental comprehensive examination on fundamental engineering concepts prepared and evaluated by the candidate's advisory committee.

For graduation, a B average must be achieved. All students are required to register for Civil Engineering Seminar (CIE 900) for one semester.

Ph.D. Option Requirements

Following admission into the program, a guidance committee is appointed for the student by the Dean of the Graduate School upon recommendation of the graduate coordinator. This committee assists in outlining the student's course of study and may specify individual coursework requirements.

Within 18 months after admission, the student must pass both written and oral qualifying exams. the student must successfully complete at least 24 credit hours beyond a master's degree or 48 hours beyond a bachelor's degree.

Minor Requirements: An identifiable group of courses, approved by the guidance committee and providing a minimum of 9 credits in an area outside of the civil engineering department which is representative of research and/or career goals, must be successfully completed to provide a minor to the Ph.D. degree. A minor may be satisfied by courses taken toward a master's degree other than civil engineering, but the credits will not be applied against the 24 semester credit hour minimum.

Language or Research Tool: Students are required to gain or prove proficiency in a language or research tool in an appropriate area, such as: mathematics, statistics, or data analysis; laboratory analysis or procedures; instrumentation; computer programming; or a foreign language suitable to the area of concentration. The proposed language or research tool must be approved of by the guidance committee and may be completed through the successful completion of coursework, an examination, or both.

Teaching Experience: One semester's work as a teaching assistant or comparable experience is required unless the student was previously a teaching assistant while a graduate student. The guidance committee will evaluate whether a student's past teaching assistantship satisfies this requirement.

Doctoral Candidates: Upon successful completion of the Ph.D. qualifying examinations and the language or research tool requirement, a doctoral student is advanced to the status of doctoral candidate.

Upon achieving candidacy, a doctoral committee is established. The doctoral committee directs research, conducts a semi-annual review of the student's progress, supervises and approves the doctoral dissertation, and administers the final examination (also known as the dissertation defense).

Upon completion of the dissertation and with the approval of the doctoral committee, the student schedules an oral defense in accordance with the requirements of the Graduate School.

Courses

821	Pavement Design	3 cr.
822	Properties and Production of Concrete	3 cr.
839	Industrial Wastewater Treatment	3 cr.
840	Public Health Engineering	3 cr.
841	Open Channel Flow	3 cr.
842	Solid and Hazardous Waste Engineering	4 cr.
845	Engineering Hydrology	3 cr.
848	Solid and Hazardous Waste Design	3 cr.
849	Water Chemistry	4 cr.
855	Design of WaterTransmission Systems	4 cr.
856	Environmental Engineering Microbiology	4 cr.
857	Coastal Engineering and Processes	3 cr.
860	Foundation Design I	4 cr.
861	Foundation Design II	3 cr.
862	Introduction to Geotechnical Earthquake Engineering	3 cr.
863	Geological Engineering	3 cr.
866	Introduction to Geo-Environmental Engineering	3 cr.
874	Reinforced Concrete Design	4 cr.
878	Issues in Engineering Practice and Management	3 cr.
882	Timber Design	3 cr.
883	Matrix Structural Analysis and Modeling	3 cr.
886	Introduction to Finite Element Analysis	3 cr.
889	Project Management	3 cr.
891	Prestressed Concrete	3 cr.
892	LRFD Bridge Design	3 cr.
893	Structural Design in Steel	3 cr.
895	Independent Study	1 to 4 cr.
896	Special Topics in Civil Engineering	1 to 4 cr.
897	Special Topics in Environmental Engineering	1 to 4 cr.
899	Master's Thesis	6 cr.
900	Civil Engineering Seminar	1 cr.
940	Hydrologic Monitoring	3 cr.
942	River Mechanics	3 cr.
943	Advanced Hazardous Waste and Environmental Sampling and Analysis	4 cr.
944	Advanced Physicochemical Treatment Design	4 cr.
945	Advanced Groundwater Topics	3 cr.
946	Advanced Bioenvironmental Engineering Design	4 cr.
960	Advanced Soil Mechanics	3 cr.
961	In Situ Geotechnical Testing	3 cr.
995	Civil Engineering Problems	2 to 4 cr.
999	Doctoral Research	

College Teaching (GRAD)

Professors: Christopher F. Bauer, Victor A. Benassi, Walter F. Eggers, Edward J. O'Brien, Lee F. Seidel, Sally Ward
Adjunct Professors: Leila V. Moore, Daniel Reagan
Associate Professors: Victoria L. Banyard, Patricia D. Bedker, Cinthia Gannett, Marc W. Herold, Dawn C. Meredith
Adjunct Associate Professors: Michael J. Lee, Harry J. Richards
UNHM Associate Professors: John J. Cerullo, Terry M. Savage
Adjunct Assistant Professor: Cheryl M. Jorgenson
UNHM Assistant Professor: Karla E. Vogel

Degrees Offered

The college teaching program prepares graduate students for academic teaching positions. Students must be ready to effectively teach in their field or discipline upon completion of program requirements. The transfer and relationship between theory and research and instructional practice is emphasized in all courses. It is a University-

The Environmental Research Group (ERG) conducts externally sponsored research in partnership with industry, communities, federal agencies, and international organizations.

David Gaithuma

M.S., Civil Engineering

"With my adviser, Associate Professor James Malley, I'm studying the ultraviolet disinfection of water and waste water," says David Gaithuma, who earned his undergraduate degree in resource economics. "We take water samples from a drinking plant and expose it to a beam of light in order to disinfect it. Then we test to see if our indicator organism, the MS-2 virus, is present and, if so, to what degree.

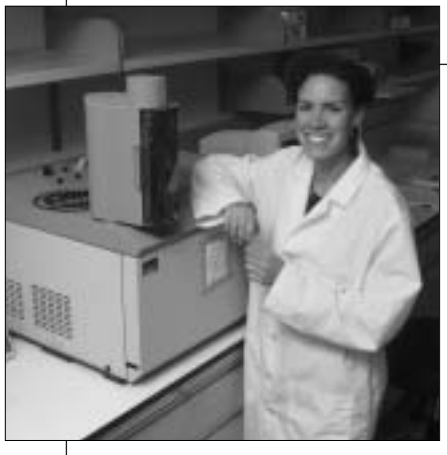
"Right now we're testing water from the Potomac River around Washington D.C. and from another area in Winnipeg, Canada. Soon we'll be testing water from Ware, Massachusetts."

Melanie Martin-Doole

M.S., Civil Engineering

"Chlorine has long been used to disinfect drinking water, but it produces numerous by-products that are unhealthy for people and for the environment," says Melanie Martin-Doole, who earned her undergraduate degree in microbiology. "Disinfecting drinking water with chloramines produces fewer disinfection by-products, but there is one by-product species, haloacetic acids, that is not well understood.

"The chloramination process is currently in limited use, but my research with Professor Robin Collins is to see if the process can be further characterized and controlled to facilitate acceptance in the drinking water industry."



Dalia Hildebrand

M.S., Civil Engineering

In 1996 there was an oil spill near Portland, Maine, and it contaminated a salt marsh, which is now the site of Dalia Hildebrand's research with Professor Nancy Kinner and Associate Professor Tom Ballestero.

"I'm interested in natural mechanisms to clean environmental contamination," says Hildebrand, who earned her undergraduate degree in chemical engineering. "My thesis is concerned with evaluating different treatments to optimize the rate that naturally occurring microbes eat the oil in the marsh.

"We have five years of sediment samples from drilled columns in the marsh and are testing some natural mechanisms to promote bioremediation."

Photos: Doug Prince

wide program coordinated by the Office of the Dean of the Graduate School involving the University Teaching Excellence Program and faculty members from many fields and disciplines. Two academic programs are offered: the Cognate in College Teaching and the Master of Science for Teachers.

Admission Requirements

Applicants to the cognate or M.S.T. programs must have completed one year in a doctoral program at UNH and have the support and recommendation of their doctoral program coordinator. The M.S.T. program is also available to faculty members and doctoral students from other universities. Students in master's only programs at UNH may be eligible to enroll in an M.S.T. as a dual degree.

The Cognate in College Teaching Requirements

This program requires the satisfactory completion of 12 academic credits and emphasizes the development of classroom teaching skills in a specific field or discipline. Students elect, with the permission of their graduate coordinator, to add the cognate to their graduate degree. The cognate will be awarded at the time of the award of the qualifying graduate degree. Requirements include 4 credits in the GRAD 950 series, including GRAD 950, Issues in College Teaching. Students also complete a minimum of 4 credits in field and disciplinary studies related to teaching in their specific area of graduate study. A list of approved graduate level courses for field and disciplinary studies is available and includes courses in the GRAD 970 and 980 series. All students also must complete 4 credits in GRAD 990, College Teaching Praxis.

Master of Science for Teachers Degree Requirements

Building upon the basic foundation in college teaching, the M.S.T. program adds advanced studies in specific content related to teaching and learning from many fields, the evolving role and function of the professor in higher education and post secondary academic institution, and specific methods related to pedagogical improvement and research. Completion of the M.S.T. as a dual degree with the Ph.D. may lengthen the time usually needed to earn the doctoral degree. Under no circumstances will the M.S.T. be awarded to a doctoral student who fails to complete the doctoral degree.

Requirements include core requirements of 16 credits from the GRAD 950 and 960 series of courses. Required courses include GRAD 950, 951, 961, and 965. Many GRAD 950 and GRAD 960 series courses are available using alternative scheduling that rely upon computer-mediated interaction with the instructors. Students also complete a minimum of 8 credits in field and disciplinary studies related to their specific area of graduate study. A list of approved courses for field and disciplinary studies is available and includes courses in the GRAD 970 and 980 series. All students also must complete 8 credits in GRAD 990, College Teaching Praxis.

Some graduate programs have requirements that complement the requirements of these University-wide future faculty programs. In these instances, formal articulating agreements insure fully coordinated programs so that students are not required to duplicate requirements. Information on existing articulation agreements is available from the coordinator of this program or specific graduate program directors.

Permission to enroll in GRAD 990, Teaching Praxis, is dependent upon the student's readiness to be an effective instructor. Readiness is determined by the coordinator based upon the recommendation of the faculty. Permission to enroll in GRAD 990 is also based upon the satisfactory completion of prerequisite requirements and the ability to communicate effectively in a college classroom as an instructor. Students may be required to submit evidence to verify this ability to communicate effectively in a classroom as a prerequisite. Responsibilities as a teaching assistant are insufficient to demonstrate the competencies needed to complete GRAD 990, College Teaching Praxis.

Courses

950	Issues in College Teaching	1 cr.
951	Teaching with Writing	2 cr.
952	College Teaching Mentorship	1 cr.
953	Readings in College Teaching	1 to 2 cr.
954	Teaching with Digital Technology	1 cr.
959	Advanced Issues in College Teaching	1 cr.
961	Cognition, Teaching, and Learning	2 cr.
962	Academic Citizenship	2 cr.
963	College Students and the Undergraduate Culture	2 cr.
965	Classroom Research and Assessment Methods	2 cr.
970	Special Topics in College Teaching	2 to 4 cr.
971	Teaching and Learning in Science	3 to 4 cr.
974	Teaching Sociology Seminar	4 cr.
975	College Teaching in the Life Sciences and Agriculture	2 cr.
976	Seminar in the Teaching of Social and Behavioral Science	3 cr.
977	Physics Teaching Seminar	1 cr.
978	Teaching Economics	4 cr.
981	Graduate Seminar in Teaching History	2 cr.
990	College Teaching Praxis	3 to 4 cr.
995	Independent Study	1 to 4 cr.

Communication Sciences and Disorders (COMM)

Professor: Stephen N. Calculator
Associate Professors: Steven P. Bornstein, Frederick C. Lewis, Penelope E. Webster
Adjunct Associate Professors: John M. O'Day, Marjorie Korff Stock, Mark R. Windt, M.D.
Assistant Professor: Christine G. Guarino
Research Assistant Professor: Rae M. Sonnenmeier
Adjunct Assistant Professor: Lygia Soares

The graduate program integrates an array of academic and clinical experiences to prepare students for a variety of careers in speech-language pathology. Graduates work in multiple settings across the U.S. Students learn about the science and art of communication, its processes and disorders. Faculty and students are actively engaged in research activities. Their projects include examinations of the efficacy of language intervention for adults with aphasia, assessment of central auditory processing, management of dysphagia, functional outcomes of augmentative and alternative communication, role of communication in fostering inclusive education, phonological awareness and its relationship to reading and writing disorders, and ways of enhancing the process of clinical supervision. A special aspect of the program is its clinical supervisors' active engagement in applied research. An atmosphere of collegiality and collaboration fosters interactions between faculty and students.

Degree Offered

The Department of Communication Sciences and Disorders offers the master of science degree. Students are prepared to practice in a variety of job settings within the field of speech-language pathology, and to meet the academic and practicum requirements of the American Speech-Language-Hearing Association (ASHA) for the Certificate of Clinical Competence in speech-language pathology. The program is accredited by the Council on Academic Accreditation of ASHA.

Admission Requirements

Applicants for admission should possess a bachelor's degree in communication sciences and disorders or its equivalent. The following courses, or their equivalents, are undergraduate prerequisites for the master's program: COMM 521, Anatomy and Physiology of the Speech and Hearing Mechanism; COMM 522, Language Acquisition; COMM 523, Clinical Observation; COMM 524, Phonetics; COMM 704, Basic Audiology; COMM 777, Speech and Hearing Science. In addition, a course in statistics is required. Students are also encouraged, but not required, to have completed introductory coursework in human anatomy and physiology, linguistics and normal human development in preparation for fulfillment of ASHA requirements.

Applicants with degrees in related fields may be admitted to the Graduate School as provisional students, with the expectation that they complete the above prerequisites prior to, or concurrent with, graduate courses. A specially designed curriculum is available to provisionally admitted students. They may also choose to complete undergraduate prerequisites through the Division of Continuing Education.

Acceptance to the communication sciences and disorders program is based primarily on grade-point average, and GRE (Graduate Exam Record Examination general test scores). Generally, students must have earned a minimum grade-point average of 3.00 to be considered for admission. Letters of recommendation are considered, particularly for the awarding of scholarships, assistantships, and other sources of support.

M.S. Degree Requirements

Required Courses

The following courses are required of all students: KIN 806, Neurology; COMM 900, Articulatory and Phonological Disorders in Children; 901, Dysphagia; 902, Stuttering; 904, Aphasia in Adults; 905, Motor Speech Disorders; 906, Voice Disorders; 907, Advanced Seminar in Aural Rehabilitation; 908, Language and Learning Disabilities in School-Age Children; 910, Clinical Practicum; 911, Off-Campus Clinical Practicum; 912, Language Disorders in Early Childhood; EDUC 981, Methods and Techniques of Educational Research; 920, Seminar (at least 2 credits), or an equivalent course approved by the program. Students may elect a thesis or nonthesis option, with the latter requiring successful completion of Comprehensive Exams at the conclusion of their program.

Electives

Electives supplement required courses to meet academic and clinical requirements for certification by the American Speech-Language-Hearing Association. Graduate seminars are generally offered in traumatic brain injury and cognitive communicative impairments, writing in children with language disorders, and augmentative and alternative communication.

Clinical Practicum

The number of credits needed by students may vary depending on previous undergraduate experiences. Students must meet the practicum requirements for certification by the American Speech-Language-Hearing Association, including practicum in at least three different practicum sites.

Written Examination

All students except those selecting the thesis option must pass a written comprehensive examination designed to assess their mastery of the professional concepts of communication sciences and disorders in the areas of normative processes, pathologies, and remediation.

Thesis Option

Students may elect the option of writing a thesis. Upon completion of the research project, a student must defend the thesis in an oral examination and must gain approval of the thesis committee. Six credits will be awarded for satisfactory completion of a thesis.

Courses

880	Diagnosis of Speech and Language Disorders	3 cr.
895	Special Topics in Communication Disorders	1 to 3 cr.
899	Master's Thesis	6 cr.
900	Articulatory and Phonological Disorders in Children	3 cr.
901	Closed Head Injury/Dysphagia	3 cr.
902	Stuttering	3 cr.
904	Aphasia in Adults	3 cr.
905	Motor Speech Disorders	3 cr.
906	Voice Disorders	3 cr.
907	Advanced Seminar in Aural Rehabilitation	3 cr.
908	Language and Learning Disabilities in School-Age Children	3 cr.
910	Clinical Practicum	1 to 3 cr.
911	Off-Campus Clinical Practicum	3 cr.
912	Language Disorders in Early Childhood	3 cr.
920	Graduate Seminar	1 to 6 cr.

Computer Science (CS)

Professors: R. Daniel Bergeron, Pilar de la Torre, Eugene C. Freuder, Philip J. Hatcher, T. M. Sparr, Colin Ware
Associate Professors: Robert D. Russell, James L. Weiner
Adjunct Associate Professor: Sylvia Weber Russell
Assistant Professors: Radim Bartos, Michel Charpentier, Elizabeth Varki
Adjunct Assistant Professors: Elise H. Turner, Roy M. Turner

Degrees Offered

The Department of Computer Science offers programs leading to the master of science and the doctor of philosophy degrees. A major emphasis in these programs is the blending of theoretical and applied aspects of computer science. Students pursuing a specialization in computer science theory are required to develop a strong background in systems and are encouraged whenever possible to identify applications for theory. Similarly, students specializing in applied areas of computer science are required to base their work on strong theoretical foundations.

Admission Requirements

Applicants are expected to have studied high-level language programming, data structures, analysis of algorithms, operating system fundamentals, programming language concepts, and discrete mathematics. Further experience in computer science, mathematics, and/or electrical engineering is beneficial, but not required. In addition, students with a strong academic record, but without a computer science background, may be admitted on a provisional basis.

All applicants must submit general test scores from the Graduate Record Examination. Computer science subject test scores are recommended, but not required.

M.S. Degree Requirements

For the M.S. degree, the student may choose among three options: thesis, examination, and project. All options require the completion of CS 900 (1-credit graduate seminar).

The thesis option requires eight additional courses numbered 800 or above (two must be above 900), plus 6 credits of thesis work for a total of 31 credits.

The examination option requires ten additional courses numbered 800 or above (three must be above 900): four must be distributed among subject categories. The exam option also requires passing a comprehensive written final examination on four subject areas for a total of 31 credits.

The project option requires ten additional courses numbered 800 or above (three must be above 900): four must be distrib-

uted among subject categories. The project option requires 3 credits of additional M.S. project work and the completion of a final project under the direction of a faculty adviser, for a total of 34 credits.

Ph.D. Degree Requirements

Following the student's entrance into the program, a guidance committee will be appointed by the Dean of the Graduate School to review the student's preparation for pursuing a particular program and to assist in outlining a program of study. The program of study will include courses in both the theoretical and applied aspects of computer science as determined by the guidance committee. Normally a student will be expected to complete at least the equivalent of sixteen semester courses (of at least 3 credits each) beyond the bachelor's degree, or eight courses beyond the master's degree.

In addition, each doctoral student is required to acquire competence in the use of a research tool determined by the guidance committee. The research tool should contribute to the student's dissertation research and is expected to consist of courses from disciplines outside computer science, such as mathematics, engineering, psychology, or linguistics, as determined by the guidance committee.

Every doctoral student must pass a written qualifying exam consisting of two major components: a breadth requirement and a depth requirement. The breadth requirement consists of a written examination covering four major areas of computer science. The depth requirement has three parts: a written survey of relevant literature, a written research report focused on an area of research, and an oral examination.

A student is admitted to candidacy for the Ph.D. after successfully completing the qualifying examination and the research tool requirement. A doctoral committee will be appointed by the Dean of the Graduate School for the purpose of approving and monitoring the candidate's dissertation work and administering the final dissertation defense. The doctoral candidate must make a formal presentation of the proposed research work, including both written and oral components, prior to undertaking the major research effort. Upon completion of the research, the candidate must present a written dissertation and a formal oral defense.

Courses

812	Compiler Design	3 cr.
818	Software Engineering	3 cr.
819	Object-Oriented Methodology	3 cr.
820	Operating System Programming	3 cr.
821	Operating System Kernel Design	3 cr.
825	Computer Networks	3 cr.
830	Introduction to Artificial Intelligence	3 cr.
835	Introduction to Parallel and Distributed Programming	3 cr.
845	Correctness in Program Construction	3 cr.
860	Introduction to Human-Computer Interaction	3 cr.
867	Interactive Data Visualization	3 cr.
870	Computer Graphics	3 cr.
875	Database System Principles	3 cr.
880	Topics in Computer Science	3 cr.
898	Master's Project	3 cr.
899	Master's Thesis	6 cr.
900	Graduate Seminar	1 cr.
920	Advanced Operating Systems	3 cr.
925	Advanced Computer Networks	3 cr.
929	Collaborative Computing	3 cr.
941	Design and Analysis of Algorithms	3 cr.
959	Theory of Computation	3 cr.
970	Advanced Computer Graphics	3 cr.
975	Object-Oriented Database Systems	3 cr.
980	Advanced Topics in Computer Science	3 cr.
981	Advanced Topics in Database Systems	3 cr.
982	Advanced Topics in Computer Networks	3 cr.
983	Advanced Topics in Artificial Intelligence	3 cr.
985	Advanced Topics in Operating Systems	3 cr.
986	Advanced Topics in Program Correctness	3 cr.
988	Adv Top/Computer Graphics	3 cr.
989	Advanced Topics in Algorithms	3 cr.
998	Reading/Computer Science	1 to 6 cr.
999	Doctoral Research	

Continuous Registration (GRAD)

Unless a leave of absence is granted, graduate students are required to maintain continuous enrollment each semester of the academic year until their degree is formally awarded by registering for course credits, research or continuing enrollment. **Master's** students must enroll for course credits, thesis credits, Master's Continuing Research (GRAD 900), or Continuing Enrollment (GRAD 800). **CAGS** students must enroll for course credits or Continuing Enrollment (GRAD 800). **Pre-candidacy doctoral** students must enroll for course credits, Doctoral Research (999), or Continuing Enrollment (GRAD 800). **Doctoral candidates** must register for Doctoral Research (999) each semester after advancement to candidacy until their doctoral degree is conferred, even if the minimum requirement (two semesters) has been met.

Students enrolled in **summer only** programs—currently English M.S.T., Math M.S.T., and College Teaching M.S.T.—are required to enroll in course credits or GRAD 800 each summer until their degree is formally awarded.

Courses

800	Continuing Enrollment	
900	Master's Continuing Research	

Earth, Oceans, and Space, Institute for the Study of (EOS)

The Institute for the Study of Earth, Oceans, and Space offers students the opportunity for interdisciplinary study and research. Certain graduate degree programs in earth sciences, physics, natural resources, and zoology may be accessed through the institute as follows: all the M.S. and Ph.D. programs in earth sciences, the specialization in space physics and astrophysics (M.S. and Ph.D.) in physics, the marine ecology specialization in zoology (M.S. and Ph.D.), and the departmental (M.S.) or interdepartmental (Ph.D.) program in natural resources. Admission and degree requirements are set by the respective departments or program. In addition, EOS students are required to participate in an EOS interdisciplinary seminar and are encouraged to elect specialized courses on the various components of the Earth and Space System. See the graduate program descriptions in earth sciences, physics, zoology, natural resources, and the natural resources Ph.D. program (NRP) for admission and degree requirements.

Courses

812	Physics of the Ionosphere	4 cr.
813	Biogeochemical Dynamics	3 cr.
815	Global Atmospheric Chemistry	3 cr.
816	Atmospheric Aerosol and Precipitation Chemistry	3 cr.
817	Macro-Scale Hydrology I	4 cr.
818	Macro-Scale Hydrology II	4 cr.
830	Terrestrial Ecosystems	3 cr.
831	Systems Approach to Biological Ocean Science	3 cr.
850	Biological Oceanography	4 cr.
854	Ocean Waves and Tides	4 cr.
864	Introduction to Paleoclimate Analysis	4 cr.
865	Natural Climate Variability	4 cr.
895	Topics in Earth, Oceans, and Space	1 to 4 cr.
901	EOS Seminar	1 cr.
955	Geophysical and Astrophysical Fluid Dynamics	3 cr.
964	Advanced Paleoclimate Analysis	4 cr.
987	Magnetospheres	3 cr.
988	High Energy Astrophysics	3 cr.
995	Special Topics in Earth, Oceans, and Space Science	1 to 4 cr.

Profile

John Mabry

Ph.D. student, Chemistry
Cognate in College Teaching

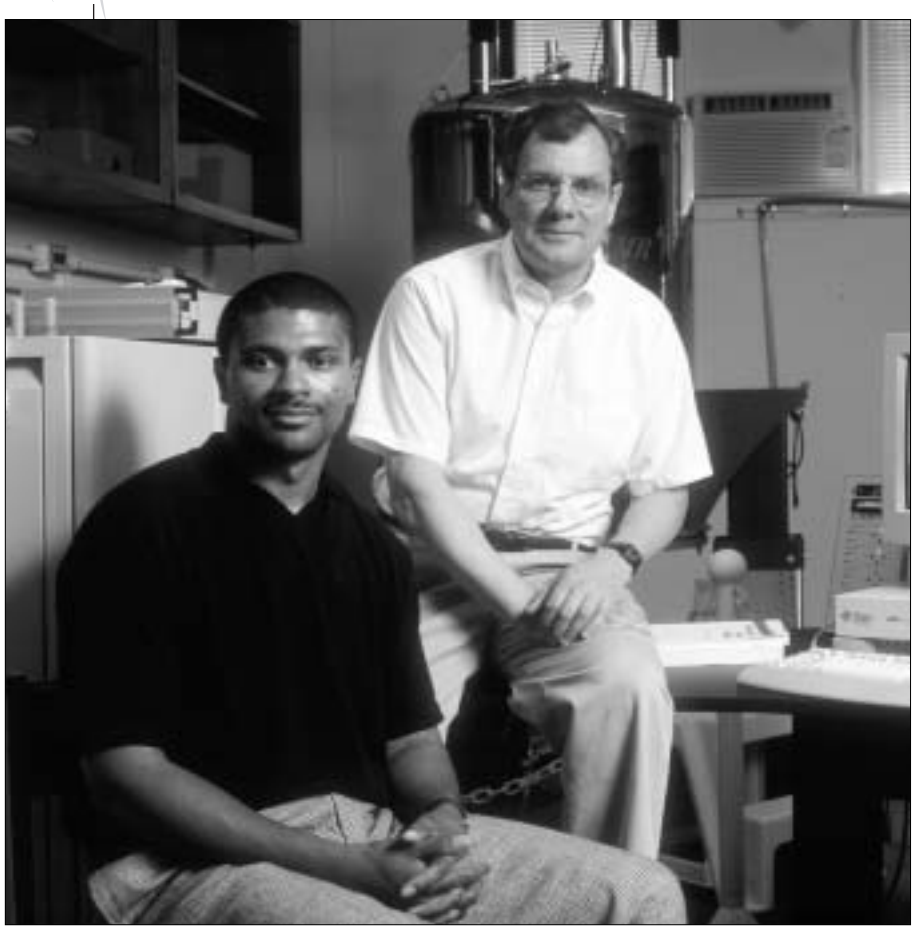
"By no means did I have a beaker in my hand at age three," say John Mabry, "but I've always loved science." As an undergraduate at Hampton University, he began as a chemical engineering major, but after taking organic chemistry, his interest was sparked.

At UNH, Mabry is a member of Professor Richard Johnson's research group. "The work we do is exciting and cutting edge," says Mabry. "We create molecules that you won't see in sophomore organic chemistry textbooks."

In fact, the reactive molecules they create often exist for only a fraction of a second, but expand the limits of known molecular structures. "We can't detect them directly but we can look at the outcome of our samples and then extrapolate what happened," says Mabry.

Johnson's research group comprises three graduate students and one undergraduate. "We meet weekly and interact throughout the week as well. It's a supportive and friendly group," Mabry adds.

During the academic year, Mabry is a teaching assistant, a role he enjoys. He looks forward to becoming a college professor, combining research and teaching.



Photos: Lisa Nugent

Graduate student John Mabry (left) and Professor Richard Johnson.

To create "strained" molecules, Johnson and Mabry insert a sample into a 500 MHz Nuclear Magnetic Resonance (NMR) spectrometer. The chemistry department recently installed two new NMR spectrometers in a state-of-the-art facility in Parsons Hall.

Earth Sciences (ESCI)

Professors: Francis S. Birch, Wallace A. Bothner, S. Lawrence Dingman, Theodore C. Loder III, Larry A. Mayer, Karen L. Von Damm
Research Professors: Janet W. Campbell, Patrick M. Crill, Dork L. Sahagian, Robert W. Talbot, Charles J. Vorosmarty
Adjunct Professors: Wendell S. Brown, Paul A. Mayewski
Associate Professors: J. Matthew Davis, Jo Laird
Research Associate Professors: Jack E. Dibb, Michael L. Prentice, Larry G. Ward
Adjunct Associate Professors: Barry D. Keim, Neal R. Pettigrew, Gregory A. Zielinski
Assistant Professors: William C. Clyde, James M. Pringle
Research Assistant Professors: Stephen E. Frolking, Cameron P. Wake
Adjunct Assistant Professor: Frank L. Bub

Graduate programs in earth sciences provide a unique opportunity to study earth and environmental sciences at the local, regional, and global scale. The University of New Hampsire is geographically well situated for studies in the earth sciences. The Atlantic Ocean is a 30-minute drive from campus, the Great Bay Estuary tidal waters reach within one-half mile of the campus, and the White Mountains are only a 90-minute drive to the north. Superimposed on this natural backdrop are the challenges created by a growing U.S. population and resulting pollution threats to the environment. In addition to these local opportunities, UNH faculty and students conduct research throughout the world, traveling to remote areas such as Antarctica, Greenland, the Pacific and Indian Oceans, Mexico, China, the Himalayas, Indonesia, Pakistan, and the Western U.S.

Research areas cover all the earth system components. The graduate programs in earth sciences have strong ties with those in natural resources providing important linkages between the physical, chemical, and biological systems. More detailed information on faculty and research interests is available at: www.unh.edu/esci/.

The faculty of the Department of Earth Sciences maintain offices, laboratories, and other facilities in four buildings on campus, and interact regularly with several established campus research centers. Department facilities include a suite of computational, geophysical, geochemical, and field mapping equipment as well as local field sites for instruction and research. Additional facilities are available through cooperation with other departments and research centers. Many earth sciences faculty members are affiliated with one of several research centers in the Institute for the Study of Earth, Oceans, and Space (EOS). We also have affiliations and ongoing collaborations with the Center for Coastal and Ocean Mapping, the Jackson Estuarine Laboratory, and the Environmental Research Group.

Graduates of the earth sciences graduate degree programs have been very successful in pursuing employment, particularly in education, conduct research at national laboratories and universities, and work with environmental consulting companies with emphases in groundwater remediation and water supply, and local, state, and federal agencies in areas of the environment and natural resources.

Degrees Offered

The Department of Earth Sciences offers the master of science and doctor of philosophy degrees in earth sciences with options in geology and oceanography and a specialization in geochemical systems. The department also offers the master of science degree in hydrology and specialization at the Ph.D. level. The master of science degree with an option in ocean mapping complements the geology and oceanography options. Graduate students in the department may conduct research through the Institute for the Study of Earth, Oceans, and Space.

Emphasis in the geology option may be placed upon petrology, mineralogy, structural geology, tectonics, geophysics, sedimentation, glacial geology, paleoclimates, glaciology, hydrogeology, stratigraphy, paleontology, low- or high-temperature geochemistry, and isotope geochemistry.

Concentration in the oceanography option may be placed upon chemical, geological, or physical oceanography. Although the broad scope of oceanography will be presented, the program emphasizes estuarine, coastal, continental margin processes and environments, and mid-ocean ridges.

The hydrology specialization is intended for students with an interest in fluvial processes, global-scale hydrology, groundwater hydrology, hydroclimatology, surface-water hydrology, water quality, and quantitative hydrology.

The geochemical systems specialization is intended for students with an interest in all aspects of geochemistry: bedrock, sediment, water, ice, and air with particular emphasis on interpreting and modeling the interaction of these media; biogeochemistry; and climate change.

The ocean mapping option is intended for students with an interest in hydrography and hydrographic survey technology.

Admission Requirements

An applicant is expected to have completed one year each of college chemistry, physics, and calculus; to have an undergraduate major or equivalent in geology, chemistry, physics, mathematics, engineering, or the biological sciences; and to present scores from the general test of the Graduate Record Examination. Students lacking some background in a particular area may be admitted provided they are prepared to complete courses, without graduate credit, in which they may be deficient. The program of study (geology, hydrology, oceanography, ocean mapping, or geochemistry) a student wishes to follow, as well as the student's undergraduate major determines the level of preparation necessary. The preparation of each student is determined before the beginning of the first semester in residence in order to plan the course of study. Each entering student is assigned an academic adviser to assist in planning a program of study. Normally, students are required to have completed a master's degree before entering the Ph.D. program.

M.S. Degree Requirements

Students in the M.S. programs are required to complete the core curriculum for their respective areas. Students in the thesis option must satisfactorily complete 30 credits, which includes the credits accumulated in the core curriculum. Students in this option must complete a master's thesis and give an oral presentation of the results.

Students in the non-thesis option must satisfactorily complete 34 credits, which includes the core curriculum, a 2-credit directed research project, and a written and oral presentation of that research.

All students are required to participate in the instructional activities of the department.

Geology

The core curriculum for the option in geology normally includes 832, Regional Geology and Advanced Structure; 834, Applied Geophysics; 841, Geochemistry; and 997, Seminar in Earth Sciences (1 cr. first year); and 998, Proposal Development (1 cr. first year).

Hydrology
The core curriculum for the major in hydrology usually includes 805, Principles of Hydrology; 810, Groundwater Hydrology; and 997, Seminar in Earth Sciences (1 cr. first year); and 998, Proposal Development (1 cr. first year).

Ocean Mapping
The core curriculum for the option in ocean mapping normally includes 858, Introductory Physical Oceanography; 859, Geological Oceanography; OE 810, Ocean Measurements Laboratory; 870, Introductory Hydrography; 871, Geodesy and Positioning for Ocean Mapping; 972, Hydrographic Field Course; 997, Seminar in Earth Sciences (1 cr. first year); 998, Proposal Development (1 cr. first year).

Oceanography
The core curriculum for the option in oceanography normally includes 852, Chemical Oceanography, 3 or 4 cr.; 858, Introductory Physical Oceanography; 859, Geological Oceanography; and 997, Seminar in Earth Sciences (1 cr. first year); and 998, Proposal Development (1 cr. first year).

Geochemical Systems
The core curriculum for the specialization in geochemical systems usually includes three courses from 841, Geochemistry; 846, Analytical Geochemistry; 847, Aqueous Geochemistry; 852, Chemical Oceanography; 864, Paleoclimate Analysis; EOS 813, Biogeochemical Dynamics; EOS 815, Atmospheric and Precipitation Chemistry; and 997, Seminar in Earth Sciences (1 cr. first year); and 998, Proposal Development (1 cr. first year).

In each of the above, additional electives are to be selected from 800- and 900-level courses in the department and/or from courses numbered 700 and above in related disciplines outside of the department. More detailed information is available from the department.

Ph.D. Degree Requirements

Course requirements for the Ph.D. program are flexible and are determined by the student's individual guidance committee. In addition, students are required to (1) have a reading knowledge of an appropriate foreign language; (2) pass a preliminary examination, given generally after one year of study; (3) pass a qualifying examination, given generally after two years of study; (4) complete significant original research presented in a dissertation; and (5) pass an oral defense of that work. Ph.D. students are also encouraged to obtain some appropriate teaching experience.

Emphasis in the Ph.D. program may be placed on geology, oceanography, ocean mapping, geochemical systems, or hydrology.

Courses

803	Fluvial Hydrology	4 cr.
805	Principles of Hydrology	4 cr.
810	Groundwater Hydrology	4 cr.
815	Global Atmospheric Chemistry	3 cr.
817	Macro-scale Hydrology I	4 cr.
818	Macro-scale Hydrology II	4 cr.
825	Igneous Petrology	4 cr.
826	Metamorphic Petrology	4 cr.
832	Regional Geology and Advanced Structure	4 cr.
834	Applied Geophysics	4 cr.
841	Geochemistry	4 cr.
846	Analytical Geochemistry	4 cr.
847	Aqueous Geochemistry	4 cr.
850	Biological Oceanography	4 cr.
852	Chemical Oceanography	3 cr.
852L	Chemical Oceanography Lab	1 cr.
854	Sedimentary Rocks and Stratigraphy	4 cr.
855	Analytical Techniques for Sediments	2 to 4 cr.
858	Introduction to Physical Oceanography	3 cr.
859	Geological Oceanography	4 cr.
862	Glacial Geology	4 cr.
864	Introductory Paleoclimate Analysis	4 cr.
865	Natural Climate Variability	4 cr.
870	Introductory Hydrography	3 cr.
871	Geodesy and Positioning for Ocean Mapping	3 cr.
895	Topics in Earth Sciences	1 to 4 cr.
896	Topics in Earth Sciences	1 to 4 cr.
897	Earth Sciences Colloquium	
898	Directed Research	2 cr.
899	Master's Thesis	6 cr.
903	Advanced Hydrology	3 cr.
904	Contaminant Hydrology	3 cr.
906	Statistical Hydrology	4 cr.
934	Advanced Applied Geophysics	4 cr.
952	Advanced Chemical Oceanography	3 or 4 cr.
958	Dynamical Oceanography	3 cr.
959	Data Analysis Methods in Ocean and Earth Sciences	4 cr.
964	Advanced Paleoclimate Analysis	4 cr.
972	Hydrographic Field Course	4 cr.
973	Seafloor Characterization	3 cr.
995	Advanced Topics in Earth Sciences	1 to 4 cr.
996	Advanced Topics in Earth Sciences	1 to 4 cr.
997	Seminar in Earth Sciences	1 cr.
998	Proposal Development	1 cr.
999	Doctoral Research	

Economics (ECON)

Professors: Richard W. England, Evangelos O. Simos, James R. Wible
Associate Professors: Karen Smith Conway, Bruce T. Elmslie, Michael D. Goldberg, Marc W. Herold, Ju-Chin Huang, Richard L. Mills, Neil B. Niman, Torsten Schmidt, Allen R. Thompson
Assistant Professor: Chi-Young Choi

Degrees Offered

The economics program offers the master of arts and the doctor of philosophy degrees.

The master of arts degree in economics may be a final degree for certain occupations and professions. Most students complete the program as a general rather than a specialized degree. The same fields of concentration in the Ph.D. program are available to the master's student as long as appropriate prerequisites are met.

The doctoral program in economics is intended for those students who are interested in research and teaching. The program has the following key features: a series of core courses, two fields of concentration, several significant research requirements, comprehensive exams in economic theory and two fields of concentration, and proficiency in one foreign language. Fields of concentration are environmental and energy economics, development and sustainability, international economics, and public economics.

In addition to these requirements, Ph.D. students may opt to seek the cognate in college teaching. This program, pursued simultaneously with the Ph.D., systematically trains students in pedagogical methods to prepare them for the challenging transition to teaching economics at the college level. The culmination of the cognate is the preparation and defense of a teaching portfolio. A notation appears on the student's transcript when the Cognate in College Teaching is awarded.

The economics program is offered through the Whittemore School of Business and Economics. The school's mission statement can be found under the M.B.A. program description.

Admission Requirements

In addition to requirements established by the Graduate School, the results from the Graduate Record Examination general test must be presented.

The master's program seeks students whose undergraduate experience provides evidence of superior ability and indicates the promise of serious scholarship. Undergraduate preparation will usually include exposure to economic reasoning and methodology, including mathematics and statistics. For those whose backgrounds are deficient, remedial work is available.

The doctoral program expects a master's degree in economics. Previous graduate study of economics is required.

M.A. Degree Requirements

Every student must meet the general requirements of the Graduate School and the following requirements of the major:

1. At least 30 total semester hours, which may include 8 hours of thesis;

2. Of the total hours:

   a. a minimum of 12 hours must be in 900-level courses. These courses must be ECON 972 (Macroeconomics I), ECON 976 (Microeconomics I), and ECON 926 (Econometrics I);

   b. in addition, 2 hours must be in the Graduate Economics Seminar;

   c. a maximum of 4 credit hours may be taken in related disciplines in approved 700-level and above courses;

   d. the remaining credit hours are to be taken in 800-level and above courses.

3. Written evidence of proficiency in economic theory (either by passing the qualifying examination in economic theory or by completing a thesis).

Additional requirements may be associated with the concentrations in environmental and energy economics, development and sustainability, international economics, and public economics. Further information about fields of concentration may be obtained from the department chair. A concentration is not required.

Ph.D. Degree Requirements

Ph.D. candidacy requires the following:

1. Completion of core courses:
   Microeconomics I and II
   Macroeconomics I and II
   Econometrics I and II
   History of Economic Thought
   Topics in Economic Thought and Methodology
2. Comprehensive exams in microeconomics and macroeconomics.
3. Completion of two fields of concentration (including an exam in each field).
4. Participation in the General Economics Seminar for four semesters.
5. Participation in a research workshop for two semesters.
6. Demonstrated knowledge of one foreign language (which may be waived).
7. An accepted dissertation proposal.

There are eight core courses in the program. The two theory exams may be taken separately. Each of the two fields of concentration consists of two sequentially related courses. The foreign language requirement may be waived if the graduate coordinator determines that knowledge of a foreign language is not directly relevant to the student's course of study and research. A continuously integrated approach to research is a highlight of the program. Ph.D. students are required to enroll in the Research Workshop where student and faculty research in progress, as well as finished projects, are presented. While this usually occurs in the third year, students are encouraged to participate informally in the workshop as early as the first year. This activity brings together students and faculty members and encourages the transition from course-related activities to proposing a dissertation topic. The student's formal presentation of a dissertation proposal takes place in the Research Workshop.

Information about fields available for the dissertation as well as other details about the doctoral program can be obtained from the department chair.

Cognate in College Teaching

To complete the Cognate in College Teaching program, a student must submit, and have accepted, a letter of application with a curriculum vitae to the graduate dean after at least one year of full-time graduate studies in economics. Admission to the cognate will be decided by the graduate dean, based upon recommendations of the economics graduate program coordinator and Teaching Excellence Program director. The student must complete specific coursework: GRAD 950 series (4 credits); ECON 898, Teaching of Economics (4-credit seminar, offered every other year); and GRAD 990, College Teaching Praxis (4-credit course, to be completed at least twice during two or more semesters). Finally, the student must submit an approved teaching portfolio. Upon completion of all of these requirements, the Cognate in College Teaching is awarded and noted on the graduate transcript. The cognate cannot be awarded except in conjunction with the Ph.D., and none of the course requirements for the cognate can substitute for requirements for the Ph.D.

Courses

807	Economics of Sustainable Development	4 cr.
820	Time Series Analysis	3 cr.
825	Mathematical Economics	4 cr.
828	Time Series Analysis	3 cr.
836	Seminar in Monetary Theory and Policy	4 cr.
845	International Trade	4 cr.
846	International Finance	4 cr.
847	Multinational Enterprises	4 cr.
868	Seminar in Economic Development	4 cr.
898	Economic Problems	2 or 4 cr.
899	Master's Thesis	8 cr.
926	Econometrics I	4 cr.
927	Econometrics II	4 cr.
957	History of Economic Thought	4 cr.
958	Topics in Economic Thought and Methodology	4 cr.
972	Macroeconomics I	4 cr.
973	Macroeconomics II	4 cr.
976	Microeconomics I	4 cr.
977	Microeconomics II	4 cr.
988	Graduate Economics Seminar	1 cr.
995	Independent Study	6 cr.
996	Research Workshop	2 cr.
999	Doctoral Research	

Education (EDUC)

Professors: Michael D. Andrew, Angelo V. Boy, John J. Carney, Ann L. Diller, Susan D. Franzosa, David J. Hebert, Barbara E. Houston, David L. Howell, Bruce L. Mallory, Sharon N. Oja
Adjunct Professor: Jeanne E. Ormrod
Associate Professors: Eleanor D. Abrams, Grant L. Cioffi, Todd A. DeMitchell, Janet Elizabeth Falvey, Virginia E. Garland, Georgia M. Kerns, Barbara H. Krysiak, Ann L. Loranger, Jane A. Nisbet, Joseph J. Onosko, Judith A. Robb, Paula M. Salvio, Thomas H. Schram, William L. Wansart, Dwight Webb
Adjunct Associate Professor: Harry J. Richards
Assistant Professors: Casey D. Cobb, Elizabeth A. Finkel, E. Scott Fletcher, John F. Hornstein, Justus M. Ogembo, Ruth M. Wharton-McDonald

The Department of Education is part of the UNH Unit for Professionals in Education. The unit's mission is to prepare professional educators who are excellent practitioners and leaders. All professional programs offered by the unit are approved by the New Hampshire State Department of Education.

Degrees Offered

The Department of Education offers a variety of programs leading to the master's degree, the doctor of philosophy degree, and the certificate of advanced graduate study.

The master of arts is offered in counseling. The master of arts in teaching is offered in elementary and secondary education. The master of education is offered in administration and supervision, counseling, early childhood education (including an option in special needs), elementary education, reading,

secondary education, special education and teacher leadership. Special education certification is also available to those who complete the M.A.T. or M.Ed. programs in either elementary or secondary education.

The certificate of advanced graduate study is offered in educational administration and supervision. The doctor of philosophy is offered in education and in literacy and schooling.

The master of science for teachers is offered through the departments of chemistry, english, and mathematics. (See those departments for information.)

Most programs are available to part-time admitted graduate students.

Admission Requirements

In addition to the materials required by the Graduate School, each application must include recent Graduate Record Examination general test scores and a thoughtful, well-written statement of purpose for undertaking graduate study in a particular program.

Individual programs within the department may have additional admissions requirements. Applicants should refer to specific program descriptions. Consultation with a program faculty member is recommended. In all cases, the applicant's relevant experience, references, and professional goals will be considered in the admission process.

Action on applications to Department of Education programs varies by individual program. Admission to programs in early childhood education, educational administration and supervision, and reading is on a rolling basis. Applications for teacher education, counseling (part-time), and special education are acted on during the fall and spring semesters, following deadlines noted in the Graduate School application. Applications for full-time study in the counseling M.Ed. and M.A. programs, as well as the Ph.D. programs in education and in literacy and schooling are acted on only in the spring, following deadlines noted in the Graduate School application. (The middle 50 percent of students admitted to all graduate programs in education the fall 2000 scored between 420 and 550 on the verbal section of the GRE, 440 to 600 on the quantitative section, and 490 to 660 on the analytical section. They also had an average undergraduate grade-point average between 2.96 and 3.54.)

Doctor of Philosophy in Education

Program information: Ann Diller

The Department of Education offers a Ph.D. in education with specialization in fields related to the areas of (1) teacher education, and (2) educational leadership and policy studies. The doctoral program is designed to engender a broad understanding of the field of education by encouraging focused scholarly inquiry grounded in the reality of educational practice. Professors and students work to place educational issues in a philosophical and socio-cultural context. Collaborative projects sometimes move beyond the boundaries of the University into local schools and into national and international settings. The program enrolls full-time and part-time students.

An individual program of study is planned by the student and her or his guidance committee. Each student's program includes a set of common core courses, specialized study, integrated coursework, and research preparation. Students must meet specific University, department, and program requirements. Within this framework individual programs are guided largely by the student's own interests and goals; program can vary widely from student to student. Students are encouraged to engage in research activities or focused inquiry early in their programs.

The Ph.D. in education provides students with preparation for distinguished leadership in a variety of settings. Students who specialize in teacher education are interested in curriculum and instruction and in teacher development at all levels of schooling, ranging from early childhood to adulthood. Students who choose the specialization of educational leadership and policy studies may be interested in the administration of schools, colleges and universities or in pursuing work as policy makers, community agency directors, consultants, and research analysts.

Admission

Students admitted to the program will normally have completed a master's degree in education or a related field and will have worked full time as an educator at the elementary, secondary, or college level. Entering students are expected to have completed graduate-level coursework in educational psychology, curriculum and instruction, educational structure and change, and the philosophical and social foundations of education. Exceptional candidates who do not meet all these prerequisites will be considered.

To apply, candidates must submit a Graduate School application, transcripts of all undergraduate and graduate coursework, and Graduate Record Examination (GRE) general test scores. Candidates must also submit an extended personal essay in addition to the statement required on the Graduate School application. On-campus interviews are recommended.

Degree Requirements

Candidates for the degree must (1) meet admission requirements, (2) develop and complete an approved program of study in consultation with their guidance committee, (3) complete required core coursework, (4) pass a qualifying examination to advance to candidacy, (5) establish a dissertation committee, (6) develop an approved dissertation proposal, (7) write and present the dissertation, and (8) pass the final oral examination.

Program of Studies

Upon acceptance to the program, students are assigned an advisor. (This is initially an administrative decision.) During the first year of study, students identify, either in consultation with their advisor or with the director of doctoral studies, faculty members to serve as their guidance committee. Programs for the doctoral degree in education are planned individually by students and their guidance committees. The program of study consists of four major elements: (1) common core courses, (2) specialization specific to the student's scholarly interests, (3) integrative studies, and (4) research preparation. There are five common core courses required of all students: Proseminar in Doctoral Studies, Critical Inquiry in Education, Normative Inquiry in Education, Qualitative Inquiry in Education, and Quantitative Inquiry: Methods and Techniques of Educational Research. Typically students complete 48 to 60 hours in graduate coursework following their matriculation. These hours do not include doctoral research (EDUC 999).

Qualifying Examination

To be advanced to Ph.D. candidacy, students must satifactorily complete qualifying examinations as well as other program requirements. After completing at least two-thirds of their coursework, students may take the qualifying examination. The examination is a written exam to be developed, supervised, and evaluated by the student's guidance committee. The qualifying examination will be used to evaluate the student's (1) general knowledge in the area of inquiry, and (2) fitness for engaging in research, particularly in the subject proposed for the dissertation.

Profile

Hilary Walter

M.Ed., Elementary Education, May '01

After a few years of a successful career in hotel and restaurant management, Hilary Walter decided that she wanted something else. "I called the director of the UNH Teacher Education Program," recalls Walter, "and left a voice mail about my degree. I just asked, 'Does this work?'"

It did, and soon Walter was enrolled in the first required course for all students in the program, Exploring Teaching. "I knew within a few days that this was the right career decision for me," she says.

Like many of her classmates, Walter is preparing for dual certification in elementary education and English as a Second Language (ESL). "I know that wherever I teach, the ESL population is increasing," says Walter. "I want to know how to modify my teaching to reach them."

Walter chose to do her year-long internship at the Beech Street School in Manchester because it is an inner-city school with a multicultural population.

Photos: Lisa Nugent

Dissertation
To complete the degree, the student must present and defend a dissertation of original research and publishable quality.

Doctor of Philosophy in Literacy and Schooling

Program information: Paula Salvio

The primary purpose of the Ph.D. program in literacy and schooling is to prepare professionals who will conduct research and successfully publish accounts of their work. Within the program and beyond, they study the theory and practice of teaching literacy and become leaders who advocate changes. We want to create classrooms in which the voices of students, as well as those of the teachers, are honored. Research is usually conducted in natural environments, and study within this program is on a full-time basis. Students' backgrounds vary from educators interested in adult education through preschool. Program graduates work in universities, colleges, and various public or private educational settings.

Admission Requirements
Applicants must have at least three years of teaching experience. Although most of our students have a master's degree, it is not required for admission. Applicants must submit a Graduate School application (except for the personal statement); a supplement to the Graduate School application (available from the Writing Lab in the education department); transcripts of all previous coursework; and Graduate Record Examination (GRE) general test scores. We also encourage applicants to come to the University to meet the coordinator of the program.

Degree Requirements
As part of the interdisciplinary program, students will take courses outside of education in the Department of English; in addition it is recommended that they take one course from another University department. The program has two required courses, an 8-credit seminar on research in literacy instruction, and a 4-credit seminar in reading. With faculty assistance, students design a course of study that will ensure they gain expertise in reading and writing instruction, language and cognition, and processes of conducting research. Once they have completed nearly all of their coursework, students will take a qualifying examination. Passing this exam advances students to degree candidacy. They then meet with a committee to discuss the proposal for their dissertation. Once the dissertation is complete, they will then defend their work in an oral session. Students can complete the degree in three years, with two years of concentrated coursework and a third for their dissertation.

Administration and Supervision

Program information: Todd DeMitchell, Virginia Garland, Barbara Krysiak

The Department of Education, in general, and the program in administration and supervision, in particular, are responsible for training educational leaders. Many research studies on effective schools have underscored the pivotal role that strong leadership plays in building and sustaining the health of a good school. The program in administration and supervision fulfills the important mission of training leaders for New Hampshire's as well as the nation's schools.

The Department of Education offers the degree of master of education and the certificate of advanced graduate study in educational administration and supervision.

Master of Education
The program is designed for the experienced teacher who wishes to become qualified in the broad area of supervision and administration, grades K–12. Emphasis is on the elementary and secondary school principalship and instructional supervision. This program leads to certification in New Hampshire as a principal.

The requirements for the degree include the following:

Core requirements (28 credits): 953, Seminar in Curriculum Study; 961, Public School Administration; 962, Educational Finance and Business Management; 965, Educational Supervision; 967, Legal Aspects of School Administration; 969, Practicum in Educational Administration; and 972, Educational Program Evaluation.

Electives (8 credits): Selected in consultation with the program adviser. EDUC 976, The Principalship, is strongly recommended as a elective.

Concluding experience: A degree candidate must successfully complete one of the following: a comprehensive oral examination based on a set of theses statements prepared by the candidate or a major research study related to school administration, curricula, or educational supervision.

Certificate of Advanced Graduate Study
This program is designed for those who possess a master's degree in school administration or graduate study supplemented by work experience that is equivalent to that outlined in the University of New Hampshire's M.Ed. program in educational administration and supervision. This program offers advanced preparation for those educators who desire careers as school superintendents, assistant superintendents, business managers, state department of education personnel, vocational education coordinators, curriculum coordinators, or educational personnel in private organizations. This program leads to certification as a superintendent in New Hampshire. It is possible to also receive certification as a principal under special circumstances.

The certificate program requires the following (40 credits):

Core requirements (20 credits): C.A.G.S. students may select any five of the following six core courses: 964, Personnel and Communication in Educational Organizations; 968, Collective Bargaining in Public Education; 970, The Change Process in Education; 971, School Facilities Management; 973, Analysis of Educational Policy; and 977, Leadership: The District Level Administrator.

Electives (8 credits): Electives are selected in consultation with the program adviser. A student who does not hold a master's degree in administration may be required to take specific courses as electives.

Concluding experience (12 credits): A student must complete a significant field project and field internship in an appropriate administrative setting.

Counseling

Program information: Angelo Boy, J. Elizabeth Falvey, David Hebert, Dwight Webb

The graduate program in counseling prepares graduates to function as professional counselors in a variety of institutions and agencies dedicated to psychological and educational development. The program is designed to produce professional counselors who are able to integrate theory and practice and provide professional leadership.

The Department of Education offers the degrees of master of arts and master of education. The master of arts and the master of education programs prepare counselors to function in a variety of professional settings.

Master of Arts
The master of arts in counseling program has the following requirements:

Core requirements (48 credits): 920, Counseling Theory and Practice; 921, Psychology of Career and Personal Development; 922, Assessment in Counseling; 923, Group Counseling; 924, Psychological Disorders and Adaptation; 925, Counseling Internship I; 926, Counseling Internship II; 927, Theories of Personality; 928, Family Counseling; 929, Advanced Counseling Internship; 930, Research in Counseling; 931, Clinical Diagnosis and Treatment Planning in Counseling.

Electives (8 credits): Selected in consultation with the student's adviser. Additional coursework in statistics and research methodology is frequently required in order to complete the thesis.

Concluding experience (6 credits): A degree candidate must complete a research thesis.

Master of Education
The master of education in counseling requires the following:

Core requirements (32 credits): 920, Counseling Theory and Practice; 921, Psychology of Career and Personal Development; 922, Assessment in Counseling; 923, Group Counseling; 924, Psychological Disorders and Adaptation; 925, Counseling Internship I; 926, Counseling Internship II; and 933, Psychosocial Development in the Classroom.

Electives (4 credits): Selected in consultation with the student's adviser.

Concluding experience: A degree candidate must successfully complete a comprehensive essay examination.

Early Childhood Education

Program information: John Hornstein

The Department of Education offers the master of education degree in early childhood education and an option in special needs. Certification as an early childhood teacher (K–3) is available.

This program is an advanced course of study designed for teachers, administrators, and other early childhood practitioners who wish to improve their professional competence and broaden their career opportunities. The program emphasizes the acquisition of knowledge and competencies in child development (birth through eight years), learning environments, developmentally appropriate curriculum, developmental and cultural diversity, and professional leadership. The coursework culminates in extensive field-based experience.

Admission requirements: All admitted students are expected to have had at least one course in child development at the upper-division level and at least 200 hours of supervised classroom experience with children from birth through eight years of age, or the equivalent.

Core requirements (30 credits): 941, Diversity and Child Development; 942, Sociocultural Perspectives on Teaching and Learning; 943, Changing Contexts in Early Education; 944, Inclusive Curriculum for Young Children; 948, Leadership and Advocacy in Early Childhood Education; one course selected from the special needs option courses offering (EDUC 860, 947, 951, 952, 955, or 956); and two semesters (6 credits) of internship in EDUC 900B and 901B.

Electives (6 credits): Selected in consultation with the program adviser.

Concluding experience: A degree candidate must successfully complete one of the following: a comprehensive written and oral examination, or a research thesis.

Special Needs Option
In addition to the early childhood core requirements described above, students choosing this option will concentrate on young children who are at risk for, or have, developmental difficulties and special needs. Coursework emphasizes an understanding of the role of the family, community, and social policy in early development and intervention. The program is noncategorical in its approach to assessment and educational planning.

Core requirements (38 credits): Identical to core requirements of early childhood program with addition of 860, Introduction to Young Children with Special Needs; 947, Curriculum for Young Children with Special Needs: Evaluation and Program Design; and 949, Supporting Parents of Students with Special Needs.

Electives (4 credits): Selected in consultation with the program adviser.

Concluding experience: A degree candidate must successfully complete one of the following: a comprehensive written and oral examination or a research thesis.

The above program requirements are subject to modification in order to reflect changes in New Hampshire state certification requirements for general special education.

Reading

Program information: John Carney, Grant Cioffi, Paula Salvio, Ruth Wharton-McDonald

The graduate program in reading prepares reading specialists and teachers to provide instruction and leadership in literacy in a variety of educational contexts. The instructional sequence integrates theory, research, and instructional practice, and incorporates field-based and clinical components. Particular emphasis is placed on the interrelationship of reading and writing. Graduates of the program provide direct instruction in literacy and offer leadership in organizing, managing, and evaluating literacy programs.

The program's requirements are as follows:

Core requirements (24 credits): 907, Foundations of Literarcy Instruction; 908-909, Clinical Diagnosis and Remediation of Reading Difficulties and Disabilities; 910, Reading and Writing Methods in the Middle/Secondary School; 913, Field Practicum; 914, Seminar in Reading Research.

Electives (12 credits): Selected in consultation with the program adviser. A student using the research thesis option as a concluding experience will use the 8 credits for EDUC 899, Master's Thesis.

Concluding experience: A degree candidate will successfully complete one of the following: a written examination or a research thesis.

Special Education

Program information: John Hornstein, Georgia Kerns, Jan A. Nisbet, William Wansart

The special education program prepares highly qualified educators who possess the knowledge, dispositions, and skills necessary to take the lead in establishing effective teaching and learning environments for a diverse population of learners, who are capable of collaborating with classroom teachers as team leaders or consultants, and who utilize these skills within their school communities, and within the profession itself. The program meets current certification requirements in the State of New Hampshire.

Degree Requirements Prerequisites: All candidates are required to complete a course in mathematics teaching methods and a course in reading teaching methods. All candidates who have not already done so are required to complete an introductory course in exceptionality (e.g., 850, Introduction to Exceptionality) and an introductory course in special education methods (e.g., 851, Educating Exceptional Learners) with credits not to be counted toward the M.Ed. degree.

Core requirements (18–24 credits): 900C and 901C, Internship and Seminar/General Special Education; 939, Assessment of Children with Learning Difficulties; 940, Teaching Children with Learning Difficulties; and 949, Supporting Families of Individuals with Exceptionalities.

Specialized courses (8 credits): Selected in consultation with the program adviser from advanced courses in special education, or other related areas as appropriate.

Advanced courses (8 credits): 938, Advanced Seminar in Special Education; 981, Quantitative Inquiry: Methods and Techniques of Educational Research.

Electives (4 credits): Selected in consultation with adviser. Students with no previous teaching certification may be asked to complete additional courses.

Concluding experience: All degree candidates must complete, with a defense, an action research project or a research thesis. The thesis typically involves an additional 6 to 10 credits.

The above program requirements are subject to modification in order to reflect changes in New Hampshire state certification requirements for general special education.

Teacher Education

Program information: Michael Andrew, Ruth Eurenius

The teacher education program prepares teachers who possess the knowledge, disposition, and skills necessary to take the lead in establishing effective teaching and learning environments within their own classrooms, their school communities, and within the profession itself.

The Department of Education offers the master of arts in teaching degree in elementary and secondary education and the master of education degree in elementary and secondary education for those seeking initial teacher licensing. The Master of Education degree in Teacher Leadership is available for experienced teachers.

Applicants to teacher education programs are evaluated on the following criteria: undergraduate academic record, Graduate Record Examination (GRE) general test scores, and letters of recommendation regarding academic ability, motivation, interpersonal skills, and potential for success as a teacher. Those seeking admission to programs leading to teacher licensing should also have a positive recommendation from EDUC 500, Exploring Teaching, or equivalent experience.

In our admissions process, we seek evidence that our students have the following knowledge, abilities, and dispositions: (1) motives to teach that include a strong social commitment to contribute to society through education; (2) a disposition to care for their students—each and every one; (3) an ability to interact positively with children and adults; (4) a capacity to win the respect of their peers and be effective in group interaction, showing openness to the needs and views of others; (5) well-developed communication skills, including speaking, writing, and listening skills as well as an ability to engage others in both the giving and receiving of information and feelings; (6) perceptiveness—the ability to identify and process the relevant details in their environment, especially in the context of a classroom; (7) the ability to make reasonable judgments in a context of complex situations that change from moment to moment; (8) the capacity for clear thinking and an ability to translate their thoughts into simple and clear explanations; (9) superior academic skills, extensive knowledge of at least one major discipline, intellectual curiosity, the ability to be open to the unknown, and the willingness to tolerate uncertainty in the face of enormous pressure to deny it; (10) a disposition to take charge of their own learning, which includes the active pursuit of feedback and the willingness to take thoughtful risks.

Any course taken in the Department of Education that will be used to fulfill a teacher licensure requirement must be completed with a grade of B- or better.

Master of Arts in Teaching and Master of Education Programs for Those Seeking Teacher Licensure

These programs are designed for two types of students: (1) those UNH undergraduates who anticipate completing the Five-Year Teacher Preparation Program at UNH and (2) those who completed an undergraduate degree either at UNH or elsewhere with little or no coursework in education. The programs lead to teaching licensure at the elementary and secondary levels. Admission to these programs is highly competitive.

Licensure requirements that must be met prior to or as part of the master's degree program include completion of 4 credits or an equivalent in each of the following: 500, Exploring Teaching; 800, Educational Structure and Change; 801, Human Development and Learning: Educational Psychology; 803, Alternative Teaching Models; 805, Alternative Perspectives on the Nature of Education; 851A or B, Educating Exceptional Learners; 900A, 901A, Internship and Seminar/Teaching (6 credits each).

Elementary teacher licensure requirements include two additional courses: 806, Introduction to Reading Instruction in the Elementary Schools, or 907, Foundations of Reading Instruction; and a mathematics course: MATH 701, Exploring Mathematics I, MATH 702, Exploring Mathematics II (4 credits each), or the equivalent.

All students recommended for teacher licensure receive academic preparation in working with exceptional children, which is integrated throughout licensure coursework. Those pursuing teacher licensure in art, biology, chemistry, earth sciences, general science, home economics, physical education, physics, or social studies must also complete EDUC 807, Teaching Reading through the Content Areas (2 credits).

Credits earned in the seven-week Live, Learn, and Teach summer program may be applied toward the master's degree. Live, Learn, and Teach satisfies the EDUC 500, Exploring Teaching requirement; 4 credits of EDUC 935, Seminar and Practicum in Teaching; 4 credits of 800A, Educational Structure and Change; and 2 credits of 803H, Experiential Curriculum.

Preparation for licensure in general special education is available to those who complete the M.A.T. or M.Ed. programs in either elementary or secondary education. This licensure allows recipients to serve as general special education teachers. In order to qualify for licensure in general special education, students must complete 22 credits (18 of which may be used toward the M.Ed. degree, or 6 toward the M.A.T. degree); a reading methods course; a mathematics methods course; 850, Introduction to Exceptionality;

Profile

Patrice Hallock

Ph.D. candidate, Education

Doug Prince

"[In my study] I will challenge our understanding of diversity and cultural competence to include social and economic diversity in addition to ethnic diversity."

Some critical questions just kept occurring to Patrice Hallock, an infant and toddler specialist, while she worked as a home visitor for an early intervention program.

Now, as a doctoral student in education, Hallock is engaged in an anthropological field study.

"I'm using field methods and interviewing techniques to understand social and economic difference and to understand the experience of families and the home visiting relationship," says Hallock.

Her research questions include:

- How do families who are socially and economically diverse (i.e., impacted by poverty) perceive infant well-being?
- What is the experience of families who participate in Early Head Start?

Hallock hopes her research will have practical implications for early intervention and home visiting programs and school practice as well.

"This degree program has provided me with enough flexibility to draw from other social science resources yet stay within a solid education framework to pursue my degree," says Hallock. "I have placed a priority on developing the research skills necessary for me to continue my work as a qualitative researcher."

851, Educating Exceptional Learners; 939–940, Assessment and Teaching of Children with Learning Difficulties; 900, 901, Internship and Seminar (6 credits).

Dual licensure in early childhood education and elementary education is available to those who are enrolled in the M.Ed. in Elementary Education. This dual licensure allows recipients to serve as early childhood and/or elementary teachers. The early childhood/elementary education dual certification program option is intended for students who have majored in family studies with an option to child studies or young child/nursery-kindergarten, or the equivalent. Dual licensure requires three graduate courses in early childhood education to be selected in consultation with an adviser from the early childhood program. The three early childhood courses will count as a graduate concentration in the M.Ed. elementary program. Students will complete a full-year internship at the K–3 level under the auspices of the teacher education program.

Master of Arts in Teaching (Elementary and Secondary)

The master of arts in teaching program is most appropriate for students who wish to do a portion of their graduate study outside the Department of Education in their major teaching field or associated fields.

The program has the following requirements:

Core requirements: 800, Educational Structure and Change; 801, Human Development and Learning: Educational Psychology; 803, Alternative Teaching Models (or required methods course); 805, Alternative Perspectives on the Nature of Education; 851A or B, Educating Exceptional Learners; 900A, 901A, Internship and Seminar/Teaching (in addition, for elementary licensure: 806, Introduction to Reading Instruction in the Elementary Schools, or 907, Foundations of Reading Instruction; and one appropriate mathematics course). An additional three full courses (3-4 credits each) outside the Department of Education related to the student's teaching field are selected to form a concentration. Secondary candidates may apply a methods course taken outside the Department of Education to the concentration.

Electives (up to 6 credits): Selected in consultation with the program adviser.

Concluding experience: A degree candidate must successfully complete a teacher education program portfolio and colloquium.

Master of Education (Elementary and Secondary)

This master of education degree is most appropriate for those students who wish to concentrate their graduate study in the Department of Education.

The program has the following requirements:

Core requirements: Core requirements are identical to those for the master of arts in teaching degree. Three full courses (3-4 credits each) within the Department of Education are selected to form a concentration. Elementary education candidates may apply 806 or 907 toward this concentration.

Electives (up to 6 credits): Selected in consultation with the program adviser.

Concluding experience: Concluding experiences are the same as those for the master of arts in teaching degree.

Master of Education in Teacher Leadership

This program is designed to extend the vision of the preservice program to experienced teachers who wish to remain in the classroom but expand their leadership role in improving schooling. Students must complete a minimum of eight 4-credit courses, of which three must be chosen from the curriculum and instruction core. Of the remaining courses, one must come from each of the four support areas. The final course can be chosen in consultation with the program adviser.

Core requirements: 894, Master's Proseminar in Teacher Leadership; 958, Analysis of Teaching; 953, Seminar in Curriculum Study; 894, Proseminar in Teacher Leadership.

Concentration: A set of courses chosen by the student in consultation with their adviser which reflect a personal interest of goal. A concentration consists of 20 credits in or outside education. As part of the concentration, students are required to complete at least one 4-credit research course appropriate to their area of interest.

Concluding experience: A student must successfully complete one of the following: an inquiry project, or a research thesis. Students electing the research thesis must elect six credits of 899 as a part of their concentration.

Courses

800	Educational Structure and Change	2 or 4 cr.
801	Human Development and Learning: Educational Psychology	2 or 4 cr.
803	Alternative Teaching Models	2 or 4 cr.
805	Alternative Teaching Perspectives on the Nature of Education	2 or 4 cr.
806	Introduction to Reading in the Elementary School	4 cr.
807	Teaching Reading through the Content Areas	2 cr.
820	Introduction to Computer Applications for Education	4 cr.
833	Introduction to the Teaching of Writing	4 cr.
834	Children's Literature	4 cr.
835	Young Adult Literaure	4 cr.
841	Exploring Math with Young Children	4 cr.
850	Intro to Exceptionality	4 cr.
851A	Educating Exceptional Learners: Elementary	4 cr.
851B	Educating Exceptional Learners: Secondary	4 cr.
852	Contemporary Issues in Learning Disabilities	4 cr.
853	Contemporary Issues in Behavioral Disabilities	4 cr.
854	Contemporary Issues of Developmental Diabilities	4 cr.
860	Introduction to Young Children with Special Needs	4 cr.
876	Reading for Learners with Special Needs	4 cr.
881	Introduction to Statistics: Inquiry, Analysis, and Decision Making	4 cr.
885	Educational Assessment	4 cr.
891	Methods of Teaching Secondary Science	4 cr.
894	Proseminar in Teacher Leadership	2 cr.
896	Summer Institute in Environmental Education	8 cr.
897	Seminar in Contemporary Educational Problems	1 to 4 cr.
899	Master's Thesis	6 to 10 cr.
900A	Internship and Seminar/Teaching	3 or 6 cr.
900B	Internship and Seminar/Early Childhood Education	3 or 6 cr.
900C	Internship and Seminar/General	3 or 6 cr.
901A	Internship and Seminar/Teaching	3 or 6 cr.
901B	Internship and Seminar/Early Childhood Education	3 or 6 cr.
901C	Internship and Seminar/General	3 or 6 cr.
902	Doctoral Proseminar in Education	4 cr.
903	Normative Inquiry in Education	4 cr.
904	Qualitative Inquiry in Education	4 cr.
905	Critical Inquiry in Education	4 cr.
907	Foundations of Literacy Instruction	4 cr.
908	Clinical Diagnosis and Remediation of Reading Difficulties and Disabilities	4 cr.
909	Clinical Diagnosis and Remediation of Reading Difficulties and Disabilities	4 cr.
910	Reading and Writing Methods in the Middle/Secondary School	4 cr.
913	Field Practicum in Reading	4 cr.
914	Seminar in Reading Research	4 cr.
918A	Seminar on Research in Literacy Instruction	2 cr.
918B	Seminar on Research in Literacy Instruction	2 cr.
918C	Seminar on Research in Literacy Instruction	2 cr.
918D	Seminar on Research in Literacy Instruction	2 cr.
920	Counseling Theory and Practice	4 cr.

921 Psychology of Career and Personal Development 4 cr.
922 Assessment in Counseling 4 cr.
923 Group Counseling 4 cr.
924 Psychological Disorders and Adaptation 4 cr.
925 Counseling Internship I: Professional Orientation and Ethics 4 cr.
926 Counseling Internship II 4 cr.
927 Theories of Personality 4 cr.
928 Family Counseling 4 cr.
929 Advanced Counseling Internship 4 cr.
930 Research in Counseling 4 cr.
931 Clinical Diagnosis and Treatment Planning in Counseling 4 cr.
932 Society and Culture: Contemporary Issues in Counseling 4 cr.
933 Psychosocial Development and Comprehensive Guidance in Schools 4 cr.
935A Seminar and Practicum in Teaching 4 cr.
935B Seminar and Practicum in Teaching 4 cr.
938 Advanced Seminar in Special Education 4 cr.
939 Assessment and Teaching of Children with Learning Difficulties 4 cr.
940 Assessment and Teaching of Children with Learning Difficulties 4 cr.
941 Diversity and Child Development 4 cr.
942 Sociocultural Perspectives on Teaching and Learning 4 cr.
943 Changing Contexts in Early Education 4 cr.
944 Inclusive Curriculum for Young Children 4 cr.
947 Curriculum for Young Children with Special Needs: Evaluation and Program Design 4 cr.
948 Leadership and Advocacy in Early Childhood Education 4 cr.
949 Supporting Families of Individuals with Exceptionalities 4 cr.
950 Research in Culture, Behavior, and Development 4 cr.
951 Laws and Regulations Affecting the Education of Students with Disabilities 4 cr.
953 Seminar in Curriculum Study 4 cr.
957 Collaborative Models of Supervision for Cooperating Teachers 4 cr.
958 Analysis of Teaching 4 cr.
961 Public School Administration 4 cr.
962 Educational Finance and Business Management 4 cr.
964 Personnel and Communication in Educational Organizations 4 cr.
965 Educational Supervision and Evaluation 4 cr.
967 Legal Aspects of School Administration 4 cr.
968 Collective Bargaining in Public Education 4 cr.
969 Practicum in Educational Administration 4 cr.
970 The Change Process in Education 4 cr.
971 School Facilities Management 4 cr.
972 Educational Program Evaluation 4 cr.
973 Analysis of Educational Policy 4 cr.
974 Administrative Internship and Field Project 6 cr.
975 Administrative Internship and Field Project 6 cr.
976 The Principalship 4 cr.
977 Leadership: The District Level Administrator 4 cr.
980 Research in the Teaching of Writing 4 cr.
981 Quantitative Inquiry: Methods and Techniques of Educational Research 4 cr.
982 Issues and Methods in Ethnographic Research in Education 4 cr.
985 Contemporary Issues and Theories in Human Learning and Development 4 cr.
986 Philosophy of Education 4 cr.
988 Alternative Models of Teacher Development 4 cr.
990 Developmental Perspectives on Adulthood 4 cr.
991 Curriculum Theory I 4 cr.
992 Curriculum Theory II 4 cr.
995 Independent Study in Education 1 to 4 cr.
998 Special Topics in Education 1 to 4 cr.
999 Doctoral Research

Electrical and Computer Engineering (EE)

Professors: Kent A. Chamberlin, L. Gordon Kraft, John R. LaCourse, W. Thomas Miller III, Paul J. Nahin, Andrzej Rucinski, Kondagunta Sivaprasad
Adjunct Professors: Robert E. Levin, Stuart M. Selikowitz
Associate Professors: Michael J. Carter, Allen D. Drake, Richard A. Messner
Research Associate Professors: David J. Forrest, William H. Lenharth
Assistant Professor: Andrew L. Kun
Adjunct Assistant Professor: Jennifer T. Bernhard

Degrees Offered

The Department of Electrical and Computer Engineering offers a program of study leading to the master of science degree with a major in electrical engineering. An option in electrical engineering is available within the engineering Ph.D. program.

Opportunities

Advanced degrees in electrical engineering open the door to a wider variety of job opportunities, particularly with regard to consulting, research and development, and positions in academia.

Within the department, opportunities for formal study, research, and individual or team projects are available in the following areas: biomedical engineering; communication systems; digital signal processing; computer engineering, computer networks, digital systems, and logical synthesis; robotics and neural networks; image processing and pattern analysis; control systems; fiber optics; electromagnetics; space systems engineering; rapid prototyping technologies; VLSI circuits; reconfigurable, testable, and fault-tolerant computational structures; ocean engineering; and instrumentation.

Facilities

Specific examples of facilities and opportunities within the department include the Design Automation Laboratory (DAL), which provides CAD design tools. CATLAB is the department's center for the federally funded "CAR-65" project that is integrating state of the art audiovisual computer and communication equipment into state police cruisers. The department also has close alliances with the InterOperability Laboratory (IOL), Space Science Center (SSC), and the Center for Coastal and Ocean Mapping (CCOM), three internationally renowned research laboratories.

For the most current information about specific opportunities, visit: www.ece.unh.edu.

Admission Requirements

An applicant should have completed a baccalaureate degree in electrical engineering or have comparable training, which included courses in mathematics and physical science, network theory, digital systems, fields and waves, electronics, electrical circuits, with appropriate laboratory experiences. Students with a baccalaureate degree from non–U.S. universities must take and submit general scores from the Graduate Record Examination.

M.S. Degree Requirements

Each student meets with a faculty adviser to set up a program of study. No specific course requirements are mandated. Normally, a minimum of 12 credits of 900-level courses is required, not including thesis or project.

The department considers the development of professional communication skills through technical presentations a basic component of a graduate education. Every master's student is required to participate in seminars or course lectures as needed to satisfy the technical presentation requirement.

In addition to taking advanced coursework, master's students must demonstrate their ability to do independent work and report their results. This can be done in either of two ways: (1) a minimum of 24 credits of coursework plus 6 credits of thesis (EE 899), or (2) a minimum of 27 credits of coursework plus a 3-credit, one-semester project (EE 995). With the consent of the graduate committee and approval of the Graduate School, a student who has demonstrated the ability to do independent work through sufficient industrial experience may substitute an approved course for EE 995.

Ph.D. Option Requirements

Following entrance into the doctoral program, a guidance committee is appointed for the student by the Dean of the Gradu-

ate School upon recommendation of the graduate coordinator. This committee assists students in outlining their programs and may specify individual coursework requirements.

To qualify for the Ph.D. in Engineering, the student must successfully pass two separate examinations. The first exam is called the preliminary exam and is normally taken at the completion of the first semester. This exam tests the student's general electrical engineering knowledge at the undergraduate level and the results are used in further coursework decisions. The comprehensive exam is normally given at the completion of all course work and primarily involves the development and presentation of a research proposal to the guidance committee.

Typically, 24 credits of course work beyond the M.S. are expected. A minimum cululative grade point average of 3.33 must be maintained. Upon the successful completion of all course work and the comprehensive examination, the student is advanced to candidacy and, upon the recommendation of the graduate coordinator, a doctoral committee is appointed by the dean of the Graduate School. The doctoral committee conducts an annual review of the student's progress, supervises and approves the doctoral dissertation, and administers the final dissertation defense.

Courses

Permission of instructor is required for enrollment in all electrical and computer engineering courses taken for graduate credit.

804	Electromagnetic Fields and Waves II	4 cr.
807	Computer Engineering	4 cr.
811	Digital Systems	4 cr.
814	Introduction to Digital Signal Processing	4 cr.
815	Introduction to VLSI	3 or 4 cr.
817	Introduction to Digital Image Processing	4 cr.
841	Nonlinear Systems Modeling	4 cr.
845	Fundamentals of Acoustics	4 cr.
857	Fundamentals of Communication Systems	4 cr.
858	Communication Systems	4 cr.
860	Introduction to Fiber Optics	4 cr.
872	Control Systems	4 cr.
875	Applications of Integrated Curcuits	4 cr.
877	Collaborative Engineering I	2 cr.
878	Collaborative Engineering II	2 cr.
884	Biomedical Instrumentation	4 cr.
896	Special Topics in Electrical Engineering	1 to 4 cr.
899	Master's Thesis	6 cr.
901	Electromagnetic Field Theory	3 cr.
939	Statistical Theory of Communications	3 cr.
940	Information Theory	3 cr.
941	Digital Signal Processing	3 cr.
944	Nonlinear Control Systems	4 cr.
951	Advanced Control Systems I	3 cr.
952	Advanced Control Systems II	3 cr.
955	Estimation and Filtering	3 cr.
960	Computer Architecture	3 cr.
965	Introduction to Pattern Recognition	3 cr.
970	Introduction to Optical Signal Processing	3 cr.
980	Opto-Electronics	3 cr.
992	Advanced Topics in Electrical Engineering	3 cr.
993	Advanced Topics in Computer Engineering	1 to 4 cr.
994	Advanced Topics in Systems Engineering	3 cr.
995	Master's Project	3 cr.
998	Independent Study	1 to 3 cr.
999	Doctoral Research	

Engineering Ph.D. Program (ENGR)

Degree Offered

The College of Engineering and Physical Sciences offers a program of study leading to the degree of doctor of philosophy in engineering. The program has seven options: chemical engineering, civil engineering, electrical engineering, materials science, mechanical engineering, ocean engineering, and systems design.

Option in Systems Design

Barry K. Fussell, area coordinator

The systems design option is an interdepartmental program that addresses contemporary engineering and scientific problems that can be solved only through the cooperation of a variety of disciplines. Students in systems design can elect either one of two professional directions. The first develops professionals with the technical expertise of a Ph.D. and with the ability to work with and direct groups of people working on large-scale technical projects. The second direction develops engineers with capabilities in the theory and analysis of large-scale complex systems. Concentration in an area of specific individual interest is combined with participation in a larger interdisciplinary project.

Admission Requirements

Qualified students with bachelor's or master's degrees in engineering, mathematics, or the physical sciences are eligible for admission to the program. To be admitted, students must present evidence that they have sufficient background in the area in which they propose to specialize. They must also find a CEPS faculty member to serve as their adviser.

Ph.D. Option Requirements

Following entrance into the program, a guidance committee is appointed for the student by the dean of the Graduate School upon recommendation of the student's area coordinator. This committee assists students in outlining their program and may specify individual coursework requirements in addition to those required by the area of specialization. The committee also conducts an annual in-depth review of each student's progress and, following substantial completion of a student's coursework, administers the qualifying examination. This committee is also responsible for administering the language examination and/or research-tool proficiency requirements. Coursework and language requirements should normally be completed by the end of the second year of full-time graduate study and must be completed before the student can be advanced to candidacy.

Upon the successful completion of the qualifying examination and other proficiency requirements, the student is advanced to candidacy and, upon the recommendation of the student's area coordinator, a doctoral committee is appointed by the dean of the Graduate School. The doctoral committee conducts an annual review of the student's progress, supervises and approves the doctoral dissertation, and administers the final dissertation defense.

To obtain a Ph.D. degree in engineering, a student must meet all of the general requirements as stated under academic regulations and degree requirements of the Graduate School. Students are normally expected to take coursework equivalent to two full-time academic years beyond the baccalaureate and to complete a dissertation on original research that will require at least one additional year of full-time study. A student should consult specific course offerings and descriptions of each department and should consult the area coordinator for additional information.

999 Doctoral Research

English (ENGL)

Professors: Janet Aikins, Elizabeth Jane Bellamy, Thomas A. Carnicelli, Mary Morris Clark, Michael V. DePorte, Walter F. Eggers, Burt H. Feintuch, Michael K. Ferber, Lester A. Fisher, Elizabeth H. Hageman, Jane T. Harrigan, Rochelle Lieber, Mekeel McBride, Andrew H. Merton, Thomas R. Newkirk, Susan Schibanoff, Charles D. Simic, David H. Watters
Associate Professors: John M. Archer, Brigitte Gabcke Bailey, Margaret-Love G. Denman, John Richard Ernest, Diane P. Freedman, Cinthia Gannett, Susan Margaret Hertz, Romana C. Huk, James Krasner, Douglas M. Lanier, John S. Lofty, Lisa Watt MacFarlane, Lisa C. Miller, Sarah Way Sherman, Sandhya Shetty, Patricia A. Sullivan, Rachel Trubowitz
Assistant Professors: Charlotte M. Bacon, Monica E. Chiu, Robin Hackett, Peter J. Mascuch, Aya Matsuda, Paul Kei Matsuda, Naomi G. Nagy, Petar Ramadanovic, Siobhan Senier

Degrees Offered

The Department of English offers three advanced degrees: master of arts with options in literature, English language and linguistics, and writing; master of science for teachers; and doctor of philosophy.

Admission Requirements

All applicants must submit writing samples in accordance with guidelines available from the English department graduate office. All applicants (except those in M.S.T.) are also required to submit Graduate Record Examination scores for the general test. Applicants for the doctor of philosophy degree program in literature must also submit scores for the subject test of literature in English. A student admitted to the Ph.D. program must hold an M.A. degree or be in the final stage of completing requirements for the degree.

Applicants for the degree of master of science for teachers should consult the general regulations of the Graduate School for special admission requirements.

All applicants who wish to be considered for teaching assistantships or tuition scholarships must complete an application form, available from the English department graduate office.

Master of Arts Degree Requirements

Literature Option

An M.A. candidate must complete 32 credit hours at the 800 or 900 level including two seminar courses and either a third seminar in literature or ENGL 998 (Master's Paper). At least five courses must be literature courses offered by the English department (as distinct from courses in critical theory, linguistics, writing, or teach methods). If a student chooses the Master's Paper option, this requirement is reduced to four literature courses. Each M.A. candidate must also pass ENGL 925 (The Graduate Study of Literature), one course in the English language or the teaching of composition, and one course in literacy theory. The literary theory requirement would normally be met by successful completion of ENGL 812, 813, 814, or 926. As a general rule, all courses counting toward the M.A. degree should be taken in the English department, and no more than two literature courses should be taken in a combined 700/800 (split) level course. In special circumstances, however, a student may be allowed to apply toward the degree up to two graduate courses offered by other departments.

M.A. candidates must pass a reading examination in a foreign language or demonstrate that they have passed a fourth-semester college-level language course with a grade of B or better. Students whose native language is not English may be exempt from this requirement.

Writing Option

The master of arts in writing is designed for students who intend to become professional writers. Eight working writers supervise the program. Students must elect to specialize in fiction, nonfiction, or poetry. Each member of the writing faculty is accomplished in at least one of these fields.

The writers at UNH emphasize conference teaching. Each student meets frequently with writers specializing in the student's area of study. In addition, each student works closely with a writer-adviser throughout the program.

Workshop courses provide forums for prompt, detailed criticism of each student's writing by instructors and fellow students. Each student takes at least two workshops in his or her specialty and may elect to take an additional workshop in another area as well. Form-and-theory courses and literature courses complete the program. The program consists of 32 credit hours at the 800 or 900 level.

Upon completion of the required courses, the student submits a portfolio of writing to the staff. The portfolio might consist of short stories, a novel, nonfiction articles, a nonfiction book, or a collection of poetry. The degree is awarded upon approval of the portfolio by a committee of writers. There is no foreign language requirement.

English Language and Linguistics Option

Students who wish to specialize in any of the various areas of English language and linguistics may design an M.A. program to meet their interests. Specialties include applied linguistics and the teaching of English as a second language as well as the traditional subfields of linguistics. Psycholinguistics courses are offered through the psychology department.

To earn the M.A. degree, students must complete at least 32 credit hours at the 800 or 900 level, including one seminar course, and 4 credits of ENGL 998, in which they are to produce a substantial scholarly paper. Unless the student already has a strong background in linguistic theory, the program of study must include one course in phonetics and phonology (ENGL 893) and one in syntax and semantics (ENGL 894). Reading knowledge of one foreign language is required. This may be demonstrated by passing a departmental examination or by receiving a grade of B or better in a fourth-semester college-level language course. Students whose native language is not English may be exempt from this requirement. The student's course of study must be approved by the program adviser.

Master of Science for Teachers Degree Requirements

The master of science for teachers is designed for high school teachers. No foreign language is required. The student must complete 32 credit hours at the 800 or 900 level. At least 24 of these credits must be in the Department of English. Courses taken outside the department must be approved by the student's adviser.

Ph.D. Degree Requirements

The Ph.D. program combines the essential guidance and discipline of course work with the equally essential freedom of independent study and research. To be admitted to the doctoral program a student must hold an M.A. degree. Students choose between two areas, literature and composition studies. Students choosing either area or program must demonstrate basic profi-

ciency in two languages or advanced proficiency in one. Basic proficiency may be demonstrated by passing a departmental examination or by receiving a grade of B or better in a fourth-semester college-level language course. Advanced proficiency may be demonstrated by advanced coursework or by passing a rigorous departmental examination.

The doctoral program in literature is designed to train students to be teachers and scholars in the fields of literature and language. Students in this program will complete eleven graduate courses of which four must be seminars. The other courses must be at the 800 or 900 level and must include the Practicum in Teaching College Composition (ENGL 910), the Seminar in Literary Theory (ENGL 926), and the ungraded two-credit course in Bibliography and Professional Practices (ENGL 924). Students must in addition pass a general examination in English and American literature, a more specialized qualifying examination, and the final oral defense of their dissertation.

The program in composition studies is designed to train experts in the teaching of composition who are also qualified to teach general courses in literature or linguistics. Students in composition studies will complete ten graduate-level courses of which four must be seminars. The other courses must be at the 800 or 900 level and will include a Practicum in Teaching College Composition (ENGL 910) and Research Methods in Composition (ENGL 918). Students will take a combined general and qualifying examination that focuses both on the theory of composition and rhetoric, and on a secondary area of specialization. Their dissertation work will be on a topic in composition.

Ph.D. student normally hold assistantships and teach under supervision; such teaching is considered a vital part of the student's professional training.

Courses

803	Advanced Nonfiction Writing	4 cr.
804	Advanced Nonfiction Writing	4 cr.
805	Advanced Poetry Workshop	4 cr.
807	Form and Theory of Fiction	4 cr.
808	Form and Theory of Nonfiction	4 cr.
809	Form and Theory of Poetry	4 cr.
810	Teaching Writing	2 to 6 cr.
811	Editing	4 cr.
813	Literary Theory	4 cr.
814	Literary Theory	4 cr.
815	TESL: Theory and Methods	4 cr.
816	Curriculum Design, Materials, and Testing in English as a Second Language	4 cr.
819	Sociolinguistics Survey	4 cr.
832	Folklore and Folklife	4 cr.
842	American Literature, 1815-1865	4 cr.
843	American Literature, 1865-1915	4 cr.
844	American Literature, 1915-1945	4 cr.
845	Contemporary American Literature	4 cr.
849	Major American Authors	4 cr.
850	Special Studies in American Literature	4 cr.
851	Medieval Epic and Romance	4 cr.
852	History of the English Language	4 cr.
853	Old English	4 cr.
858	Shakespeare	4 cr.
864	Prose and Poetry of the Elizabethans	4 cr.
868	Literature Later 18th Century	4 cr.
871	Victorian Prose and Poetry	4 cr.
873	British Literature of the 20th Century	4 cr.
874	British Literature of the 20th Century	4 cr.
875	Irish Literature	4 cr.
879	Linguistic Field Methods	4 cr.
880	English Drama to 1640	4 cr.
883	The English Novel of the 18th Century	4 cr.
884	The English Novel of the 19th Century	4 cr.
886	Twentieth-Century British Fiction	4 cr.
890	Special Topics in Linguistics	4 cr.
891	English Grammar	4 cr.
892	Teaching Secondary School English	4 cr.
893	Phonetics and Phonology	4 cr.
894	Syntax and Semantic Theory	4 cr.
897	Special Studies in Literature	2 to 6 cr.
901	Advanced Writing of Fiction	4 cr.
910	Practicum in Teaching College Composition	4 cr.
911	Writing for Teachers	4 cr.
912	Historical and Theoretical Studies in Rhetoric	4 cr.
914	Special Topics in Composition and Rhetoric	2 to 6 cr.
916	History of Composition	4 cr.
918	Research Methods in Composition	4 cr.
919	Teaching the Writing Process	2 to 6 cr.
920	Issues in Teaching English and the Language Arts	1 to 6 cr.
921	Practicum in Teaching English and the Language Arts	2 to 6 cr.
923	Advanced Essay Writing	4 cr.
924	Bibliography and Methods	2 cr.
925	Graduate Study of Literature	4 cr.
926	Seminar—Literary Theory	4 cr.
927	Seminar—Feminist Criticism Theory and Practice	4 cr.
935	Seminar—Studies in American Literature	4 cr.
936	Seminar—Literature of Early America	4 cr.
937	Seminar—Studies in 19th-Century American Literature	4 cr.
953	Seminar—Studies in Old English	4 cr.
958	Seminar—Studies in Shakespeare	4 cr.
959	Seminar—Studies in Milton	4 cr.
964	Seminar—Studies in 16th-Century Literature	4 cr.
968	Seminar—Studies in 18th-Century Literature	4 cr.
970	Seminar—Studies in the Romantic Period	4 cr.
974	Seminar—Studies in 20th-Century British Literature	4 cr.
994	Practicum in Teaching English to Speakers of Other Languages	2 to 6 cr.
995	Independent Study	1 to 8 cr.
996	Reading and Research	2 to 8 cr.
998	Master's Paper	4 cr.
999	Doctoral Research	

Environmental Education

Professors: Robert T. Eckert, Natural Resources; Barrett N. Rock, Natural Resources
Associate Professors: Eleanor D. Abrams, Education; Mimi Larsen Becker, Natural Resources; Joseph J. Onosko, Education
Research Associate Professor: David M. Burdick, Natural Resources
Assistant Professors: Elizabeth A. Finkel, Education; E. Scott Fletcher, Education

Degree Offered

The program offers a master of arts degree with a major in environmental education. The Master of Arts in Environmental Education is an innovative and collaborative effort of the Department of Education and the Department of Natural Resources. The program is dedicated to preparing educators who can help students develop the interdisciplinary knowledge, skills of inquiry, and participatory dispositions that are necessary to address the important environmental questions confronting the world today. In preparing educators for these positions, and to enhance the abilities of professionals currently employed in the field, the M.A. program in environmental education has flexible requirements and gives students the opportunity to work closely with an advisor to create an individualized course of study that meets their interests, reflects their prior experiences, and focuses on their professional goals.

Admission Requirements

Applicants to the M.A. program in environmental education are required to possess a baccalaureate degree from an approved institution and to have successfully completed a minimum of five life science or physical science courses at the undergraduate or graduate level. Applicants are required to submit the following materials for consideration: official trranscripts from all relevant educational institutions; an essay outlining relevant interests, prior experience, and educational goals; and three letters of recommendation from individuals who possess detailed knowledge of the applicant's ability to engage in graduate study. Documentation of other experiences or abilities as an educator is also welcome. Admissions decisions are made on a rolling basis by the Executive Committee of the program. The Graduate Record Exam (GRE) is optional. Promising students who fail to meet one or more of the preceding criteria may be admitted provisionally, with a plan appropriate to their specific needs.

The UNH Marine Program supports research, education, and service projects involving the estuarine, coastal, and deep ocean environments.

Graduate students Jennifer Wanat, Daniel O'Grady, Glenn Rice, and Professor Win Watson haul a lobster trap video camera from the waters of Portsmouth Harbor near the Coastal Marine Lab in New Castle.

Daniel O'Grady

M.S. student, Zoology

The coastal life and research seem to fit Dan O'Grady just right. He grew up near Boston and spent his summers in Falmouth near Wood's Hole. "My thesis is on lobster behavior and physiology," he says. "I'm trying to figure out how lobsters respond to reductions in water salinity and how that affects the physiology of the lobster."

For most of his research O'Grady brings lobsters to a laboratory. He runs experiments at three different UNH labs: the Jackson Estuarine Lab at Adam's Point in Durham, the Coastal Marine Lab in New Castle, and on campus at the lab in Rudman Hall.

Jennifer Wanat

M.S. student, Zoology

She started out as a competitive swimmer, took scuba diving classes, and then did some diving for Professor Win Watson and for the open ocean aquaculture project.

"My area of interest is fisheries biology, specifically, the winter flounder and its juvenile habitat within the Great Bay estuary," says Jennifer Wanat '99, who earned her B.S. in marine biology. "They're a marine species, but they utilize estuaries for spawning and the first few years of their life."

Wanat takes samples once a month at eight sites."One of the advantages of doing research in Great Bay," says Wanat, "is that it's one of the largest estuaries on the East Coast and one of the most studied."

Lobster photo: Kalle Matso, CICEET; all others: Frank Carlson

M.A. Requirements

The M.A. program in environmental education helps prepare educators who are able to integrate and put into practice the three focus areas that constitute the program's academic core:

Curriculum and Pedagogy: an understanding of teaching as a critical, self-reflective, and inquiry-based activity, collaboratively undertaken in diverse communities.

Environmental Science: an understanding of the physical and biological processes and relationships that constitute ecosystems.

Human Patterns and Environmental Transformations: an understanding of the social (e.g., economic, political, institutional) and ethical dimensions of environmental policy.

The program requires 32 credits for graduation and is organized in three parts:

The Summer Institute (8 credits): Students enter the program by enrolling in an intensive Summer Institute that is coordinated and taught by an interdisciplinary team of of UNH faculty. The curriculum involves a case study approach, integrating the three focus areas in an experiential setting. This experience gives students a foundation for creating a rigorous, coherent, and challenging program of study, which they begin (on a part- or full-time basis) during the following year.

Individualized Program of Study (20 credits): The three focus areas of the program provide the structure within which students pursue and integrate the courses that make up their individualized program of study. With the guidance of an adviser, students select a group of courses that balances depth and breadth. All individualized programs of study are approved by the program's executive committee.

Practicum (4 credits): The field-based Practicum is taken as the final course in the program. Students work in an internship site demonstrating their ability to put into practice a thoughtful and effective vision of environmental education. In the seminar that accompanies the internship, students create and present a portfolio that reflects what they have achieved in the program. Completion of the program portfolio marks the, fulfillment of the requirements for the master's degree.

Family Studies (FS)

Associate Professors: Kristine M. Baber, Elizabeth M. Dolan, Barbara R. Frankel, Larry J. Hansen, Michael F. Kalinowski, Kerry Kazura, Victor R. Messier
Assistant Professor: Corinna Jenkins Tucker

Mission Statement

The department's mission is to support the well-being of individuals and families through research, teaching, and service. Programs emphasize both theoretical and practical knowledge about lifespan development, the social and economic roles of families, child advocacy, teacher and parent education, and intervention programs that support families. The department is committed to acknowledging and supporting diversity, providing an educational environment that stresses excellence and innovation, and developing exemplary programs to serve both students and the larger community.

Degree Offered

The Department of Family Studies offers two programs of study leading to a master of science degree in family studies. The thesis program is designed to develop general competence in understanding and applying theory and research regarding child and family issues. The marriage and family therapy option is a clinical program that prepares students to work with families in a clinical setting. The goal of both programs is to provide students with an understanding of theory and methods relevant to child and family studies and to prepare them to work with families in therapeutic, educational, and other community and corporate settings. The clinical program requires a minimum of two years of full-time study, including two summers. Alternative plans of study may be possible.

Admission Requirements

Students in good academic standing with undergraduate degrees in any related field are encouraged to apply. If a student's undergraduate program does not include an introductory statistics course or the equivalent, successful completion of such a course is required before beginning graduate work. Students seeking admission must submit recent scores from the Graduate Record Examination general test. Additional admissions information and personal interviews are required of applicants for the marriage and family therapy option. Information should be obtained by contacting the department's graduate coordinator.

M.S. Specializations

Adolescent Development in Context–Families, Schools, Communities: This specialization is designed to develop general competence in understanding and applying theory and research regarding adolescents within the context of their families and communities. Students are expected to participate in a research project involving adolescents and their families and to complete a practicum in a program serving adolescents.

Child Advocacy: This specialization is designed to develop general competence in understanding theory and research regarding child and family issues with a focus on child advocacy. Students are expected to work with selected agencies as child advocacy interns, develop expertise on at least one advocacy issue, and conduct research on an advocacy related topic.

Poverty and Welfare Policy: This specialization is designed to develop general competence in understanding and applying theory and research regarding family issues related to poverty status and changes in welfare policy, particularly those of New Hampshire. Students are expected to participate in the Rural Family Well-Being Study. This is a longitudinal investigation focusing on limited resource families living in two different rural areas of the state. The purpose of the study is to gain an understanding of the issues and concerns facing rural families in the context of welfare reform, and in the context of their specific communities.

Families at Risk Due to Incarceration: This specialization is designed to develop general competence in understanding and applying theory and research regarding child and family issues with a focus on families at risk. Students are expected to participate in the Family Connection Project. This project is a comprehensive intervention program to support families with incarcerated members, and an extensive evaluation and research study examining the effects of incarceration on family members. Students will gain knowledge in the field through the integration of theory, research, clinical and educational services, and public policy considerations.

Marriage and Family Therapy Option

The M.F.T. option is fully accredited by the Commission on Accreditation for Marriage and Family Therapy Education (AAMFT) and meets the academic require-

ments for clinical membership in the American Association for Marriage and Family Therapy.

This option specifically prepares students to work in mental health, family service, medical and human service settings. The emphasis is on structural, strategic, and systemic approaches to marriage and family therapy. Clinical training is provided under the direction of an approved supervisor of the American Association for Marriage and Family Therapy in the department's Marriage and Family Therapy Clinic. The clinical training emphasizes treating the individual, couple, and family in relationship to the larger systems that influence them. Supervised practica continue throughout the program. AAMFT standards require 500 hours of clinical practice during the program. Additional hours of clinical practice under supervision will be required to meet AAMFT standards for clinical membership after graduation.

Degree Requirements

Specializations

Requirements include (1) completion of the 12-credit core curriculum that includes 991, Professional Issues for Family Specialists; 993, Theoretical Approaches to Family Studies; 994, Research Seminar; (2) 22 additional semester hours of coursework including 4 semester hours of Practicum (807) and an advanced statistics course; and (3) successful completion of a research thesis (6-10 credits in 899) or a comprehensive written examination.

M.F.T. Option

Program requirements include (1) the 12-credit core curriculum (described above); (2) 32 additional semester hours of coursework including 841, Marital and Family Therapy; 846, Human Sexuality; 897, Special Problems (1 credit each in: sexual problems, gender, larger systems, and children in marriage and family therapy);942, Advanced Systems of Marital and Family Therapy; 945 Family Therapy Practice I; 946, Critical Problems in Family Life; 974, Family Therapy Practice II; and (3) successful completion of at least 10 credits of 898 (500 clinical hours of clinical practice) and an integrative paper and presentation.

Resources

Child Study and Development Center (CSDC)

The Child Study and Development Center is a laboratory school affiliated with the Department of Family Studies. The center is supported by its tuition revenues and by University funds. The center operates four programs: (1) an infant-toddler program, (2) a preschool program, (3) a kindergarten program, and (4) a nursery school program. The curriculum is designed to offer developmentally appropriate programs that promote children's development and support families.

Marriage and Family Therapy Center

The Marriage and Family Therapy Center provides assistance to individuals, couples and families experiencing a wide range of personal or relationship problems. The program is committed to a treatment approach within the context of family and community relationships. The program embraces a cross-cultural approach in support of the worth, dignity, potential, and uniqueness of each individual. Students are exposed to clients who present a wide range of clinical problems. The program assists, on average, more than one hundred families each year.

Off-Campus Resources

Family Connection Project: Laconia State Prison

The correctional facility houses a state-of-the-art rehabilitation program established in 1993. The facility houses minimum/medium security offenders who have committed nonviolent crimes that are often associated with drugs and/or alcohol use. This facility offers inmates two sequential programs: (1) a therapeutic community to deal with inmates' substance abuse, and (2) a vocational college program to assist the inmates in their education and employment needs. In 1998 the Department of Family Studies and UNH Cooperative Extension partnered with NH Department of Corrections to develop The Family Connection Project. Programming objectives are to strengthen at-risk families and support the healthy development of children with incarcerated parents. The acquisition of positive family and relationship skills is expected to help reduce the rate of recidivism of incarcerated parents, and improve the parenting abilities of these families.

Contact Information

The department is housed in 218 Pettee Hall. The mailing address is: Department of Family Studies, University of New Hampshire, 55 College Road, Durham, NH 03824-3599. Telephone number: (603) 862-2146. Web site address: www.unh.edu/family-studies/graduate.html.

Courses

807	Practicum	1 to 6 cr.
808	Child and Family Center Internship	1 to 6 cr.
809	Child Study and Development Center Internship	1 to 6 cr.
833	Supervising Programs for Young Children	4 cr.
834	Curriculum for Young Children	4 cr.
841	Marital & Family Therapy	4 cr.
843	Families, Schools, and Community	4 cr.
846	Human Sexuality	4 cr.
857	Race, Class, Gender, and Families	4 cr.
860	Family Programs and Policies	4 cr.
872	International Approaches to Child Advocacy	4 cr.
873	International Perspectives on Children and Families	4 cr.
888	Student Teaching Young Children	8 cr.
894	Families and the Law	4 cr.
897	Special Topics	1 to 4 cr.
898	Marriage and Family Therapy Practicum	1 to 4 cr.
899	Master's Thesis	6 to 10 cr.
911	Graduate Specialization Internships	2 to 6 cr.
942	Advanced Systems of Marital and Family Therapy	4 cr.
945	Family Therapy Practice I	4 cr.
946	Critical Problems in Family Life	4 cr.
947	Family Therapy Practice II	4 cr.
991	Professional Issues for Family Specialists	4 cr.
993	Theoretical Approaches to Family Studies	4 cr.
994	Research Seminar	4 cr.
995	Seminar and Special Problems	2 to 4 cr.
997	Advanced Research Seminar	4 cr.

Genetics Program (GEN)

Professors: Ann C. Bucklin, Clyde L. Denis, Thomas P. Fairchild, Thomas D. Kocher, J. Brent Loy, Subhash C. Minocha, Robert L. Taylor, Jr., Robert M. Zsigray
Associate Professors: John J. Collins, Thomas M. Davis, Anita S. Klein, Louis S. Tisa
Research Associate Professor: William A. Gilbert
Assistant Professors: Estelle M. Hrabak, G. Eric Schaller

Degrees Offered

The interdepartmental genetics program offers graduate work leading to the degrees of master of science and doctor of philosophy.

The program is conducted by faculty members from animal sciences, biochemistry and molecular biology, microbiology, plant biology, and zoology.

Admission Requirements

Qualified applicants are admitted with the approval of the genetics faculty. Undergraduate preparation should include mathematics through calculus, chemistry through organic, physics, animal or plant biology courses and laboratories, genetics laboratory experience, and preparation in

Profile

Elizabeth "Martie" Majoros

M.A. student, English: Writing

Why would a 20-year professional, who has been both a teacher and a program administrator-coordinator, decide to become a commuter student and go back to graduate school in writing? According to Martie Majoros, the decision was a natural one.

"While I was working in adult literacy, I would think about what it was like not to read, how it affected your life," she explains. "I wanted to tell the stories of these people, and I wanted to be with other writers. I decided, 'if not now, when?'"

Majoros started in fiction, then switched to nonfiction—and has found the flexibility of the program permits her to write both. "Ideas for my characters come from adult literacy students and rural New England people," she says.

The English department has supported her work by awarding her the Elizabeth Jones Scholarship, and it has provided the community she hoped to find. "I like the workshops and feedback," says Majoros. "And the out-of-class time too, the friendships and support."

Lisa Nugent

"I knew that working in a sawmill was a common job for people who were unskilled, and I wanted to follow this individual to see what his day was like."

statistics and computer science are desirable. The general and subject (biology or biochemistry, cell, and molecular biology) tests of the Graduate Record Examination are required.

M.S. Degree Requirements

The program for the master of science degree is formulated by the student with the approval of the guidance committee. Master's students are required to take a minimum of 30 credits, including a core of at least three genetics courses, for a minimum of 10 credits (seminars and thesis excluded). Candidates for the degree will be required to complete a thesis and pass an oral examination covering graduate courses and thesis.

Ph.D. Degree Requirements

The chairperson of the genetics program, with the concurrence of the chairperson of the department of major interest, nominates the student's guidance and doctoral committees, which administer the qualifying and final examinations. Specific course requirements are developed by the student and the guidance committee. Doctoral students are expected to have a broad exposure to genetics courses, exceeding that required of master's students. Students must complete a dissertation on original research in genetics.

The guidance committee for each graduate student determines whether a foreign language will be required.

Teaching Experience

All students are required to participate in a one-year directed teaching experience and are required to attend genetics seminars.

Courses

802	Genetics Lab	4 cr.
804	Genetics of Prokaryotic Microbes	4 cr.
805	Population Genetics	4 cr.
806	Human Genetics	3 cr.
811	Genetics of Eukaryotic Microbes	4 cr.
815	Molecular Evolution	4 cr.
823	Quantitative Genetics	4 cr.
853	Cytogenetics	4 cr.
854	Laboratory in Biochemistry and Molecular Biology of Nucleic Acids	5 cr.
871	Molecular Genetics	4 cr.
874	Plant Biotechnology and Genetic Engineering	3 cr.
875	Plant Biotechnology and Genetic Engineering Lab	2 cr.
882	Developmental Genetics	3 cr.
899	Master's Thesis	6 to 10 cr.
942	Biochemical Regulatory Mechanisms	3 cr.
991	Advanced Topics in Molecular Genetics	3 cr.
992	Advanced Topics in Molecular Biology	3 cr.
995	Special Topics	2 to 4 cr.
996	Special Topics in Genetics	2 to 4 cr.
998	Genetics Seminar	1 cr.
999	Doctoral Research	

Health Administration (HMP)

Professors: James F. McCarthy, David A. Pearson, Jeffrey Colman Salloway, John W. Seavey, Lee F. Seidel, Robert S. Woodward
Associate Professors: Marc D. Hiller, James B. Lewis
Research Associate Professor: Michelle R. Solloway

The Department of Health Management and Policy offers courses in the Health management option of the part-time M.B.A. degree program. These courses are designed to enable students to improve their effectiveness and performance in the management of health care organizations, services, programs, and policies.

Courses

810	Financial Management for Clinicians	3 cr.
900	Health Care in the United States	3 cr.
901	Health Economics	3 cr.
903	Health Care Planning	3 cr.
904	Health Policy	3 cr.
907	Managed Health Care	3 cr.
908	Health Care Quality Assurance and Assessment	3 cr.
910	Epidemiology	3 cr.
911	Statistics in Health Care Management	3 cr.
912	Quantitative Methods in Health Care Management	3 cr.
920	Organization Theory in Health Care	3 cr.
921	Managing Health Services	3 cr.
923	Health Services Marketing	3 cr.
924	Human Resources Management in Health Care	3 cr.
926	Health Care Management Information Systems	3 cr.
930	Managerial Accounting for Health Care Organizations	3 cr.
931	Health Care Finance	3 cr.
940	Legal Strategies in Health Care	3 cr.
950	Ethics and Health Care	3 cr.
960	Advanced Topics in Health Management and Policy	1 to 3 cr.
960A	Health Care Systems	3 cr.
960B	Principles of Epidemiology	3 cr.
960C	Introduction to Environmental Health	3 cr.
960D	Biostatistics	3 cr.
975	The Praxis	1 to 3 cr.
995	Independent Study	1 to 3 cr.
998	Strategic Management of Health Care	3 cr.

History (HIST)

Professors: Jeffry M. Diefendorf, Cathy A. Frierson, Jan V. Golinski, J. William Harris, Francis D. McCann, Jr., Robert M. Mennel, Janet L. Polasky, Harvard Sitkoff, Douglas L. Wheeler
Adjunct Professors: Stephen H. Hardy, Laurel Ulrich, William R. Woodward
Associate Professors: Funso Afolayan, W. Jeffrey Bolster, Kurk Dorsey, Ellen Fitzpatrick, David Frankfurter, Eliga H. Gould, Gregory McMahon, Lucy E. Salyer, Marc L. Schwarz
Assistant Professors: Nicoletta F. Gullace, Yan Lu, Julia E. Rodriguez, Jennifer D. Selwyn, Cynthia J. Van Zandt, Ethel Sara Wolper

Because of its location in the center of New England and with a close working relationship between faculty and students, the University provides an especially appealing environment for the study of history. The style of the department is informal, with ample time for each student to develop individual interests under the direction of faculty advisers. Students are encouraged to refine their own research and education within the scope of faculty expertise. A number of our graduate students have published papers in both regional and national journals, including the *Journal of American History* and the *William and Mary Quarterly*. Several have gained practical experience working in museums such as Strawberry Banke in nearby Portsmouth, in historic preservation projects, historical societies, and archives.

The history department has attracted a nationally recognized faculty with a special concentration in American history. The department has special research and teaching expertise in Atlantic history, social and intellectual history, maritime and environmental history, the history of race and ethnicity, and the history of religion.

The department offers the master of arts and doctor of philosophy degrees. It also offers a master's degree with an option in museum studies. The program has remained small by design in order to maintain the highest possible quality and to allow students to tailor their studies to fit their own intellectual and professional goals. The Ph.D. is granted with concentrations in American history. Available fields for the M.A. and subfields for the Ph.D. are determined by areas of expertise among the members of the faculty.

Degrees Offered

The Department of History offers the master of arts and doctor of philosophy degrees. The master of arts is offered in many fields. A formal option in Museum Studies is available. Doctoral dissertations may be written on the history of the United States or on topics comparing the United States with other societies or areas.

Admission Requirements

The department usually requires evidence of substantial preparation in history at the undergraduate level, together with some preparation in other areas of humanities and social sciences.

Applicants for admission to any graduate program in history should have a minimum of a B average in history, allied humanities, and social sciences. In addition, applicants must submit general test scores from the Graduate Record Examination. The department assesses the student's entire application, including letters of recommendation, in making its decision on admission. Deficiencies in an undergraduate program may be rectified by coursework as a special student, but such coursework cannot be used to satisfy requirements for an advanced degree. The department also recommends that a beginning graduate student have some training in a foreign language. Students in seminar or reading courses in other than American history may be required to have a reading knowledge of at least one foreign language appropriate to the particular course. Applicants should include with their applications a personal statement indicating their reason for undertaking graduate study at the University of New Hampshire. Normally an entering student intending to be a candidate for the doctorate will complete an M.A. program as a prerequisite. However, students with the M.A. from another institution, or with exceptionally strong preparation at the undergraduate level, can begin the doctoral program immediately. In addition, a student in residence can, with the consent of the department, omit the M.A. and proceed directly toward the Ph.D.

M.A. Degree Requirements

A master's student designs a specific program to meet one of three plans. Plan A allows substantial training and research in a single subfield of history but within a foundation of broader coursework. Plan B allows substantial breadth over at least two subfields. The subfields in history include the following: the ancient world, medieval Europe, early modern Europe, modern Europe, European intellectual history, medieval England, early modern England, modern England, early modern France, modern France, early modern Germany, modern Germany, Iberia, Russia, early U.S., modern U.S., colonial Latin America, modern Latin America, the Far East, the Near East, sub-Saharan Africa, and the history of science. Plan C allows students who enter the doctoral program without an M.A. to pursue the M.A. and Ph.D. degrees simultaneously.

Plan A: At least eight courses in history numbered 800 or above, including at least one research seminar; a thesis in a single subfield (equivalent to two courses).

Plan B: At least ten courses in history numbered 800 or above, including at least one research seminar; oral examination demonstrating competence in two subfields of history.

Plan C: At least 30 credits of coursework during preparation for the Ph.D. qualifying examinations, as described below; submission of a seminar or other research paper as a demonstration of competence in basic research techniques; passing Ph.D. qualifying examinations.

Museum Studies Option

Students who are seeking or considering careers in the museum world, rather than in teaching and/or research, may pursue the option in museum studies. Students basically follow Plan B. Of the ten required courses, students must take History 871, Museum Studies; History 872, Studies in Regional Material Culture; one research seminar; and two internships taken for credit in nearby museums or other historical institutions. The final requirement is *either* a one-hour oral exam or the completion of a major project related to the student's work in museum studies.

Ph.D. Degree Requirements

A doctoral student's program, which must be approved by the graduate committee of the department, shall include each of the following requirements:

1) two research seminars; one in early U.S. history and one in modern U.S. history;
2) two reading seminars, one in early U.S.history and one in modern U.S. history;
3) a course in historical methods;
4) correction of any deficiencies in the student's previous program;
5) two languages or one language and a special research technique, whichever is deemed most relevant to the area of research;
6) all doctoral candidates awarded teaching assistantships must take History 970, Graduate Seminar in Teaching History;
7) preparation through reading and coursework in the entirety of U.S. history, with accent upon either early or modern U.S.;
8) preparation through reading and coursework of two subfields outside of U.S. history, one of which may be a cognate field outside of history entirely;
9) qualifying exams;
10) dissertation and successful defense.

Note: In the definition of fields above, "United States" and "U.S." are understood to mean the United States and its colonial antecedents.

Apprenticeship

The department considers that graduate work in history, and particularly doctoral work, is professional training. The department recognizes the dual concerns of the historian's life—teaching and research; when feasible, therefore, all doctoral students are expected to undertake teaching in the department during a part of their residence. Participation in proseminar and in teaching constitutes an apprenticeship in conjunction with formal study. Doctoral students may choose to pursue the Cognate in College Teaching offered through the Graduate School.

All graduate students are reviewed annually by the faculty of the department. A student accumulating two course failures is automatically barred from continuing in any degree program in history, but the department reserves the right to exclude others whose overall performance does not give reasonable assurance of a successful program completion. Students are allowed no more than three attempts to meet any language requirement.

Courses

800	Advanced Exploration in History	1 to 4 cr.
801	Seminar in Religious Texts	4 cr.
803	The European Conquest of North America	4 cr.
805	Revolutionary America, 1750-1788	4 cr.
806	History of the Early Republic	4 cr.
809	U.S. Legal History Special Topics	4 cr.

811	The Civil War Era	4 cr.
815	20th-Century United States	4 cr.
816	20th-Century United States	4 cr.
817	The Vietnam War	4 cr.
818	American Environmental History	4 cr.
819	The Foreign Relations of the United States	4 cr.
820	The Foreign Relations of the United States	4 cr.
821	History of American Thought	4 cr.
822	History of American Thought	4 cr.
823	Early American Social and Cultural History	4 cr.
825	Southern History and Literature Since 1850	4 cr.
831	History of Brazil	4 cr.
832	Latin American History: Topics	4 cr.
839	Christan Monsticsm Medevl West	4 cr.
840	Holy War in the Holy Land: The Medieval Crusades	4 cr.
841	Europe After the Black Death	4 cr.
842	Religious Conflict in Early Modern Europe	4 cr.
847	Early Modern France	4 cr.
848	Modern France	4 cr.
851	Topics in European Intellectual History	4 cr.
852	Topics in European Intellectual History	4 cr.
854	Topics in the History of Science	4 cr.
856	20th Century Europe	4 cr.
861	England in the Tudor and Stuart Periods	4 cr.
862	England in the Tudor and Stuart Periods	4 cr.
864	Russia: Modernization through Soviet Empire	4 cr.
865	Themes in Women's History	4 cr.
869	Germany from 1918 to Present	4 cr.
871	Museum Studies	4 cr.
872	Studies in Regional Material Culture	4 cr.
873	The Early History of Ancient Greece	4 cr.
874	Historiography	4 cr.
875	Historical Methods	4 cr.
876	The Classical and Hellenistic Greek Worlds	4 cr.
877	The Roman Republic	4 cr.
879	Workshop in History and Historical Methods	1 to 6 cr.
880	Special Topics in Museum Studies/ Material Culture	3 cr.
881	Topics History of Modern China	4 cr.
884	History of Southern Africa Since 1652	4 cr.
887	Quantitative Methods and Computers for Historians	4 cr.
888	African Religions	4 cr.
898	Internship in Museum Studies	4 cr.
899	Master's Thesis	6 cr.
939	Readings in Early American History	3 cr.
940	Readings in Modern American History	3 cr.
949	Colloquium in U.S. History	3 cr.
952	Colloquium Comparative History	3 cr.
970	Graduate Seminar in Teaching History	2 cr.
989	Research Seminar in American History	3 cr.
990	Research Seminar in American History	3 cr.
995	Tutorial Reading and Research in History	1 to 6 cr.
997	Directed Readings in Early American History	1 to 6 cr.
998	Directed Readings in Modern U.S. History	1 to 6 cr.
999	Doctoral Research	

Hydrology

(See Earth Sciences.)

Kinesiology (KIN)

Professors: Ronald V. Croce, Michael A. Gass, Stephen H. Hardy
Associate Professors: Heather Barber, John P. Miller, Timothy J. Quinn, Neil B. Vroman
Assistant Professors: Thomas W. Ashwell, Robert W. Kenefick, Deborah A. Sugerman, Erik E. Swartz

Degree Offered

The Department of Kinesiology offers a Master of Science degree with the following areas of concentration: exercise science, outdoor education, and sport studies.

Admission Requirements

Admission is based on undergraduate preparation, academic record, Graduate Record Examination general test scores, and letters of recommendation. Applicants must be above-average students and show adequate preparation in the basic support courses of the selected concentration area. Applicants who have not met specific course prerequisites should expect to take additional undergraduate work without receiving graduate credit.

M.S. Degree Requirements

Students may follow either the thesis or the nonthesis plan. All degree candidates will be required to take KIN 900, Applied Statistics; KIN 901, Analysis of Professional Literature; the designated concentration core; and electives as required.

Exercise science core: 804, Clinical Stress Testing and Electrocardiography; 805, Topics in Applied Physiology; two semesters of 902, Colloquium.

Sport studies core: 880, Psychological Factors in Sport; one adviser-approved KIN elective at the 800 or 900 level; one of either KIN 840, Athletic Administration or KIN 843, Sport Marketing.

Outdoor education core: 884, Programs in Adventure Education; 885, Foundations of Adventure Education; 886, Management of Outdoor Education Programs; 986, Outdoor Education Seminar.

Any remaining coursework in the concentrations should be taken within the Department of Kinesiology; however, approval may be granted to take relevant courses outside the department.

Thesis plan: A minimum of 30 approved graduate credits including a thesis (24 graduate course credits plus 6 thesis credits) is required in the thesis plan plus an oral defense of the thesis.

Nonthesis plan: A minimum of eight approved graduate courses (with a minimum of 30 credits) is required in the nonthesis plan. Four credits of 895, Advanced Studies, are required. A student may take 895 only after completing at least three approved graduate courses including 901. Exercise science students who elect this plan must take 6 credits of 896, Advanced Research in Exercise Science. In addition, the exercise science student must orally defend his or her research.

Courses

804	Clinical Stress Testing and Electrocardiography	4 cr.
805	Topics in Applied Physiology	4 cr.
806	Neurology	4 cr.
807	Neurology Lab	1 cr.
824	Metabolic Adaptations to Exercise	4 cr.
840	Athletic Administration	4 cr.
841	Social Issues in Contemporary Sports	4 cr.
843	Sport Marketing	4 cr.
847	Sport Broadcasting	4 cr.
850	Theories of Motivation in Sport and Exercise	4 cr.
870	Psychological Skills in Performance	4 cr.
880	Psychological Factors in Sport	4 cr.
881	Special Physical Education Pedagogy	4 cr.
882	Therapeutic Applications of Adventure Programming	4 cr.
884	Programs in Outdoor Education	4 cr.
886	Organization and Administration of Outdoor Education	4 cr.
890	Social and Health Issues in Sport Psychology	4 cr.
895	Advanced Studies	2 to 4 cr.
896	Advanced Research in Exercise Science	3 or 6 cr.
898	Special Topics	1 to 4 cr.
899	Master's Thesis	6 cr.
900	Applied Statistics	4 cr.
901	Analysis of Professional Literature	4 cr.
902	Colloquium	1 cr.
950	Internship	2 to 4 cr.
985	Change Process Adventure Prog	4 cr.
986	Outdoor Education Seminar	4 cr.

Liberal Studies (LS)

Professors: David S. Andrew, Art History; Barbara T. Cooper, French; Michael K. Ferber, English; Barbara E. Houston, Education; Mara R. Witzling, Art History

Degree Offered

The program offers a master of arts in liberal studies (M.A.L.S.) degree. The master of arts in liberal studies is an innovative, interdisciplinary graduate program. Housed within the College of Liberal Arts but drawing its courses and instructors from

across the University, the program makes available a diverse spectrum of offerings and a wealth of faculty expertise and resources.

The liberal studies curriculum is intended to promote broad intellectual comprehension and enrichment rather than vocational or professional training within a single field or discipline. Designed to address the particular interests of students who seek to deepen their knowledge, the program offers a challenging but flexible program of cross-disciplinary learning.

Admission Requirements

Admission to the master of arts in liberal studies is selective. A bachelor's degree is required for admission. Students will be asked to provide relevant transcripts of their educational experience, a résumé, and letters of recommendation. They will also be asked to submit a brief essay describing why they are particularly interested in this program and indicating (tentatively) the sort of interdisciplinary focus or area of learning in which they might like to concentrate their study. The Graduate Record Exam (GRE) is not required but is helpful.

M.A.L.S. Degree Requirements

The program consists of seven courses (30 credits) divided into three parts: (1) a core seminar specifically designed for and required of every student, to be taken within one year of entrance to the program; (2) a concentration made up of five elective courses chosen from various disciplines across the liberal arts that centers on an interdisciplinary theme or topic; and (3) a master's thesis or project which is intended to act as an integrating capstone experience for liberal studies students.

1. Core seminars 800 (4 credits): Each liberal studies student is required to take one core seminar as an introduction to the program as a whole. The seminar must be taken within the first year of a student's matriculation in the program, preferably in the first semester. Although all the core seminars focus on interdisciplinary issues and themes, each is meant to introduce students not only to different topics but also divergent disciplines from across the liberal arts such as literature, the arts, philosophy, history, women's studies, political science, sociology, and the like.

2. Concentration (20 credits): In conjunction with the director of the program and a concentration and thesis adviser, students develop a proposed, interdisciplinary concentration program of study made up of five, graduate-level elective courses offered in various departments throughout the college and university. The concentration is an interdisciplinary study which focuses on a significant topic, issue, perspective, or cultural development. A concentration may be selected from a menu of suggested concentrations or may be self-designed and tailor-made for each student with the help of his or her advisor. The five courses which constitute the concentration are to be selected from 700-900-level courses regularly offered within departments and colleges across the University, including up to three independent study courses carried out as a tutorial with particular faculty members (with permission).

This cluster of five concentration courses, then, is designed to fit the particular interests and experience of each liberal studies student and should, in combination, constitute a sustained thematic exploration. It is expected that a student's concentration will culminate in a concluding final project or thesis.

The following are typical examples of cross-disciplinary concentration programs of study: American studies, the humanities, ecology and values, justice studies, labor studies, religious studies, urban studies, women's studies.

3. LS 898 Project or LS 899 Thesis (6 credits): This is meant to be a capstone experience in which, with the support of their concentration and thesis adviser, students work out a final project consistent with their concentration and interests. The project can be a scholarly thesis or equivalent creative endeavor which integrates the student's learning in a particular concentration. The director of the program will meet periodically with those students enrolled for thesis credit in order to provide a forum for discussing their research and writing.

Courses

800	Core Seminar	4 cr.
845	Special Topics	2 to 4 cr.
846	Special Topics	2 to 4 cr.
895	Independent Study	1 to 6 cr.
896	Independent Study	1 to 6 cr.
898	Master's Project	6 cr.
899	Master's Thesis	6 cr.
900	College Teaching	2 cr.
901	Introduction to Research	1 cr.

Materials Science (MS)

Professors: Olof Echt, Physics; Todd Stuart Gross, Mechanical Engineering; Thomas M. Laue, Biochemistry
Associate Professors: James E. Krzanowski, Mechanical Engineering; Donald C. Sundberg, Chemical Engineering
Assistant Professors: Carmela C. Amato-Wierda; Karsten Pohl, Physics; Igor I. Tsukrov, Mechanical Engineering
Research Assistant Professor: Yvon Durant

Degree Offered

The Materials Science program offers a Master's of Science in Materials Science and a Materials Science option for the Ph.D. in Engineering. The program offers research opportunities over a broad range of areas including synthesis, deposition, and characterization of thin films, self-organizing nanostructures, scanning probe microscopy, chemical vapor deposition, polymer synthesis and processing, molecular interaction science, micromechanics, molecular beam mass spectrometry, fullerene characterization, morphology and synthesis of polymer nanoparticles.

Admission Requirements

A minimum G.P.A. of 3.0 is required but undergraduate students with exceptional experience or other mitigating factor will be considered. The Graduate Record Examination is recommended but not required for admission into the program.

Since materials science is an interdisciplinary field, students from mechanical engineering, chemical engineering, electrical engineering, chemistry, mathematics, physics and other engineering and science related disciplines are considered. A suitable undergraduate program should ideally contain: multivariable calculus and differential equations, two semesters of university (calculus-based) physics, one semester of thermodynamics or physical chemistry, one semester of computer programming, one semester each of fluid mechanics and heat transfer or two semesters of solid mechanics, and one semester of materials science.

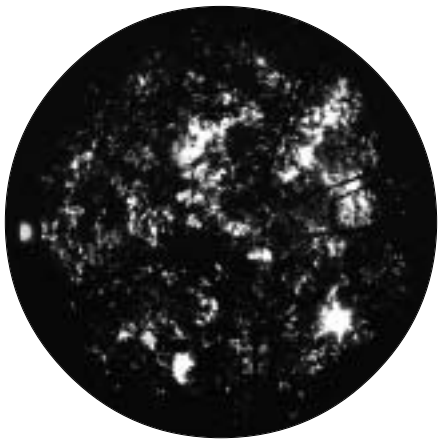
Faculty are available to evaluate each student's undergraduate curriculum to identify any areas that need more depth or any areas that may satisfy one of the focus areas in our program. A series of appropriate courses will be required for those students with deficiencies in their undergraduate program.

Doug Prince

Above: Pontius uses a gun to shoot down samples of the hemlock's sun canopy.

At left: the hemlock wooly aldegid.

Below: infestation on the underside of the hemlock needles.



Healthy hemlock canopy.

The canopy after wooly hemlock adelgid infestation.

Jennifer Pontius

Ph.D. student, Natural Resources

Enlarged, the hemlock wooly adelgid, a microscopic sucking aphid, "is definitely a funky looking pest," says Jennifer Pontius. She hopes to help integrated pest management programs more effectively combat the adelgid.

To accomplish this, Pontius travels throughout the northeast, taking samples to track the advance of the adelgid and to analyze the trees' chemistry.

The adelgid, which first appeared in the 1980s in the northeast, travels at about 10 to 15 miles per year via wind and birds. It appears on eastern hemlock needles as a woolly mass that sticks to the tree's needles. Then, they literally suck the trees dry.

"This is one of our first opportunities to study a forest pest from beginning to end," she says. "Hemlock stands create a unique microenvironment that is warm in winter and cool in summer. The stands are important for overwintering deer populations, native brook trout, and the black-throated green warbler."

When Pontius completes her doctorate, she will continue her work as a research scientist with the U.S.D.A. Forest Service Northeast Research Station in Durham.

Students will be considered for admission into the Ph.D. program after they have completed an M.S. degree or 24 credits of graduate courses in materials science with at least six credits at the 900 level.

M.S. Degree Requirements

A student will meet the Graduate School's requirements for the master's degree (30 credits). There is a thesis option and a project option. In both options, the student is required to take MS 860, Thermodynamics and Kinetics of Materials; MS 961, Thermodynamics and Kinetics of Materials II; one course each satisfying the areas of synthesis and processing, characertization, and structure-property relationships and take two semesters of MS 900, Materials Science Seminar. For the thesis option, the student will take one additional course (24 course credits) and six credits of MS 899, Master's Thesis. For the project option, the student will take two additional courses (27 course credits) and three credits of MS 898, Master's Project. All students are expected to take at least six course credits at the 900 level.

Ph.D. Option Requirements

Students must complete 39 post-baccalaureate course credits. The student is expected to take MS 860, Thermodynamics and Kinetics of Materials I; MS 961, Thermodynamics and Kinetics of Materials II; one course each satifying the areas of synthesis and processing, characterization, and structure-property relationships and take two semesters of MS 900, Materials Science Seminar. In addition, the student must take five additional courses with at least 12 total credits at the 900 level (including those courses taken at the Master's level).

The student will be advanced to candidacy after he/she has completed an M.S. degree or 24 credits of graduate courses with at least six credits at the 900 level and the qualifying examination. The qualifying exam shall consist of two parts. The student must present a written proposal adhering to NSF guidelines, followed by an oral defense of that proposal. In addition, the student must submit a substantive review paper and an oral presentation on that paper. A materials science program faculty committee will determine the subject of the paper. A substantive record of publication in conjunction with an oral presentation at a conference may substitute for the review paper. A materials science program faculty committee will decide whether the previous publication record is substantive. The committee will evaluate the paper, the proposal, and the two oral presentations to determine whether the student is suitably prepared for graduate research at the Ph.D. level. The proposal and paper for the qualifying exam should normally be completed within six months of completing 24 credits of coursework.

Upon the successful completion of the qualifying examination, the student is advanced to candidacy and, upon the recommendation of the graduate coordinator, a doctoral committee is appointed by the dean of the Graduate School. The doctoral committee conducts an annual review of the student's progress, supervises and approves the doctoral dissertation, and administers the final dissertation defense.

Courses

830	Mechanical Behavior Materials	4 cr.
831	Fracture and Fatigue Engineering Materials	4 cr.
844	Corrosion	4 cr.
860	Thermodynamics and Kinetics of Materials I	4 cr.
861	Diffraction and Imaging Methods in Materials Science	4 cr.
862	Electronic Properties of Materials	3 cr.
863	Thin Film Science and Technology	4 cr.
898	Materials Science Master's Project	3 to 4 cr.
899	Master's Thesis	6 cr.
900	Materials Science Seminar	1 cr.
961	Thermodynamics and Kinetics of Materials II	4 cr.
965	Advanced Surface and Thin Film Characterization	4 cr.
999	Doctoral Research	

Mathematics and Statistics (MATH)

Professors: Kenneth I. Appel, Albert B. Bennett, Jr., Marie A. Gaudard, Liming Ge, Karen J. Graham, Donald W. Hadwin, Rita A. Hibschweiler, A. Robb Jacoby, Joan R. Leitzel, Ernst Linder, Eric A. Nordgren, Samuel D. Shore, Donovan H. Van Osdol
Associate Professors: Kelly J. Black, David V. Feldman, William E. Geeslin, Edward K. Hinson, Berrien Moore III, Kevin M. Short, Debajyoti Sinha
Assistant Professors: Maria Basterra, Mitrajit Dutta, John B. Geddes, Yeping Li, Dmitri A. Nikshych, William Jason Owen

Degrees Offered

The Department of Mathematics offers programs leading to a master of science for teachers (M.S.T.) in mathematics, master of science (M.S.) in mathematics, an M.S. in mathematics with an option in applied mathematics, an M.S. in mathematics with an option in statistics, a doctor of philosophy (Ph.D.) in mathematics, and a doctor of philosophy (Ph.D.) in mathematics education.

In general, the master's degree programs offer the student a high level of preparation for professional employment as well as appropriate preparation for programs leading to the Ph.D. degree. The Ph.D. programs prepare the student primarily for a career in university teaching and research.

The graduate programs have limited enrollments, allowing students to work closely with the faculty members in their areas of expertise. Research is currently being conducted in many areas of the mathematical sciences, including operator theory, Hilbert spaces, complex analysis, ring theory, commutative algebra, combinatorics, topology, numerical analysis, nonlinear dynamics and chaos, applied mathematics, industrial statistics, environmental statistics, spatial statistics, Bayesian survival analysis, and in calculus learning, K–12 mathematics education reform, and mathematics education.

Admission Requirements

Applicants for the M.S. and Ph.D. degrees must have completed significant undergraduate coursework in mathematics, preferably in algebra, analysis, and topology. Applicants for the M.S. with applied mathematics option must have completed significant coursework in analysis or applied analysis and, preferably, coursework in algebra. Applicants for the M.S. with statistics option must have completed mathematical coursework at least through multivariate calculus and differential equations. Among applicants for the Ph.D. degree in mathematics education preference will be given to those who have completed courses in mathematics education and have teaching experience. Applicants for the degree of master of science for teachers must have completed education courses sufficient for certification, or have three years of teaching experience, or currently hold a full-time teaching position.

M.S. Degree Requirements

The program requires ten semester courses approved by the department and chosen from courses numbered 801–888 or 931–979; at least six of the ten courses must be from the 931–979 group. A comprehensive master's examination is required (except as indicated).

Applied Mathematics Option
The program requires ten semester courses approved by the department and a research project or thesis equivalent to two semester courses. The required courses are 853, 854, 931, 932, 951, 953, 954, 963, 967, and 977; the last two of these are topics courses which may be replaced by approved courses in other departments. The research project or thesis must constitute original research in applied mathematics, conducted under the supervision of a faculty adviser. There is no comprehensive exam in this option.

Statistics Option
The program requires ten semester courses approved by the department, one of which leads to the completion of a project consisting of the substantial application of statistical methodology to a real problem. The program requires: courses 855, 856, 839, 840, and 862; four courses chosen from 841, 842, 845, 846, 853, 854, 931, 932, 953, 963, 967, 969, 973, 977, 979, of which at least two must be from 841, 842, 969, 979; and a project carried out in course 898 and conducted under the supervision of a faculty adviser.

Master of Science for Teachers Degree Requirements

The program requires ten semester courses approved by the department. These will normally be taken from the courses numbered 901–929, and will usually include the seven courses numbered 903–908 and 925. A concluding experience consisting of a mathematics portfolio and a comprehensive problem set is required. The courses in this program are offered primarily during summer sessions.

Ph.D. Degree Requirements

In each Ph.D. program, requirements 1-4 must be completed for advancement to candidacy. Students in the Ph.D. program in mathematics who intend to write a dissertation in statistics must satisfy the alternate set of basic requirements given below.

Basic degree requirements for the Ph.D. program: (1) all of the courses numbered 951–955; (2) written comprehensive examinations in algebra, analysis, topology, and an advanced elective subject (advanced algebra, algebraic topology, complex analysis, functional analysis, applied mathematics, mathematics education, statistics, etc.).

Alternate basic degree requirements for students in the Ph.D. program in mathematics who intend to write a dissertation in statistics: 1) all of the courses 839, 840, 855, 856, 951, 953, and 954; 2) written comprehensive examinations in statistical theory, statistical methods, analysis and either applied mathematics or functional analysis.

Additional degree requirements for the Ph.D. in mathematics: (3) proficiency in a foreign language, which includes resource-aided translation of research mathematics written in the language; (4) advanced coursework in a major field (that of the dissertation) and a minor field (usually in mathematics, but possibly in statistics mathematics education or another approved field), followed by a qualifying examination; (5) experience in teaching equivalent to at least half-time for one year; and (6) a dissertation that includes original results in mathematics.

Additional degree requirements for the Ph.D. in mathematics education: (3) proficiency in a foreign language, which includes translation of mathematics education research written in the language, and mastery of an approved research tool; (4) advanced coursework in the major field (mathematics education), including MATH 958, 968A, and 968B, and in a minor field (usually a related one, such as educational psychology or research methodology, but possibly in mathematics) followed by a qualifying examination; (5) experience in teaching equivalent to at least half-time for one year; and (6) a dissertation that includes original research in mathematics education.

Courses

A maximum of four 800-level courses (excluding MATH 898/899) may be applied to the degree of master of science in mathematics.

Courses numbered 903 through 929 may be applied to the degree of master of science for teachers in mathematics and to no other degree in mathematics.

Courses numbered 931 through 958 are introductory courses for the M.S. degree in mathematics and the Ph.D. degrees in mathematics and mathematics education.

Courses numbered 961 through 979 are more specialized topics courses that are offered periodically in response to faculty and student interests. Content may vary from year to year. With the permission of the instructor, these courses may be taken more than once.

835	Statistical Methods for Researchers	3 cr.
837	Statistical Methods for Quality Improvement	3 cr.
839	Regression Analysis	3 cr.
840	Design of Experiments I	3 cr.
841	Biostatistical Methods	3 cr.
844	Design of Experiments II	3 cr.
845	Foundations of Applied Mathematics	3 cr.
846	Foundations of Applied Mathematics	3 cr.
847	Introduction to Nonlinear Dynamics and Chaos	3 cr.
853	Introduction to Numerical Methods	3 cr.
854	Introduction to Scientific Computing	3 cr.
855	Probability and Stochastic Processes	3 cr.
856	Principles of Statistical Inference	3 cr.
861	Abstract Algebra	3 cr.
862	Linear Algebra	3 cr.
867	One-Dimensional Real Analysis	3 cr.
884	Topology	3 cr.
888	Complex Analysis	3 cr.
896	Topics in Mathematics	3 cr.
898	Master's Project	6 cr.
899	Master's Thesis	6 cr.
903	Higher Algebra for Teachers	3 cr.
904	Higher Algebra for Teachers	3 cr.
905	Higher Geometry for Teachers	3 cr.
906	Higher Geometry for Teachers	3 cr.
907	Higher Analysis for Teachers	3 cr.
908	Higher Analysis for Teachers	3 cr.
910	Mathematics Education	1 to 4 cr.
912	Exploring Data and Planning Investigations	3 cr.
914	Topology for Teachers	3 cr.
916	Theory of Numbers for Teachers	3 cr.
917	Mathematical Proof and Problem Solving	3 cr.
920	History of Mathematics	3 cr.
925	Problem Solving Seminar	3 cr.
928	Selected Topics in Mathematics for Teachers	1 to 3 cr.
929	Directed Reading	3 cr.
931	Mathematical Physics	3 cr.
932	Mathematical Physics	3 cr.
951	Algebra I	3 cr.
952	Algebra II	3 cr.
953	Analysis I	3 cr.
954	Analysis II	3 cr.
955	Topology I	3 cr.
958	Foundations of Math Education	3 cr.
961	Topics in Algebra I	3 cr.
963	Functional Analysis	3 cr.
964	Topics in Analysis I	3 cr.
967	Topics in Applied Mathematics I	3 cr.
968	Topics in Mathematics Education I	3 cr.
969	Topics in Probability and Statistics I	3 cr.
973	Topics in Operator Theory	3 cr.
978	Topics in Mathematics Education II	3 cr.
979	Research Topics in Statistics	3 cr.
998	Reading Courses	1 to 6 cr.
999	Doctoral Research	

Mechanical Engineering (ME)

Professors: Kenneth C. Baldwin, Barbaros Celikkol, Barry K. Fussell, Todd Stuart Gross, Robert Jerard, M. Robinson Swift
Associate Professors: James E. Krzanowski, John Philip McHugh, David W. Watt
Assistant Professors: Gregory P. Chini, Brad Lee Kinsey, May-Win L. Thein, Igor I. Tsukrov

Degrees Offered

The Department of Mechanical Engineering offers a degree program at both the master's and doctoral levels.

The department offers studies leading to specialization in the following areas: fluid mechanics, thermal science, solid mechanics, material science, controls, system modeling, dynamics, and design.

The department offers the Ph.D. degree in four distinct subdisciplines: fluid and thermal science, material science, mechanics, and systems modeling.

Admission Requirements

A bachelor of science degree in mechanical engineering is normally required for admission to the graduate program in mechanical engineering. However, students from other disciplines may also be admitted to the program. For information on admissions requirements for students without a B.S. degree in mechanical engineering, please visit the department's Web site at www.unh.edu/mechanical-engineering, or contact the department graduate coordinator.

All applicants are required to submit scores from the general test of the Graduate Record Examination.

M.S. Degree Requirements

A candidate for the degree of master of science shall satisfy the requirements of either a thesis plan or a project plan. The thesis plan requires 24 semester hours of coursework in addition to eight semester hours of ME 899, Master's Thesis; the project plan requires 28 semester hours of coursework in addition to four semester hours of ME 992, Master's Project. Individuals who can demonstrate accomplishments from professional engineering experience comparable to that expected from a master's project may petition the department to substitute an additional 900-level course for the project requirement.

At least eight credits must be earned in 900-level courses other than ME 992, Master's Project or the 900-level course substituted for the master's project course. No more than two graduate courses taken prior to admission to the Graduate School may be applied to the master's degree. An oral examination covering the candidate's graduate work will be given for both the thesis and project plans.

Ph.D. Option Requirements

Following admission into the program, a guidance committee is appointed for the student by the dean of the Graduate School upon recommendation of the graduate coordinator. This committee assists in outlining the student's course of study and may specify individual coursework requirements.

A student entering with a B.S. degree must successfully complete at least 12 3-4 credit courses with three at 900 level. Students entering with a M.S. degree in engineering are required to take a minimum of five 3-4 credit courses with three at 900 level, although the committee may determine that additional coursework is necessary. The guidance committee also administers the qualifying examinations. The qualifiers consist of two-part examination: written and oral. Upon successful completion of required coursework, the qualifiers and a dissertation proposal, the student may advance to candidacy. A doctoral committee may be appointed once candidacy has been attained. The committee shall have at least five members.

Each Ph.D. candidate must conduct research of sufficient originality and significance to warrant the awarding of the Ph.D. degree. The final examination (oral defense) is the defense of the student's dissertation. This will be scheduled in accordance with the Graduate School rules. The candidate will be informed, in writing, by the dissertation chair of the results of the defense.

Courses

801	Macroscopic Thermodynamics	4 cr.
802	Statistical Thermodynamics	4 cr.
807	Analytical Fluid Dynamics	4 cr.
808	Gas Dynamics	4 cr.
809	Computational Fluid Dynamics	3 cr.
823	Advanced Dynamics	4 cr.
824	Vibrations Theory and Applications	4 cr.
827	Advanced Mechanics of Solids	4 cr.
841	Nonlinear Systems Modeling	4 cr.
857	Coastal Engineering and Processes	3 cr.
870	Design with Microprocessors	4 cr.
872	Control Systems	4 cr.
873	Electrochemical Analysis and Design	4 cr.
881	Mathematical Methods in Engineering Science I	4 cr.
883	Geometric Modeling	4 cr.
886	Introduction to Finite Element Analysis	4 cr.
895	Special Topics in Mechanical Engineering	2 to 4 cr.
899	Master's Thesis	1 to 8 cr.
904	Radiation Heat Transfer	4 cr.
906	Convection Heat Transfer	4 cr.
909	Viscous Flow	3 cr.
910	Turbulent Flow Analysis	4 cr.
911	Theory of Hydrodynamic Stability	3 cr.
922	Continuum Mechanics	4 cr.
926	Theory of Elasticity	4 cr.
944	Nonlinear Control Systems	4 cr.
951	Advanced Control Systems I	3 cr.
952	Advanced Control Systems II	3 cr.
955	Estimation and Filtering	3 cr.
982	Mathematical Methods in Engineering Science II	4 cr.
986	Advanced Finite Element Analysis	4 cr.
992	Mechanical Engineering Master's Project	4 cr.
995	Graduate Special Topics	2 to 4 cr.
999	Doctoral Research	

Microbiology (MICR)

Professors: Richard P. Blakemore, Thomas G. Pistole, Frank G. Rodgers, Robert M. Zsigray
Associate Professors: Aaron B. Margolin, Louis S. Tisa
Assistant Professor: Elise R. Sullivan

Degrees Offered

The Department of Microbiology offers the master of science and the doctor of philosophy degrees. Research opportunities are available in a broad range of areas, including plant-microbe interactions, nitrogen fixation, signal transduction, microbial development, Yersinia genetics, microbial immunity, molecular mechanisms of pathogenesis, environmental and molecular virology, microbial growth and regulation, marine microbial ecology, physiology and biochemistry, biotechnology, and bioremediation.

Admission Requirements

Applicants are expected to have had adequate preparation in the biological and physical sciences. This typically includes general and organic chemistry, physics, one semester of calculus, a year of general biology, a semester or more of biochemistry, and general microbiology. Formal courses in quantitative analysis and statistics are recommended. Applicants with deficiencies in these background courses who are admitted to the program may be required to complete appropriate coursework without graduate credit. Submission of Graduate Record Examination scores on the general test is required. Each applicant to the graduate program

must be sponsored by a faculty member in the department. The sponsor's decision is usually based on the "Statement of Interest" section of the Application to Graduate School form. Persons planning to apply to the program should contact the graduate program coordinator in microbiology to obtain information on the department.

M.S. Degree Requirements

Students admitted to the M.S. program are required to conduct an independent research project in conjunction with a faculty adviser and must submit a thesis based on this research to a faculty examining committee, which determines its acceptability. Students also defend their completed thesis work in a formal departmental seminar. Specific coursework is determined in conjunction with the faculty adviser. A minimum of 30 credits, including thesis credits, is required.

Ph.D. Degree Requirements

Students with appropriate academic training at the baccalaureate or master's level may be considered for admission to the doctoral program. Persons enrolled in the doctoral program are required to develop and execute an independent research project in conjunction with a faculty adviser, to complete and defend successfully a dissertation based on this research, to pass a written qualifying examination administered by the student's guidance committee, and to complete one semester of teaching.

The department's acceptance of the dissertation is contingent on (1) its approval by the doctoral committee, and (2) evidence that at least one manuscript based on the thesis research has been submitted to a refereed scientific journal appropriate to the topic.

All graduate students are expected to enroll in MICR 997, Microbiology Seminar, each semester.

Courses

800	Pathogenic Microbiology	5 cr.
804	Genetics Prokaryotic Microbes	4 cr.
805	Immunology	5 cr.
806	Virology	3 cr.
807	Marine Microbiology	5 cr.
808	Virology Lab	2 cr.
811	Genetics of Eukaryotic Microbes	4 cr.
813	Microbes and the Environment	5 cr.
814	Water Pollution Microbiology	4 cr.
817	Microbial Physiology	5 cr.
818	Ethics and Issues in Microbiology	3 cr.
819	Prokaryote Biodiversity	5 cr.
851	Cell Culture	5 cr.
866	Plant-Microbe Interactions	3 cr.
893	Advanced Problems and Techniques in Microbial Cytology	1 to 4 cr.
895	Special Topics in Microbiology	1 to 4 cr.
899	Master's Thesis	6 to 10 cr.
905	Current Topics in Microbiology	1 cr.
906	Hot Topics in Microbiology	1 cr.
907	Instrumentation	1 cr.
909	Advanced Virology	4 cr.
997	Microbiology Seminar	1 cr.
999	Doctoral Research	

Music (MUSI)

Professors: Nicholas N. Orovich, John E. Rogers, David E. Seiler, Robert Stibler, Peggy A. Vagts
Associate Professors: Michael J. Annicchiarico, Mark S. DeTurk, Robert W. Eshbach, Christopher Kies, Peter W. Urquhart, Larry J. Veal
Assistant Professors: Daniel Beller-McKenna, Andrew A. Boysen, Jennifer Carbaugh, William G. Kempster, David K. Ripley

Degree Offered

The Department of Music offers programs leading to the degree of master of arts with options in music history and in music education. The program is flexible, allowing the student to emphasize any of a variety of areas, and is built around a core curriculum stressing a broad knowledge of music. Graduates have established successful careers in performance, conducting, public school teaching, college teaching, and research. The program also serves as excellent preparation of doctoral study.

Admission Requirements

For the music history option a bachelor's degree in music, or its equivalent, from an accredited institution is required for admission; for the option in music education the requirement is a bachelor's degree in music education. A theory placement examination is required for all applicants. Students will not be allowed to enroll in MUSI 994, a required course, until this examination is passed to the satisfaction of the department. For the music history option a reading knowledge of both German and French is strongly recommended before entering the program. The department will administer a German reading examination. On recommendation of the graduate adviser, this requirement may be waived for students who do not plan to study in musicology beyond the M.A. degree. Applicants planning to enter the music history option should contact the graduate coordinator to submit a sample of their work. Applicants for music education option must arrange for an interview with the appropriate faculty member.

M.A. Degree Requirements

History Option This option offers the opportunity for in-depth study of music history and literature. The option has also proven valuable to students who wish to augment undergraduate degrees in performance and/or music education with more intensive studies in music theory, composition, music literature, instrumental and vocal performance, historical performance practices, and conducting. Required courses are MUSI 955, 956, 957, 958, 991, and 994. A written essay of substantive nature on a topic of the candidate's special interest is also required.

Music Education Option The goal of the option in music education is to develop a broad knowledge at the graduate level in the fields of music education, performance, history and theory. Required courses are MUSI 955, 994, and two courses selected from MUSI 956, 957, and 958. Also required are MUED 996 and either MUED 983 or 984. In this option each candidate will also complete an independent project (MUED 995) of a substantive nature in an area of the candidate's special interest as approved by the advisor.

For both options courses at the 800 and 900 levels in music, or at the 700, 800, and 900 levels in other departments, may be elected, with the approval of the student's advisor, to augment the required courses for a minimum total of 30 credits. For completion of the program in both options a comprehensive oral examination is required.

Music (MUSI) Courses

803	Music of the Renaissance	3 cr.
805	Music of the Baroque	3 cr.
807	Music of the Classical Period	3 cr.
809	Music of the Romantic Period	3 cr.
811	Music of the 20th Century	3 cr.
831	Conducting	2 cr.
832	Conducting	2 cr.
836	Graduate Early Wind Instruments	1 to 4 cr.
841	Graduate Piano	1 to 4 cr.
842	Graduate Harpsichord	1 to 4 cr.
843	Graduate Organ	1 to 4 cr.
845	Graduate Voice	1 to 4 cr.
846	Graduate Violin	1 to 4 cr.
847	Graduate Viola	1 to 4 cr.
848	Graduate Cello	1 to 4 cr.
849	Graduate Bass	1 to 4 cr.
850	Graduate Classical Guitar	1 to 4 cr.
851	Graduate Flute	1 to 4 cr.
852	Graduate Clarinet	1 to 4 cr.
853	Graduate Saxophone	1 to 4 cr.
854	Graduate Oboe	1 to 4 cr.
855	Graduate Bassoon	1 to 4 cr.
856	Graduate French Horn	1 to 4 cr.
857	Graduate Trumpet	1 to 4 cr.
858	Graduate Trombone	1 to 4 cr.
859	Graduate Euphonium	1 to 4 cr.
860	Graduate Tuba	1 to 4 cr.

861	Graduate Percussion	1 to 4 cr.
862	Graduate Keyboards	1 to 4 cr.
863	Graduate Jazz Guitar	1 to 4 cr.
864	Graduate Drum Set	1 to 4 cr.
871	Counterpoint	3 cr.
872	Counterpoint	3 cr.
875	Composition	3 cr.
876	Composition	3 cr.
877	Advanced Composition	3 cr.
879	Orchestration	3 cr.
881	Analysis: Form and Structure	3 cr.
882	Analysis: Form and Structure	3 cr.
885	Electronic Sound Synthesis	4 cr.
895	Special Studies in Music	1 to 4 cr.
955	Introduction to Bibliography	3 cr.
956	Readings in Music History: Antiquity to 1600	3 cr.
957	Readings in Music History: 1600 to 1820	3 cr.
958	Readings in Music History: 1820 to the Present	3 cr.
991	Research Seminar	1 to 4 cr.
994	Theory Seminar	3 cr.
995	Independent Study in the History and Theory of Music	1 to 4 cr.

Music Education (MUED) Courses

841	Techniques and Methods in Choral Music	2 cr.
842	Techniques and Methods in Choral Music	2 cr.
843	Materials and Methods in Piano Music	2 cr.
845	Techniques and Methods in String Instruments	2 cr.
846	Techniques and Methods in String Instruments	2 cr.
847	Techniques and Methods in Woodwind Instruments	3 cr.
848	Techniques and Methods in Woodwind Instruments	2 cr.
849	Techniques and Methods in Brass Instruments	2 cr.
851	Techniques and Methods in Percussion Instruments	2 cr.
863	Jazz Music Methods	2 cr.
865	Instrumental Music Methods	2 cr.
871	Marching Band Methods	2 cr.
890	Teaching Elementary School Music	3 cr.
891	Teaching Secondary School Music	3 cr.
892	Seminar in Music Teaching	2 cr.
895	Special Studies in Music Education	1 to 4 cr.
995	Special Projects in Music Education	1 to 4 cr.
996	Foundations and Perspectives of Music Education	4 cr.

Natural Resources (NR)

Professors: John D. Aber, John E. Carroll, Russell G. Congalton, Robert T. Eckert, Theodore E. Howard, John A. Litvaitis, William W. Mautz, William H. McDowell, Peter J. Pekins, Barrett N. Rock, Andrew A. Rosenberg
Research Professor: Frederick T. Short
Adjunct Professors: Christopher Eagar, C. Anthony Federer, Peter W. Garrett, James W. Hornbeck, William B. Leak, Sidney A. L. Pilgrim, Lawrence Safford, Paul Edwin Sendak, Tim D. Smith
Associate Professors: Kimberly J. Babbitt, Mimi Larsen Becker, Paul C. Johnson, Debra L. Straussfogel, Richard R. Weyrick
Research Associate Professors: David M. Burdick, Stephen H. Jones
Adjunct Associate Professors: William B. Bowden, Richard J. DeSeve, Linda S. Heath, David Y. Hollinger, Rakesh Minocha, Lawrence J. Prelli
Assistant Professors: Carl H. Bolster, Mark J. Ducey, Elizabeth A. Rochette
Research Assistant Professor: Mary E. Martin
Adjunct Assistant Professors: Jill L. Bubier, Bert Cohen, Jeffrey H. Gove, Richard Hallett, Marie-Louise Smith, Mariko Yamasaki

Degree Offered

The Department of Natural Resources offers a master of science in natural resources with options in five areas.

Forestry: forest resource economics and management, biometrics, genetics, forest ecosystem dynamics, remote sensing, and geographic information systems.

Environmental conservation: natural resource policy, conservation biology, sustainability, ecological ethics and values, international environmental affairs, and geospatial technologies.

Soil science: soil chemistry, soil classification and genesis, forest soils, and soil microbiology.

Water resources: wetlands, land-water interactions, groundwater chemistry, and biogeochemistry.

Wildlife: habitat evaluation and management, wildlife energetics, and population dynamics.

Admission Requirements

Applicants are expected to have completed either an undergraduate degree in the field in which they plan to specialize or show adequate preparation in the basic support courses of the field. Students with good undergraduate records who lack a background in a particular field may be admitted to a program, provided they are prepared to correct the deficiencies. All entering students must have taken at least one statistics course or do so at the graduate level. The Graduate Record Examination general test is required.

Students entering the forestry option may elect to develop concentrations within any of the above-listed areas. Applicants are expected to have backgrounds in forestry or related biological sciences. Entering students in soil science and water resources are required to have adequate preparation in chemistry and mathematics as well as biological or earth sciences. Students interested in wildlife are expected to have adequate preparation in biological sciences, chemistry, and mathematics. Students interested in environmental conservation should have a background appropriate for their area of interest. Since environmental conservation covers such a broad area, applicants are always reviewed carefully on an individual basis.

M.S. Degree Requirements

An M.S. degree is conferred upon successful completion of the following: (1) a program amounting to not less than 30 credits, including the following course requirements or equivalents: NR 993, Seminar, 1 cr.; NR 903, Approach to Research, 3 cr.; a quantitative methods course; NR 996, Natural Resource Education, 1 cr.; (2) NR 998, Directed Research, or NR 899, Thesis, up to 10 credits with permission if warranted; and (3) a final oral and/or written examination.

Cooperative Doctoral Programs

The Department of Natural Resources participates in three doctoral degree programs in cooperation with other departments in the University. The departmental faculty are an integral part of the interdisciplinary natural resources Ph.D. program, and opportunities for doctoral studies under all Department of Natural Resources faculty members are available through this program. In addition, a Ph.D. program in genetics is available to students in forestry through the genetics program, and a Ph.D. in environmental chemistry is available to soil science and water resources students through the chemistry department. Natural resource students specializing in forest ecosystem dynamics may conduct research through the Institute for the Study of Earth, Oceans, and Space.

Courses in Natural Resources (NR)

802	Natural Resource Workshops	1 to 4 cr.
802A	Natural Resource Workshop/ Watershed Ecology	1 to 4 cr.
802B	Natural Resource Workshop/ Sustainable Schools	2 cr.
802C	NR Wrkshp/Nature Study	1 to 4 cr.
802D	Wrkshp/GLOBE Teacher Training	1 to 4 cr.
802E	NR Wrkshp/Community Mapping	2 cr.
802F	NR Workshop/Forest Watch	1 to 4 cr.
802G	Natural Resource Workshops/Tools of Inquiry	2 cr.
809	Fire Ecology Seminar	2 or 3 cr.
812	Sampling Techniques	2 to 4 cr.
813	Quantitative Ecology	4 cr.
814	Ecosystems of Puerto Rico	1 cr.

830	Terrestrial Ecosystems	3 cr.
853	Decision Sciences in Natural Resources Management	4 cr.
857	Photo Interpretation and Photogrammetry	4 cr.
859	Digital Image Processing for Natural Resources	4 cr.
860	Geographic Information Systems in Natural Resources	4 cr.
896	Summer Institute in Environmental Education	8 cr.
899	Master's Thesis	6 to 10 cr.
901	Special Topics in Natural Resources	1 to 4 cr.
902	Ecological Ethics and Values	4 cr.
903	Approach to Research	3 cr.
947	Current Issues in Ecosystem Ecology	1 to 4 cr.
972	Laboratory Experiences Science	1 cr.
973	Large Enrollment Classes in the Sciences	1 cr.
993	Natural and Environmental Resources Seminar	1 cr.
996	Natural Resource Education	1 to 4 cr.
998	Directed Research	4 cr.

Environmental Conservation (EC)

802	Ecological Values and Ethics	4 cr.
803	Applied Environmental Philosophy	4 cr.
818	Law of Natural Resources and Environment	3 cr.
820	International Environmental Politics and Policies for the 21st Century	4 cr.
824	Resolving Environmental Conflicts	3 cr.
884	Sustainable Living	2 cr.
885	Systems Thinking for Sustainable Living	3 cr.
895	Investigations in Environmental Conservation	1 to 4 cr.
995	Investigations/Environmental Conservation	1 to 4 cr.

Forestry (FOR)

822	Advanced Silviculture	3 cr.
834	Forest Protection Seminar	3 cr.
845	Forest Management	4 cr.
854	Wood Products Manufacture and Marketing	4 cr.
855	Regional Silviculture and Forest Management	2 cr.
910	Forest Stand Dynamics	4 cr.
930	Modeling of Forest Ecosystems	3 cr.
995	Investigations in Forestry	1 to 4 cr.

Soil Science (SOIL)

802	Chemistry of Soils	3 cr.
804	Soil Genesis and Classification	4 cr.
805	Forest Soils	4 cr.
810	Contaminant Fate and Migration in Soils	4 cr.
902	Special Topics in Soil Science	1 to 3 cr.
949	Pedology	4 cr.
995	Independent Work in Soil Science	1 to 4 cr.

Water Resources (WARM)

800	Critical Analysis of Water Resources Literature	2 cr.
803	Watershed Water Quality Management	4 cr.
811	Wetland Resource Management	4 cr.
816	Wetland Delineation	4 cr.
821	Ecology of Polluted Waters	4 cr.
995	Independent Work in Water Resources Management	1 to 4 cr.

Wildlife (WILD)

810	Endangered Species Seminar	2 cr.
837	Wildlife Population Dynamics	3 cr.
838	Wildlife Policy and Management	4 cr.
839	Methods in Wildlife Demography and Conservation Biology	3 cr.
872	Wildlife Energetics	2 cr.
995	Investigations in Wildlife Management	1 to 4 cr.

Natural Resources Ph.D. Program (NRP)

Professors: John D. Aber, John E. Carroll, Russell G. Congalton, Garrett E. Crow, S. Lawrence Dingman, Robert T. Eckert, Richard W. England, John M. Halstead, Lawrence C. Hamilton, Theodore E. Howard, Bruce E. Lindsay, John A. Litvaitis, William W. Mautz, William H. McDowell, Dennis Meadows, Berrien Moore III, Peter J. Pekins, Barrett N. Rock
Research Professors: Janet W. Campbell, Patrick M. Crill, Changsheng Li, Dork L. Sahagian, Frederick T. Short
Adjunct Professors: C. Anthony Federer, James W. Hornbeck
Associate Professors: Eleanor D. Abrams, Kimberly J. Babbitt, Mimi Larsen Becker, Michael J. Carter, Drew Christie, Kurk Dorsey, Paul C. Johnson, Thomas D. Lee, Douglas E. Morris, Robert A. Robertson, Timm A. Triplett, Richard R. Weyrick
Research Associate Professor: David M. Burdick
Adjunct Associate Professor: David Y. Hollinger
Assistant Professors: Carl H. Bolster, Mark J. Ducey, Elizabeth A. Rochette
Research Assistant Professors: Stephen E. Frolking, George C. Hurtt, Mary E. Martin, Scott Ollinger, Mary-Louise Smith
Adjunct Assistant Professor: Richard Hallett

Degree Offered

The natural resources program is an interdepartmental program offering only the Ph.D. degree for interdisciplinary work in areas related to the understanding and management of natural resources in the broadest context. Areas of study include ecosystem science, biogeochemical cycling from local to global scales, social science, ethical and policy issues, and multidisciplinary natural resources management.

Admission Requirements

Applicants to the natural resources program come from a wide range of undergraduate majors. Individuals are judged as to the quality of their work and its relevance to the particular area of study they propose to pursue. All applicants must identify an adviser before being admitted, and this adviser must agree to take on the new student. Certain applicants may be admitted with deficiencies identified by their adviser and by the executive committee. These deficiencies must be corrected through coursework in the first year of the program.

Ph.D. Degree Requirements

A guidance committee consisting of at least three members will advise the student on specific choices for coursework, assist the students in formulating the dissertation topic, and conduct required examinations. All students will be required to inform the guidance committee and complete the program's course approval form within a year of matriculation.

Credit and Course Requirements:
1. Completion of one course from each of the following five core areas: a) concepts of natural resource management; b) problems in natural resource management; c) ethics; d) experimental design; e) seminar.

2. Completion of additional coursework to enhance the student's selected field of study and/or correct any deficiencies in the student's previous program.

3. An expectation of 36 credit hours beyond the bachelor's degree. Final credit requirements to be determined by the guidance committee.

4. Language proficiency may be required at the discretion of the student's adviser/committee. If so required, a student would need to show proficiency in one foreign language or one computer language.

Exam Requirements:
Each student is required to pass three examinations, each of which has both a written and oral component. Additional preliminary examinations may be administered as the committee deems necessary, to determine areas where the student may need additional coursework.

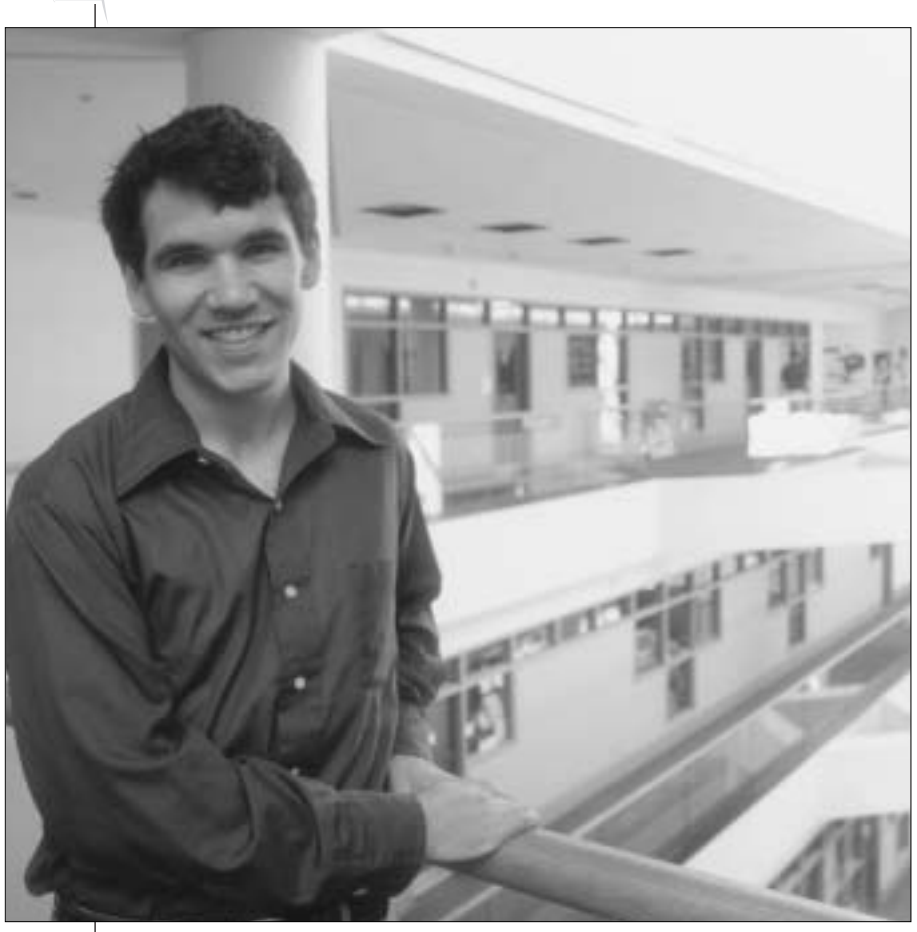
1. *Comprehensive exam.* The students must prepare an extensive written answer to one question from each committee member which covers the basic concepts and factual material deemed essential for the student's program. Three weeks are allowed for completion of the exam, after which the student gives an oral presentation to the committee.

2. *Proposal exam.* The student must present a written summary of the proposed dissertation research topic to the committee and complete a public oral presentation of the proposed research. Students are advanced to candidacy after successfully completing the

Profile

Stephen Hagen

Ph.D. student, Natural Resources



Lisa Nugent

"In Brazil I could see and feel what we were modeling," Hagen smiles, "and it got me out of the glow of the computer."

As a child, Stephen Hagen was fascinated by numbers. "I had a baseball simulation game, but what interested me were the statistics," he recalls.

At the University of Virginia, he found that systems engineering was a good fit and earned both his B.S. and his master's degree. "I also took some classes in ecology and was fortunate to work with Hank Shugart, a noted ecosystems scientist," Hagen explains. "He had me work on a small part of one of his global change models.

"Most people in systems engineering apply their skills to finance or informational technology, but I was interested in environmental systems. Shugart recommended UNH, and I was accepted despite my lack of a degree in environmental science."

Hagen has been making up for that deficit by taking environmental courses at UNH. "My research path is tropical ecosystems and their biogeochemical cycles," says Hagen. He works with remote sensing, imaging the Earth to get an idea of the land cover, studying the images and bringing that information into biogeochemical models.

This summer Hagen visited Brazil to conduct fieldwork with a colleague in the Institute for the Study of Earth, Oceans, and Space (EOS).

comprehensive and proposal exams, and all coursework required by the commitee as summarized on the course approval form. A doctoral committee will then be appointed. Students are strongly encouraged to include one committee member from off campus. The committee chair shall be a member of the NRP faculty.

3. *Final exam.* The student must complete the written Ph.D. dissertation prior to the final exam. Once written, the student is rquired to complete an oral defense of the dissertation, which will include both a public presentation and examination by the student's committee.

Courses

995	Independent Study	1 to 4 cr.
999	Doctoral Research	

Nursing (NURS)

Professors: Gail A. Harkness, Judith A. Sullivan
Associate Professors: Gene E. Harkless, Margaret A. Lamb, Dorothy D. Rentschler, Raelene Shippee-Rice, Carol L. Williams-Barnard
Assistant Professors: Katherine S. Collopy, Pamela P. DiNapoli, Susan J. Fetzer, Liza Little, Joan S. Reeves

Degree Offered

The Department of Nursing offers the Master of Science degree in nursing. Three clinical practice tracks are currently offered. These include adult nurse practitioner/clinical nurse specialist, family nurse practitioner, and clinical nursing.

Admission Requirements

Registered nurses who hold a baccalaureate degree in either nursing or another field are considered for admission. Applicants are required to have a good academic record, satisfactory scores on either the Graduate Record Examination general test or the Miller Analogies Test, and completion of coursework in statistics and research. Applicants whose baccalaureate degree is in a discipline other than nursing are considered. The program of study is individualized based on evaluation of competency statements submitted with the application form. Applicants without a B.S.N. should contact the Graduate Nursing Office for a copy of the competency statement form.

M.S. Degree Requirements

The program for the Master of Science degree includes a total of 42 credit hours for the adult nurse practitioner/clinical nurse specialist, 45 credit hours for the family nurse practitioner specialty, and a minimum of 30 credit hours for the clinical nursing track. All tracks are designed to be completed in 3–4 semesters of full-time study. Individual plans of study are available for those wishing to pursue part-time study. The program of study is designed as follows:

All master's degree students complete the following nine credits of core courses: N900, The Discipline of Nursing; N901, Nursing and Changing Health Services; N905, Research in Nursing. Specialty courses for their chosen track of study are as follows:

Speciality courses (15–27 credits): Courses required for each area of specialization include for adult nurse practitioner/clinical nurse specialist: 907, Pharmacology; 908, Clinical Application of Human Physiology; 909, Health and Illness Appraisal; 935, Primary Care of the Adult; 936, Practicum in Primary Care of Adults (168 clinical hours); 941, Population-Focused Practicum (112 clinical hours); 945, Clinical Decision Making in Health Care; 946, Practicum in Adult Health Care (336 clinical hours). For family nurse practitioner: 907, Pharmacology; 908, Clinical Application of Human Physiology; 909, Health and Illness Appraisal; 935, Primary Care of the Adult; 936, Practicum in Primary Care of Adults (168 clinical hours); 937, Primary Care of Children; 938, Practicum in Primary Care of Children(112 clinical hours); 939, Seminar and Practicum in Primary Care of Families (336 clinical hours). One elective must be a family cognate course. For clinical nursing track: 945, Clinical Decision Making in Health Care; 950, Reading and Research in Advanced Nursing; 955, Practicum in Advanced Nursing Practice (112 clinical hours), support courses (6 credits).

Master's thesis (6 credits) or master's research project (3 credits):
A student may elect either a thesis or non-thesis option. A formal presentation of the completed project or thesis is required. Clinical nursing students complete a rigorous investigation and outcomes-focused analysis of a clinical question in either a project or thesis format.

Research and Scholarly Activities

The graduate faculty of the University's nursing program believe learning is a creative process wherein students are active participants in their education, growth, and development as advanced practice nurses. Faculty members are facilitators and mentors to students within a supportive scholarly environment. Students are prepared to be skilled, knowledgeable, and reflective leaders in health care who practice as nurse practitioners, clinical nurse specialists, or clinical nursing leaders.

The generation, dissemination, and application of evidence-based nursing knowledge and practice is a central mission for the nursing department. Health care of vulnerable populations is the research focus among the faculty. Faculty engage in scholarly inquiry across diverse topics such as care-giving, violence identification and prevention, breastfeeding, adolescent pregnancy, elder care giving, and cultural diversity. Faculty publications, research, public policy initiatives, and other consultative/professional activities can be viewed at the department's Web site at www.unh.edu/nursing.

Resources (labs, centers, partnerships)

The Nursing Resource Center in Hewitt Hall provides a multimedia center supporting didactic and simulated clinical experiences designed to enrich the learning of graduate students. Students have access to more than 500 media, computer-assisted instruction, and interactive video resources and Web access.

Clinical practicum experiences engage graduate students in real-life problem-solving with expert clinician preceptors. Adjunct faculty are found in settings ranging from rural health centers to large urban hospitals. Graduate faculty engage in practice, service and scholarship with partners such as the New Hampshire Area Health Education Center, the New Hampshire Minority Health Coalition, the Dartmouth/Northern New England COOP Project: A Primary Care Research Network, and other clinical facilities and organizations around the state.

International study opportunities are available for graduate students through faculty activities in a variety of countries such as Belize, Wales, England, and Norway.

Opportunities for Graduates

Students completing the master's in nursing have a broad range of opportunities. The program prepares them for direct care or systems practice at an advanced level. They may take positions as nurse practitioners, clinical nurse specialists or clinical nursing leaders in nursing education, staff development or administration caring for individuals, families, groups or communities. Also, students may continue on to doctoral study.

Courses

810	Families in Health and Illness	3 cr.
894	Special Topics	1 to 4 cr.
898	Master's Research Project	3 cr.
899	Master's Thesis	6 cr.
900	The Discipline of Nursing	3 cr.
901	Nursing and Change in Health Services	3 cr.
905	Research in Nursing	3 cr.
907	Pharmacology	3 cr.
908	Clinical Application of Human Physiology	3 cr.
909	Health and Illness Appraisal	3 cr.
920	Administrative Theories in Nursing	3 cr.
921	Administrative Context for Quality Nursing Care Delivery	3 cr.
922	Resource and Financial Management in Nursing	3 cr.
929	Practicum and Seminar in Nursing Administration	6 cr.
935	Primary Care of the Adult	3 cr.
936	Practicum in the Primary Care of Adults	3 cr.
937	Primary Care of Children	3 cr.
938	Practicum in the Primary Care of Children	3 cr.
939	Seminar and Practicum in the Primary Care of Families	6 cr.
941	Population-Focused Practicum	3 cr.
945	Clinical Decision Making in Health Care	3 cr.
946	Practicum in Adult Health Care	6 cr.
950	Reading and Research in Advanced Nursing	2 to 8 cr.
955	Practicum in Advanced Nursing Practice	3 to 6 cr.
994	Special Topics	1 to 3 cr.
996	Independent Study	1 to 3 cr.

Occupational Therapy (OT)

Associate Professors: Elizabeth L. Crepeau, Lou Ann Griswold, Alice C. Seidel, Barbara Sussenberger, Judith D. Ward
Assistant Professors: Shelley E. Mulligan, Barbara Prudhomme White

Degree Offered

The Department of Occupational Therapy offers the master of science degree in occupational therapy. There are two master's degree tracks, a **Professional Master's Track** and a **Post-Professional Master's Track**. The Professional Master's Degree Track prepares students to enter the profession. The Post-Professional Master's Degree Track advances the knowledge and skills for certified occupational therapists, who already hold an entry-level degree in occupational therapy.

Professional Master's Degree Track

The Professional Master's Degree Track prepares students for entry-level occupational therapy practice. Students gain the knowledge and skills to work with people of all ages to enable their participation within their natural environments and daily life activities, including education, work, self-care, home management, and leisure.

The entry-level Professional Master's Degree Track is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE). ACOTE is located at the American Occupational Therapy Association, 4720 Montgomery Lane, P.O. Box 31220, Bethesda, MD 20824-1220. ACOTE's telephone number is (301) 652-2682.

Graduates from an accredited program are eligible to sit for the Certification Examination for the Occupational Therapist administered by the National Board for Certification in Occupational Therapy, Inc. (NBCOT). After successful completion of this exam, the individual will be an occupational therapist, registered (OTR). Most states require licensure in order to practice, however state licenses are usually based on the results of the NBCOT Certification Examination.

Admission Requirements
Students may enter the Professional Master's Degree with a bachelor's degree in fields other than occupational therapy. Admission requirements include completion of the following required prerequisites courses:

Human anatomy and physiology (two semesters with labs),

- Neurology
- Introductory course in psychology
- Abnormal psychology
- English composition/writing
- Child and adult development (two courses)
- Social science course (e.g., sociology, anthropology, political science)
- Statistics

Applicants need a minimum of 3.00 G.P.A. in the above pre-requisite courses and an overall minimum grade point of 3.00.

Additionally, applicants need to have completed a minimum 40 hours of volunteer hours or work experience in health and human service settings.

Three letters of reference must accompany the application. Two of these must address the applicant's educational abilities/performance. One letter must address the applicant's interpersonal/communications skills as observed in a volunteer or paid employment setting.

Advanced-standing Professional Master's Degree Students
Students who have completed a baccalaureate degree in occupational therapy at UNH as part of a combined B.S./M.S. program will take the first year of the two-year professional master's program as part of their senior year B.S. degree requirements. These students will be identified as advanced-standing students in the professional master's program and will need to complete four additional semesters of coursework, which includes fieldwork, to meet the M.S. degree requirements, courses beginning with OT 883 in the list of required courses below. Students in the combined B.S./M.S. program must apply for admission to the Graduate School to enter into the professional master's degree program. An overall minimum gradepoint of 3.00 and a minimum of 3.00 G.P.A. in pre-requisite courses is required for admission in the master's degree program.

Degree Requirements
The Professional Master's Degree Track requires the completion of 64 graduate-level credits, which includes 19 credits of fieldwork. The program consists of two years (sixsemesters) of professional courses, including summer courses between the two academic years. Required courses include: OT 841, OT 842, OT 851, OT 852, OT 861, OT 871, OT 883, OT 885, 892, OT 865, OT 875, OT 894, and OT 896. Students must earn a minimum of B- in all required courses and receive a passing criterion score on the *American Occupational Therapy Association Fieldwork Evaluation for the Occupational Therapist.* Specific requirements are delineated in the *OT Department Policy and Procedure Manual* that is distributed to all new students. Curriculum review and revision is undertaken annually. The Department of Occupational Therapy works closely with students during academic advising sessions and throughout the academic year. Students are also expected to take an active role in verifying expectations and should check with their departmental advisers each September for updated policies and requirements.

Fieldwork experiences are scheduled in centers that are approved by the department. Students are responsible for

transportation to off-campus fieldwork sites and other community learning experiences and must purchase personal liability insurance for coverage for the practical components of the curriculum. Students are responsible for meeting the health clearances established by their fieldwork sites. Proof of immunizations such as poliomyelitis, rubella, and hepatitis B may also be required. For level II fieldwork, health insurance and a physical examination, including a tuberculin test, are required. After completing both level II fieldwork requirements, graduates will be eligible to sit for the certification examination as described above.

Curriculum Design
Classes will be scheduled during weekdays throughout the day and early evening. Many courses require experiential learning activities which students need to work into their weekly schedules.

Postprofessional Master's Degree Track

Admission Requirements
Applicants for admission must demonstrate the following requirements: (1) a minimum of a baccalaureate degree; (2) current NBCOT or WFOT certification as an OTR; (3) a minimum of one year of working experience as a professional occupational therapist; and (4) successful completion of an undergraduate statistics course. All applicants must complete the Graduate School application, furnish recommendations from three individuals, and provide a recent score on the Graduate Record Examination. Applications are accepted and reviewed for entry into the program throughout the year.

Degree Requirements
The master of science degree in occupational therapy requires the completion of 36 graduate-level credits. Students complete five core courses (18 credits), three courses (12 credits) in a concentration area that reflects the student's professional goals, and a thesis or graduate project (6 credits). Students must earn a minimum of B- in all courses.

Curriculum Design
Courses meet all day Saturday at the University of New Hampshire's Durham campus. A 4-credit course meets for one full day, four times during a semester.

Two-year Degree Sequence
Students may complete the degree in two years by taking two courses each fall and spring semester and two courses during the summer term. Students complete 24 credits the first year and 12 credits the second year.

Three-year Degree Sequence
Students may complete the degree in three years by taking one course each fall and spring semester and one course during the summer term. Students complete 12–16 credits in each of the first two years and eight credits the third year.

Courses

841	Human Occupation I	3 cr.
842	Human Occupation II	3 cr.
851	Mind Body Systems: Neurologically-based Function and Dysfunction	4 cr.
852	Human Movement in Occupations	4 cr.
861	Occupational Therapy: Professional Roles and Principles of Practice	3 cr.
862	Occupational Therapy Evaluation and Intervention I	4 cr.
863	Occupational Therapy Evaluation and Intervention II	4 cr.
865	Occupational Therapy Evaluation and Intervention III	3 cr.
871	Occupation-Based Program Development in the Community I	2 cr.
872	Occupation-Based Program Development in the Community II	2 cr.
875	Systems in Occupational Therapy Practice	3 cr.
883	Introduction to Research	3 cr.
885	Engagement in Research	3 cr.
892	Level I Fieldwork	1 cr.
893	Special Topics	2 to 4 cr.
894	Level II Fieldwork I	9 cr.
895	Reading and Research in Occupational Therapy	2 to 4 cr.
896	Level II Fieldwork II	9 cr.
897	Graduate Project	4 cr.
898	Capstone	2 cr.
899	Master's Thesis	6 cr.
901	Theoretical Practice of Occupational Therapy	4 cr.
902	Statistics for Occupational Therapists	4 cr.
903	Research Methods for Occupational Therapists	4 cr.
904	Health Care Trends and Occupational Therapy	4 cr.
911	Clinical Reasoning	4 cr.
912	Occupational Therapy Education	4 cr.

Ocean Engineering (OE)

Professors: Kenneth C. Baldwin, Jean Benoit, Barbaros Celikkol, Pedro A. de Alba, David L. Gress, Nancy E. Kinner, Larry A. Mayer, Kondagunta Sivaprasad, M. Robinson Swift, Colin Ware
Adjunct Professors: Capt. Andrew Armstrong, Jim Gardner, Lloyd Huff, Dave Wells
Associate Professors: Thomas P. Ballestero, Allen D. Drake
Research Associate Professor: Lee Alexander

Degree Offered

Ocean Engineering offers programs leading to the Master of Science and an option in the Doctor of Philosophy degree program in engineering. Programs in OE are by definition interdisciplinary and require the students to interact with the ocean science community as well as the traditional engineering disciplines. Students are exposed to the broad-based issues of working engineering problems in the ocean environment, as well as discipline specifics. In these programs they will be trained to develop responsible solutions to problems that will lead to sustainable activity and life in the ocean.

A Master of Science in Ocean Engineering option in ocean mapping is also available. There is a more structured path through this program, which incorporates all aspects of hydrography as required by the International Hydrographic Organization (IHO) and is approved by the IHO. Focus is on the engineering aspects of hydrography. The general purpose of these programs is to prepare engineering students for professional careers in ocean-related fields.

Admission Requirements

Applicants should have completed a baccalaureate degree in either chemical, civil, electrical, or mechanical engineering or have an equivalent background.

M.S. Degree Requirements

Each student is required to take an oceanography course: ESCI 852, Chemical Oceanography, or ESCI 858, Introductory Physical Oceanography, or ESCI 859, Geological Oceanography, or ZOOL 850, Biological Oceanography, and OE 990, 991, Ocean Engineering Seminar I, II. In addition, each student must select three of the following seven courses: OE 871 Geodesy and Positioning, OE 881, Physical Instrumentation; OE 810, Ocean Measurements Laboratory; OE 853, Ocean Hydrodynamics; OE 854, Ocean Waves and Tides; OE 885, Underwater Acoustics; and ESCI 959, Data Analysis Methods in Ocean and Earth Sciences. Students are also required to take a minimum of 12 credits of additional coursework and complete a master's thesis for six credits.

Ocean Mapping Option
This option is offered in conjunction with the Joint Hydrographic Center/Center for Coastal and Ocean Mapping. Each student is required to take these core courses: ESCI 858, Physical Oceanography; OE 990, 991, Ocean Engineering Seminar I and II; OE 810, Ocean Measurements Lab; OE 885, Underwater Acoustics; OE/ESCI

870, Introductory Hydrography; OE/ESCI 871, Geodesy and Positioning; and OE/ESCI 972, Hydrographic Field Course. In addition, each student must select at least six additional credits from these electives: OE 854, Ocean Waves and Tides; ESCI 859, Geological Oceanography; ESCI 959, Data Analysis Methods in Ocean and Earth Sciences; OE 954, Ocean Waves and Tides II; ESCI 907, Geostatistics; OE/ESCI 973, Seafloor Characterization; OE/CS 867, Special Topic (Interactive Data Visualization); EOS 824, Introduction to Ocean Remote Sensing; NR 857, Photo Interpretation and Photogrammetry; NR 860, Geographic Information Systems in Natural Resources; OE 995, Graduate Special Topics; OE 998, Independent Study. Students are also required to complete a master's thesis for six credits. Other related courses may be taken with approval.

Ph.D. Option

Students admitted to this Ph.D. option come from traditional engineering degree programs, physics, mathematics, computer science, and in come cases marine science programs. Those entering the Ph.D. option with a B.S. degree from an engineering program should be prepared to directly enter the Ph.D. option. Those coming from a B.S. in physics, mathematics, or computer science will have their transcripts more carefully reviewed on an individual basis, as additional courses may be required.

A student in the ocean engineering option in the Engineering Ph.D. program will be expected to take a minimum of 12 courses (exclusive of dissertation research) beyond those required for a B.S. degree.

Required Courses

One course in oceangraphy or ocean science
ESCI/ZOOL 850, Biological Oceanography; ESCI 852, Chemical Oceanography; ESCI 858, Introductory Physical Oceanography or ESCI 860, Introductory Dynamical Oceanography; ESCI 859, Geological Oceanography.

Three core courses in ocean engineering
OE 810, Ocean Measurements Lab; OE 844, Corrosion; OE 853, Ocean Hydrodynamics; OE 854, Ocean Waves and Tides; OE 856, Principles of Naval Architecture and Model Testing; OE 857, Coastal Engineering and Processes; OE 881, Physical Instrumentation; OE 885, Underwater Acoustics; OE 873, Seafloor Characterization; OE 870, Introduction to Hydrography; OE 871, Geodesy and Geomatics; OE 872, Hydrographic Field Course.

Two courses in advanced OE topics
(Two at 900 level): OE 937, Advanced Hydrodynamics; OE 954, Ocean Waves and Tides II; OE 956, Dynamics of Moored Systems; ESCI 959, Data Analysis Methods in Ocean and Earth Sciences. Two courses (one at the 800 level; one at the 900 level): MATH 845, MATH 846, Foundations of Applied Mathematics; MATH 853, Introduction to Numberical Methods; MATH 854, Introduction to Scientific Computing; MATH 856, Principles of Statistical Inference; MATH 888, Complex Analysis; MATH 931, MATH 932, Mathematical Physics ; ME 881, Mathematical Methods in Engineering Science I; ME 982, Mathematical Methods in Engineering Science II; ME 876, Introduction to Finite Element Analysis; ME 986 Advanced Finite Element Analysis.

Four electives
(Two at 800 level; two at 900 level): CS 867, Interactive Data Visualization; ME 807, Analytical Fluid Dynamics; ME 809, Computational Fluid Dynamics; ME 886, Introduction to Finite Element Analysis; ME 909, Viscous Flow; ME 910, Turbulent Flow Analysis; ME 911, Theory of Hydrodynamic Stability; ME 827, Advanced Mechanics of Solids; ME 824, Introduction to Vibration; ME 823, Advanced Dynamics; ME 922, Continuum Mechanics; ME 924, Elasticity; ME 926, Plasticity; CIE 861, Foundation Engineering; CIE 862 Introduction to Geotechnical Earthquake Engineering; CIE 863 Geological Engineering; CIE 883 Matrix Structural Analysis and Modeling; CIE 942 River Mechanics; CIE 961, *In situ* Geotechnical Testing; ESCI 907, Geostatistics; ESCI 958, Dynamical Oceanography; ECE 814, Introduction to Digital Signal Processing; ECE 817, Introduction to Digital Image Processing; ECE 845, Acoustics; ECE 857 Fundamentals of Communincation; ECE 860 Introduction to Fiber Optics; ECE 939, Statistical Communication Theory; ECE 940, Information Theory; ECE 941, Digital Signal Processing; ECE 955, Estimation and Filtering; ECE 965, Introduction to Pattern Recognition; ECE 970, Introduction to Optical Signal Processing.

The general progress of a student through this option is expected to follow the time frame listed:

Year 1: Coursework, qualifier at the end of the year
Year 2: More coursework, thesis proposal presentation at the end of the year
Year 3: Research
Year 4: Research/thesis defense
Year 5: Research/thesis defense

The course selection and sequencing will be established in consultation with the student's guidance committee. There will be a qualifying examination on the student's specific area of interest after the first year, but no later than the end of the second year. The goal of this exam is to test the breadth of a student's knowledge in topic areas essential to ocean engineering and the student's area of interest. For each student there will be a list of "must know" topics; i.e., physical oceanography, underwater acoustics, fluid dynamics, mathematics. A formal Ph.D. proposal will then be written and presented in a seminar, which constitutes an oral exam. After successful completion, the student will be advanced to candidacy and work on the dissertation. The dissertation will be defended in a public forum when completed.

Courses

810	Ocean Measurements Laboratory	4 cr.
844	Corrosion	4 cr.
854	Ocean Waves and Tides	4 cr.
856	Principles of Naval Architecture and Model Testing	4 cr.
857	Coastal Engineering and Processes	3 cr.
867	Interactive Data Visualization	3 cr.
870	Introductory Hydrography	3 cr.
871	Geodesy and Positioning for Ocean Mapping	3 cr.
885	Underwater Acoustics	4 cr.
895	Special Topics in Ocean Engineering	2 to 4 cr.
899	Master's Thesis	6 cr.
944	Nonlinear Control Systems	4 cr.
954	Ocean Waves and Tides II	4 cr.
956	Dynamics of Moored Systems	4 cr.
972	Hydrographic Field Course	4 cr.
973	Seafloor Characterization	3 cr.
990	Ocean Seminars I	1 cr.
991	Ocean Seminars II	1 cr.
995	Graduate Special Topics	2 to 4 cr.
998	Independent Study	1 to 4 cr.
999	Doctoral Research	

Painting (ARTS)

Professors: David S. Andrew, Grant Drumheller, Scott Schnepf, David R. Smith, Mara R. Witzling
Associate Professors: Patricia A. Emison, Eleanor M. Hight, Craig A. Hood, Jennifer K. Moses, Langdon C. Quin
Assistant Professor: Brian W. K. Chu

Degree Offered

The Department of Art and Art History offers a program of courses leading to a Master of Fine Arts degree in painting.

Admission Requirements

A bachelor of fine arts degree in painting or the equivalent in undergraduate coursework (minimally this would mean 60 credit hours in studio art and 16 credit hours in art history) is required for admission to this program. Additionally, a minimum undergraduate G.P.A. of 2.6 is required. Prospective students must submit 20 slides of recent work to be reviewed by the graduate faculty of the Department of Art and Art History.

M.F.A. Degree Requirements

Each student in the Master of Fine Arts degree in painting program shall complete 60 credit hours of work. Twenty-eight credits of work will be in the area of concentration (painting) leading toward a thesis exhibition. Sixteen credits will be graduate-level drawing. Eight credits will be in graduate-level art history and the final eight credits will be in art electives to be chosen from drawing, printmaking, painting and/or art history. Along with the thesis exhibition, degree candidates will be required to submit a short written statement focusing on aesthetic, technical and historical issues related to the students' own work.

Courses

832	Advanced Drawing	4 cr.
846	Advanced Painting	4 cr.
884	Dutch Genre Painting	4 cr.
886	European Colonialism and Visual Culture	4 cr.
895	Methods of Art History	4 cr.
897	Seminar in Art History	4 cr.
932	Graduate Drawing	6 cr.
996	Graduate Independent Study in the Visual Arts	1 to 6 cr.
998	Graduate Painting Seminar	6 cr.

Physics (PHYS)

Professors: Roger L. Arnoldy, L. Christian Balling, John R. Calarco, Edward L. Chupp, John F. Dawson, Olof Echt, Jochen Heisenberg, F. William Hersman, Joseph Hollweg, Richard L. Kaufmann, Robert H. Lambert, Martin A. Lee, Eberhard Möbius, James M. Ryan, Harvey K. Shepard, Robert E. Simpson, Roy B. Torbert, John J. Wright
Research Professors: Terry Forbes, Philip A. Isenberg
Associate Professor: Dawn C. Meredith
Research Associate Professors: David J. Forrest, Antoinette B. Galvin, Lynn M. Kistler, Kristina A. Lynch, Mark L. McConnell, Jack M. Quinn
Assistant Professor: Karsten Pohl
Research Assistant Professors: Maurik Holtrop, Mark B. Leuschner

Degrees Offered

The Department of Physics offers the degrees of master of science and the doctor of philosophy. Areas of specialization are space physics and astrophysics, nuclear physics, solid-state physics, and nonlinear dynamical systems.

Admission Requirements

Applicants to the master of science and doctor of philosophy programs are expected to have a bachelor's degree in science, with at least 24 credits in physics and closely allied fields.

M.S. Degree Requirements

The courses required for the master of science in physics include 805, 931, 939, 941, and 943. Students in the M.S. program are not required to take the Ph.D. qualifying examination. Students may select one of the following plans:

1) complete 30 semester hours of courses chosen in consultation with the graduate adviser;

2) complete 24 semester hours of courses chosen in consultation with the graduate adviser, complete a thesis representing the equivalent of 6 semester hours' work, and pass an oral examination on the thesis.

Ph.D. Degree Requirements

The courses required for a doctor of philosophy degree in physics are (1) 805, 931–932, 935, 939, 941–942, 943–944, either 940, 953 or 955; and (2) any additional four courses at the 900 level, excluding 969, 978, 979, 989, and 999. With appropriate additional work, a student may petition to receive credit for one of the following courses: PHYS 810, 812, 818, 820, or 851.

For students doing Ph.D. research in astrophysics or space physics, one of the four elective courses must be PHYS 951; 952 is also highly recommended. These students must also take either 810 or 812 and three semesters of EOS 901 seminar.

Admission to candidacy for the degree is based primarily on demonstrated ability in formal coursework; experience in teaching, equivalent to at least half time for one year; and passing a written qualifying examination. This examination is normally taken during the second year and must be passed by the end of the third year. Upon completion of a dissertation, doctoral candidates will take an oral examination based on the area of their research.

Interdisciplinary Research

The department encourages research in areas related to physics or applied physics. Should students desire to do research in a field related to physics, special provisions may be made. A cooperative program with the Department of Electrical and Computer Engineering is available to master's students in physics. Physics students specializing in space science may complete M.S. or Ph.D. theses under the guidance of professors or research professors in the Institute for the Study of Earth, Oceans, and Space (EOS). (See the listing for EOS in this catalog.) Contact the department chairperson or graduate adviser for details.

Courses

805	Experimental Physics	4 cr.
810	Introduction to Astrophysics	4 cr.
812	Physics of the Ionosphere	4 cr.
818	Introduction to Solid-State Physics	4 cr.
820	Nuclear Physics	4 cr.
854	Introduction to Scientific Computing	3 cr.
895	Independent Study	1 to 8 cr.
899	Master's Thesis	6 cr.
901	Physics Teaching Seminar	1 cr.
931	Mathematical Physics	3 cr.
932	Mathematical Physics	3 cr.
935	Statistical Physics	3 cr.
939	Theoretical Mechanics I	3 cr.
940	Theoretical Mechanics II	3 cr.
941	Electromagnetic Theory	3 cr.
942	Electromagnetic Theory	3 cr.
943	Quantum Mechanics	3 cr.
944	Quantum Mechanics	3 cr.
951	Plasma Physics I	3 cr.
952	Plasma Physics II	3 cr.
953	Solar Magnetohydrodynamics	3 cr.
954	Solar Wind and Cosmic Rays	3 cr.
955	Geophysical and Astrophysical Fluid Dynamics	3 cr.
961	Advanced Quantum Mechanics	3 cr.
962	Advanced Quantum Mechanics	3 cr.
965	Advanced Solid State Physics	3 cr.
987	Magnetospheres	3 cr.
988	High Energy Astrophysics	3 cr.
995	Special Topics	1 to 3 cr.
999	Doctoral Research	

Profile

Ignacio L. Ramirez

Ph.D. candidate, Sociology
Cognate in College Teaching

Lisa Nugent

"I did my research along the Mexico border. Among other things, I'm looking at acculturation — whether family violence increases or decreases among people coming from Mexico to the U.S."

A chance to work with internationally known researchers is one of the reasons Luis Ramirez chose the University of New Hampshire for his Ph.D. in sociology.

"I read about the faculty and the department's Family Research Laboratory while I was working on my master's degree in Texas," he says. Ramirez, whose parents moved to El Paso from Mexico before he was born, is fluent in both English and Spanish; at UNH he is completing a cross-cultural study.

"My research has expanded into a multinational comparison of family violence and possible predictors of violence, such as personal history, integration into society, and violence approval," he explains.

Ramirez is finishing his Ph.D. in four years, which is below the norm. He has been supported by the department with teaching assistantships in sociology, criminology, and statistics, as well as research assistantships and tuition waivers. "I can't say enough about how good they've been to me," Ramirez says. "I was on the job market this year and everywhere I went they said, 'so, you worked for Murray Straus.'"

Plant Biology (PBIO)

Professors: Robert O. Blanchard, Garrett E. Crow, Curtis V. Givan, J. Brent Loy, Arthur C. Mathieson, Subhash C. Minocha
Adjunct Professor: Walter C. Shortle
Associate Professors: Alan L. Baker, Thomas M. Davis, Wayne R. Fagerberg, Leland S. Jahnke, Anita S. Klein, Thomas D. Lee, Christopher D. Neefus, James E. Pollard, John M. Roberts
Adjunct Associate Professors: Rakesh Minocha, Kevin T. Smith, Janet R. Sullivan
Assistant Professors: Paul R. Fisher, Estelle M. Hrabak, Dean A. Kopsell, Stefan Seiter

Degrees Offered

The Department of Plant Biology offers the master of science and doctor of philosophy degrees. Research opportunities are available in basic and applied areas of plant biology, including breeding and genetics, cell biology, cell and tissue culture, ecology, molecular biology, genetic engineering, marine and freshwater biology, morphology and anatomy, pathology, phycology, physiology, systematic botany, crop production, and environmental horticulture.

The plant biology faculty and graduate student offices and research labs are housed in two buildings on the main campus: Spaulding Life Sciences and Rudman Hall. Both are modern buildings with state-of-the-art labs and teaching facilities. The department maintains a herbarium collection of vascular plants and marine macroalgae numbering about 2,000 specimens. In addition to a strong terrestrial field ecology/systematic program, there is considerable strength in freshwater ecology, and the department contributes to the programs of the Center for Freshwater Biology. It is also partnered with the Jackson Estuarine Laboratory, located five miles from campus on the Great Bay Estuary, where our faculty conduct research in estuarine and marine studies.

The department also operates two University owned farms where field experiments are conducted. The Woodman Farm is located less than a mile from the main campus and consists of fields for vegetable crops and apple orchards. The Kingman Farm, two miles from campus, is also dedicated to agricultural research and has a large composting facility.

The department's five greenhouses are located at the edge of campus within easy walking distance of Rudman and Spaulding and are important facilities for research in environmental horticulture and plant breeding.

Admission Requirements

Applicants are expected to have adequate preparation in plant biology and in the physical sciences; they must also submit general scores from the Graduate Record Examination.

M.S. Degree Requirements

Students will meet the Graduate School's requirements for the degree (minimum of 30 credits). Students will be required to write and defend a thesis (6–10 credits) based on field or laboratory research.

Ph.D. Degree Requirements

Students will complete a program of study as determined by their guidance committee. Students will be advanced to candidacy after successfully completing comprehensive written and oral qualifying examinations. Candidates must successfully defend a dissertation based on original research in plant biology. For some program areas, a foreign language may be required at the discretion of the student's guidance committee.

Teaching Requirements

Teaching experience is required of all M.S. and Ph.D. degree students. The requirement may be fulfilled by enrolling in a supervised teaching course, by serving as a teaching assistant, or by having previous professional teaching experience.

Courses

801	Plant Physiology	3 cr.
802	Plant Physiology Laboratory	2 cr.
806	Weed Ecology	2 cr.
808	Weed Ecology and Management Lab	2 cr.
809	Plant Stress Physiology	3 cr.
811	Plant Cell Biochemistry	3 cr.
813	Photosynthesis	4 cr.
814	Electron Microscopy	2 cr.
815	Electron Microscopy Lab	3 cr.
817	General Limnology	4 cr.
819	Field Limnology	4 cr.
821	The Microscopic Algae	4 cr.
822	Marine Phycology	4 cr.
824	Freshwater Algal Ecology	4 cr.
825	Marine Ecology	4 cr.
826	Integrated Pest Management	4 cr.
827	Algal Physiology	3 cr.
829	Algal Physiology Laboratory	2 cr.
840	Agroecology	4 cr.
842	Physiological Ecology	4 cr.
844	Vegetation Sampling and Analysis	4 cr.
845	Community Ecology	4 cr.
847	Aquatic Higher Plants	4 cr.
851	Cell Culture	5 cr.
852	Mycology	4 cr.
853	Cytogenetics	4 cr.
854	Lab Molecular Biology of Nucleic Acids	5 cr.
858	Plant Anatomy	5 cr.
866	Plant-Microbe Interactions	3 cr.
874	Plant Biotechnology and Genetic Engineering	3 cr.
875	Plant Biotechnology and Genetic Engineering Lab	2 cr.
899	Master's Thesis	6 to 10 cr.
985	Advanced Topics in Plant Biology	1 to 6 cr.
995	Investigations in Plant Biology	1 to 6 cr.
997	Graduate Seminar	1 cr.
999	Doctoral Research	

Political Science (POLT)

Professors: Marilyn Hoskin, B. Thomas Trout
Associate Professors: Marla A. Brettschneider, Warren R. Brown, John R. Kayser, Aline M. Kuntz, Susan J. Siggelakis, Clifford J. Wirth
Assistant Professors: Todd A. Eisenstadt, Clark R. Hubbard, Daniel R. Krislov, Lawrence C. Reardon, Bernard T. Schuman, Stacy D. VanDeveer, J. Mark Wrighton

Degrees Offered

The Department of Political Science offers the master of arts in political science and the master of public administration degrees. Areas of specialization for the master of arts are political thought, American politics, comparative politics, and international politics. The M.P.A. program is offered in Durham and Manchester.

Admission Requirements

Applicants are expected to have majored in political science, a related field, or have worked in government or the nonprofit sector. Where undergraduate preparation has been insufficient, applicants may be admitted provided that they follow a program of study approved by the chairperson. The Graduate Record Examination general test is required for the M.A.; either the Graduate Record Examination general test or the Graduate Management Admission Test is required for the M.P.A.

M.A. Degree Requirements

The M.A. in political science is available to full- and part-time students. The program has three goals: to assure familiarity with the breadth of the discipline; to provide training in research techniques; and to allow each candidate an opportunity to develop special familiarity with a particular field. Accordingly, the M.A. program in-

cludes a master's thesis and the following course-related requirements: one advanced course or seminar in each of the four fields offered by the department; two additional advanced courses or seminars offered by the department or in a related discipline; one advanced course in research techniques and methods (POLT 905 or equivalent); and the master's thesis in the selected field of concentration. Each candidate must complete seven courses or seminars (26–28 credits) and the thesis (8 credits) for a total of 34–36 credits.

Master of Public Administration Degree Requirements

The master of public administration is an interdisciplinary degree designed principally for individuals intending to pursue careers in local, state, or national government service in the U.S. or other countries. Students will be required to complete eight full courses (30–32 credits) and a 4-credit internship program (POLT 970, Administrative Internship) for a total of 34–36 credits. A comprehensive examination is required.

Of the eight courses, three are required core courses (POLT 905, 906, 907), two are elective courses in public administration and political science, and three may be selected from other departments in related fields, including administration, health management and policy, political science or resource economics, community development, and others.

Students who have had appropriate responsibility in public administration may be exempted from the internship upon petition for such exemption. Such students will be required to undertake independent research on an approved topic related to public administration (POLT 995 or 996, 4 credits).

The program is offered for full- and part-time students. The full-time program can be completed during one academic year. The part-time program, designed for working professionals, can be completed during late afternoon or evenings over two and one-half years.

Courses

801	The Courts and Public Policy	4 cr.
802	Public Planning and Budgeting	4 cr.
803	Urban and Metropolitan Politics	4 cr.
804	Policy and Program Evaluation	4 cr.
843	Comparative Political Economy	4 cr.
862	International Political Econ	4 cr.
878	International Organization	4 cr.
897B	Seminar in American Politics	4 cr.
897C	Seminar in Comparative Politics	4 cr.
897E	Seminar in International Politics	4 cr.
897F	Seminar in Public Administration	4 cr.
897I	Seminar in Political Thought	4 cr.
898B	Seminar in American Politics	4 cr.
898C	Seminar in Comparative Politics	4 cr.
898E	Seminar in International Politics	4 cr.
898F	Seminar in Public Administration	4 cr.
898I	Seminar in Political Thought	4 cr.
899	Master's Thesis	8 cr.
905	Methods of Policy Analysis	4 cr.
906	Theories and Processes of Public Administration	4 cr.
907	Cases in Public Management	4 cr.
970	Administrative Internship	4 cr.
995	Reading and Research in Political Science	1 to 4 cr.
996	Reading and Research in Political Science	1 to 4 cr.

Psychology (PSYC)

Professors: Victor A. Benassi, Ellen S. Cohn, Peter S. Fernald, Kenneth Fuld, Benjamin Harris, Robert G. Mair, John D. Mayer, Edward J. O'Brien, Rebecca M. Warner, William R. Woodward
Associate Professors: Victoria L. Banyard, Robert C. Drugan, John E. Limber, Carolyn J. Mebert, Suzanne Mitchell, William Wren Stine, Elizabeth A. L. Stine-Morrow, Daniel C. Williams
Research Associate Professor: Daniel G. Morrow
Assistant Professor: Amy L. Odum
Research Assistant Professor: Timothy A. Shahan

Degree Offered

The Department of Psychology offers a four-year program of study leading to the doctor of philosophy degree. The basic goal of the program is the development of behavioral scientists who have a broad knowledge of psychology, who can teach and communicate effectively, and who can carry out sound research in an area of specialization. Although some students seek employment outside academia, the program is oriented toward developing the skills required by the research psychologist who intends to become a college or university teacher.

Areas in which the student may specialize are cognition and psycholinguistics, developmental psychology, the history and theory of psychology, behavior analysis, physiological psychology, sensation and perception, and social/personality psychology. The department does not offer training in clinical or counseling psychology.

Distinctive Features of the Program

All psychology graduate students in the Ph.D. program receive a stipend and a full tuition waiver for at least four years. A low graduate student/faculty ratio provides opportunities to work closely with one or more faculty mentors. Graduates acquire tenure-track academic, or post-doctoral positions at colleges and universities across the U.S.

The Department of Psychology is a national model for preparing future faculty. All graduate students teach Introduction to Psychology autonomously, as well as one or two undergraduate survey courses in statistics and/or in the student's area of specialization. In addition, through a partnership with the University's Preparing Future Faculty program, students may simultaneously earn a Master of Science for Teachers or a Cognate in Collge Teaching.

The UNH Department of Psychology is the only program in the United States that offers a Ph.D. in the History of Psychology. In addition, there are active research laboratories in all areas represented in the graduate program. The department has strong partnerships with such nationally recognized programs as UNH's Child Study and Development Center and the Family Research Laboratory. UNH also has a Teaching Excellence Program to help graduate students and faculty improve the quality of their teaching.

Admissions Requirements

In addition to meeting the requirements for admission to the Graduate School, applicants must intend to be full-time students working toward the doctoral degree (not just the master's degree), and they must submit Graduate Record Examination general test scores and the score on the subject test in psychology along with other standard application forms, which may be obtained from the department. Before beginning graduate work, the applicant must have completed a minimum of 15 undergraduate credits in psychology, including courses in elementary statistics and experimental psychology.

Ph.D. Degree Requirements

Required courses include two semesters of the graduate proseminar (PSYC 901-902), three semesters of research methodology and statistics (PSYC 905-906; 907 or 908), eight graduate seminars, and two semesters of the practicum and seminar in the teaching of psychology (PSYC 991-992). Work outside the department is also included in each student's program. Depth in a particular area is obtained through par-

ticipation in advanced seminars and by independent reading and research conducted under the supervision of a faculty member. Because topics generally differ each time an advanced seminar is offered, advanced seminars may be repeated for credit.

Prior to the doctoral dissertation, the student carries out original research that culminates in either a master's thesis or a paper of publishable quality. A master's degree is awarded upon the successful completion of a program approved by the department and dean of the Graduate School. This typically takes place by the end of the second year.

The third year of the program is dedicated to the practicum and seminar on the teaching of psychology in conjunction with the teaching of introductory psychology.

Advancement to candidacy for the Ph.D. degree depends on receiving the master's degree, passing a specialist examination in one of the department's areas of specialization, and identifying a topic for doctoral research. Advancement to candidacy is usually accomplished by the end of a student's fourth year in the program. During the fourth year, students typically begin dissertation research and teach an introductory course in their specialty area. Most students complete the Ph.D. degree in the fifth year.

For more details about the graduate program, for applications forms, and for a schedule of course offerings, contact the department and/or visit: www.unh.edu/psychology. Approval of the instructor is required before registering for any graduate course.

Courses

894	Advanced Research in Psychology	4 or 8 cr.
899	Master's Thesis	8 cr.
901	Graduate Proseminar	
902	Graduate Proseminar	
905	Research Methodology and Statisitcs I	4 cr.
906	Research Methodology and Statisitcs II	4 cr.
907	Research Methods and Statisitcs III	4 cr.
909	Advanced Seminar in Quantitative and Analytic Method	4 cr.
914	Advanced Seminar in Cognition	4 cr.
917	Advanced Seminar in Sensory and Perceptual Processes	4 cr.
933	Advanced Seminar in Physiological Psychology	4 cr.
945	Advanced Seminar in Behavioral Analysis	4 cr.
954	Advanced Seminar in Social Psychology	4 cr.
974	Advanced Seminar in the History and Theory of Psychology	4 cr.
982	Advanced Seminar in Developmental Psychology	4 cr.
991	Practicum and Seminar in the Teaching of Psychology	6 cr.
992	Practicum and Seminar in the Teaching of Psychology	6 cr.
995	Reading and Research in Psychology	1 to 4 cr.
998	Problems and Issues in Psychology	4 cr.
999	Doctoral Research	

Resource Administration and Management (RAM)

Professors: John E. Carroll, Russell G. Congalton, Robert T. Eckert, Richard W. England, John M. Halstead, Lawrence C. Hamilton, Theodore E. Howard, Edmund F. Jansen, Jr., Bruce E. Lindsay
Associate Professors: Mimi Larsen Becker, Ju-Chin Huang, Alberto B. Manalo, Richard L. Mills, Douglas E. Morris, Robert A. Robertson, Debra L. Straussfogel
Assistant Professor: Sally W. Jacoby

Degree Offered

The Department of Resource Economics and Development coordinates the interdisciplinary master of science degree program in resource administration and management. Students may specialize in management of publicly and privately owned natural resources or in administration of natural resource laws and policies.

Admission Requirements

Applicants are expected to have completed either an undergraduate degree in the field in which they plan to specialize or show adequate preparation in the basic support courses of the field. A minimum of one course in each of the areas of ecology or natural resources, intermediate microeconomics, and introductory statistics is required. Persons having professional experience in resource administration, management, or related areas receive priority for admittance to the program. An applicant is required to submit an essay of up to 2,000 words describing his or her background and goals.

Applicants with good undergraduate records who lack a background in a particular field may be admitted to a program, provided they are prepared to correct the deficiencies. The Graduate Record Examination general test is required of all applicants.

M.S. Degree Requirements

The master of science degree in resource administration and management is conferred upon successful completion of the following:

1) a program amounting to not less than 34 credits including the following course requirements or equivalent: RAM 993, Seminar, 1 cr.; RAM 903, Approach to Research, 2 cr.; quantitative methods or analytical techniques, 3–4 cr.; RAM 911, Natural and Environmental Resource Management, 4 cr.; RAM 912, Administration of Resource Laws and Policies, 4 cr.; and RAM 898, Directed Research, 4–6 cr., or RAM 899, Thesis, 6–10 cr.;

2) a final oral and/or written examination.

Courses

805	Ecotourism: Managing for the Environment	4 cr.
841	Critical Issues in Solid Waste Management	2 cr.
867	Social Impact Assessment	4 cr.
877	Fundamentals and Practice of Community Planning	4 cr.
896	Investigations in Resource Management and Administration	2 to 4 cr.
898	Directed Research	2 to 6 cr.
899	Master's Thesis	1 to 10 cr.
900	Resource Administration and Management Internship	4 cr.
903	Approach to Research	2 cr.
911	Natural and Environmental Resource Management	4 cr.
912	Administrative Principles and Practices for Resource Systems	4 cr.
993	Natural and Environmental Resources Seminar	1 cr.

Resource Economics (RECO)

Professors: Lyndon E. Goodridge, John M. Halstead, Edmund F. Jansen, Jr., Bruce E. Lindsay
Associate Professors: Alberto B. Manalo, Douglas E. Morris

Degree Offered

The Department of Resource Economics and Development offers the master of science degree in resource economics with specializations in agricultural economics; community and regional economics; land economics; water economics; and environmental economics.

Admission Requirements

Applicants are expected to have completed either an undergraduate degree in the field in which they plan to specialize or show adequate preparation in the basic support courses of the field. Four or more undergraduate courses in economics or resource economics, including intermediate microeconomics and intermediate macroeconomics, are required, as well as calculus and statistics.

Applicants with good undergraduate records who lack background in a particular field may be admitted to a program, provided they are prepared to correct the deficiencies. The Graduate Record Examination general test is required of all applicants.

M.S. Degree Requirements

The master of science degree in resource economics is conferred on successful completion of the following:

1) a program amounting to not less than 30 credits including the following course requirements or equivalent: RECO 993, Seminar, 1 cr.; RECO 903, Approach to Research; ECON 926, Econometrics I, or ECON 927, Econometrics II; RECO 808, Environmental Economics, or RECO 856, Rural and Regional Economic Development; RECO 815, Linear Programming and Quantitative Models; ECON 976, Microeconomics I, or equivalent; and RECO 898, Directed Research, 2–4 cr., or RECO 899, Thesis, 6–10 cr.;

2) a final oral and/or written examination.

Courses

800	Marketing Places	4 cr.
808	Environmental Economics	4 cr.
815	Linear Programming and Quantitative Models	4 cr.
856	Rural and Regional Economic Development	4 cr.
895	Investigations in Resource Economics	2 to 4 cr.
898	Directed Research	2 to 4 cr.
899	Master's Thesis	6 to 10 cr.
903	Approach to Research	2 cr.
911	Natural and Environmental Resource Management	4 cr.
993	Natural and Environmental Resources Seminar	1 cr.

Social Work (SW)

Professor: Jerry Finn
Associate Professors: Mary Banach, Cynthia Anne Broussard, Robert E. Jolley, Jerry D. Marx, Sharyn J. Zunz
Assistant Professors: Linda Rene Bergeron, Angie H. Rice, Patrick Shannon

Degree Offered

The Department of Social Work offers a master of social work (M.S.W.) degree. This program develops advanced professional knowledge and skill for persons interested in pursuing careers in the field of social work.

The M.S.W. program is accredited by the Council on Social Work Education (CSWE). It requires two years of full-time study or three to four years of part-time study. The full-time program is available in Durham only but the part-time program can be taken in Durham or in Manchester (the Manchester part-time program is delivered in a week-end model). All students complete a foundation-year course of study, then elect a second-year concentration either in direct/clinical practice or community/administrative practice. Both concentrations require classroom work and two year-long field internships.

Admission Requirements

The department encourages applications from persons who (1) hold a baccalaureate degree from an accredited college or university; (2) have attained an overall grade-point average of "B" or better in undergraduate coursework; (3) have completed courses in a broad range of liberal arts and science disciplines; (4) have acceptable recommendations from three individuals, one of whom must be a member of an academic faculty; and (5) have completed satisfactorily a personal statement of interest in pursuing graduate education in the field. Though not required, significant volunteer and/or work experience in the field is strongly recommended. Students who do not meet the liberal arts and science expectations may be asked to complete additional coursework prior to or during the first year of their enrollment in the program. Standardized graduate examinations are not required, but results of such tests may be submitted to supplement other admission materials.

Students applying for advanced standing must hold a degree from an accredited B.A. in S.W./B.S.W. program with a minimum grade-point average of 3.2 (4.00 point scale) in social work major requirements. This coursework must have been completed within five years of the date of M.S.W. matriculation. Advanced-standing applicants must also submit a reference from a B.S.W. faculty member and the undergraduate field supervisor or field coordinator.

The M.S.W. program concentrates on strengths and empowerment models that encourage individuals and families to realize their full potential. The department supplies the students with a social and community systems context and promotes practice skills that are responsive to diversity issues. The program is housed in the newly renovated Pettee Hall with access to interview observation rooms and state-of-the-art classrooms and computer labs.

Financial aid opportunities in the department include grants for students interested in the child welfare field or in work with disabled children and their families. The department also offers graduate research assistantships to a few second year students.

Graduates of the program are employed in a wide variety of social and human service agencies as direct practitioners and in managerial roles.

M.S.W. Degree Requirements

An M.S.W. candidate must complete 62 credit hours of 800- or 900-level courses including two, two-semester field internships, comprising a total of 1,100 hours in the field. Although a significant portion of the curriculum is required, students will be able to complete three elective courses. At least one of these must be taken from among Department of Social Work course offerings. Students select a second-year concentration in direct/clinical practice or community/administrative practice. Each concentration requires that three courses and the second-year field internship be completed in the student's area of concentration.

Advance standing students complete a minimum of 35 credits for graduation. This includes a ten-week summer practicum and seminar which students must take prior to their advanced practice and field placement. Additional information may be obtained by contacting the coordinator of graduate admissions in the department office.

Courses

801	Women and Aging	3 cr.
805	Child Welfare: Policies, Programs, and Practice	3 cr.

810	Computer Utilization in Social Work	3 cr.
811	Social Work and Mental Illness	3 cr.
812	Social Work and Developmental Disabilities	3 cr.
814	Introduction to Addiction: Assessment and Intervention	3 cr.
815	Practice with Gay, Lesbian, and Bisexual Clients	3 cr.
820	Social Welfare Policy I	3 cr.
830	Social Work Practice I	3 cr.
831	Social Work Practice II: Practice in Small Groups and Community Organizations	3 cr.
840	Implications of Race, Culture, and Opression for Social Work Practice	3 cr.
850	Human Behavior and the Social Environment I	3 cr.
851	Human Behavior and the Social Environment II	3 cr.
860	Research Methods in Social Work	3 cr.
873	Intervention with Groups	3 cr.
880	Field Internship I	3 cr.
881	Field Internship II	3 cr.
897	Special Topics in Social Work and Social Welfare	3 cr.
900	Advanced Standing Practice and Field Seminar	3 cr.
926	Social Welfare Policy II	3 cr.
932	Direct practice III: Clinical Assessment and Intervention	3 cr.
933	Direct Practice IV: Advanced Clinical Assessment and Intervention	3 cr.
936	Community and Administrative Practice III: Community Organization and Political Strategies	3 cr.
937	Community and Administrative Practice IV: Management of Human Service Organizations	3 cr.
952	HB/SE III: Adaptive and Maladaptive Functioning	3 cr.
957	Program and Resource Development in the Social Service Arena	3 cr.
962	Research II — Statistics	3 cr.
965	Research III: Program and Practice Evaluation	3 cr.
974	Social Work Supervision	3 cr.
975	Theory and Practice of Family Therapy	3 cr.
977	Ego Psychology I	3 cr.
979	Social Work and the Law	3 cr.
982	Field Internship III	4 cr.
983	Field Internship IV	4 cr.
985	Object Relations: Theory and Practice	3 cr.
992	Special Projects and Independent Study	1 to 3 cr.

Sociology (SOC)

Professors: Melvin T. Bobick, David Finkelhor, Lawrence C. Hamilton, Murray A. Straus, Sally Ward
Associate Professors: James Tucker, Heather A. Turner
Assistant Professors: Linda M. Blum, Benjamin C. Brown, Sharyn J. Potter, John B. Strait, Karen VanGundy

Degrees Offered

The Department of Sociology and Anthropology offers M.A. and Ph.D. degrees in sociology. The master's degree program emphasizes theory and methodology. Students in the doctoral program are expected to select from the areas of departmental specialization one major area and one minor area for intensive study and examination. There are five major substantive areas for possible specialization: deviance, conflict, and control; family; social stratification; social policy and applied sociology; and medical sociology. Students may pursue specialties within or across the major areas of specialization or propose to the Graduate Committee other major areas of specialization that fall within the faculty's competence.

Admission Requirements

Applicants must present, in addition to meeting the general Graduate School requirements, Graduate Record Examination scores on the general test (verbal, analytical, and quantitative reasoning sections).

Undergraduate majors in other fields may be admitted. However, if the student's undergraduate work has not included an introductory course in sociological theory, research methods, statistics, and two other sociology courses, these five courses must be taken, or equivalent knowledge demonstrated, in addition to the requirements outlined above.

All students entering the program must complete the M.A. before admission to the Ph.D. program. The department welcomes both applicants who plan to continue for the Ph.D. as well as students planning for the M.A. only.

M.A. Degree Requirements

Students must fulfill the following requirements:

1) Complete satisfactorily at least 26 credit hours of graduate-level coursework in sociology including the Proseminar in Sociology (900, 2 credits); Sociological Methods I (901); either SOC 902, 903, or 904; Sociological Theory I (911); and three elective graduate seminars.

2) Register for one credit of thesis work during the second semester of residence and submit a draft of a proposal to the thesis committee by the end of the semester.

3) Submit for approval a report of a research endeavor to the thesis committee.

4) Register for a total of 6–10 thesis credits.

Ph.D. Degree Requirements

A minimum of three years in residence, and completion of the following:

1) Take a minimum of thirteen courses in sociology (at least eight as seminars) other than thesis or dissertation research, including the Proseminar in Sociology (900, 2 credits), Sociological Theory I and II (911 and 912), Sociological Methods I and II (901 and 902), and one other course in methods or statistics (SOC 903 or 904), three courses in a major area, and two in a minor area of sociology, and two elective courses.

2) Complete a second minor consisting of three related courses whether or not sociological in content (these three courses are in addition to the thirteen required courses in sociology); no preliminary examination is required.

3) Pass written examinations in the major and minor areas of sociological specialization and in advanced theory and methodology.

4) Demonstrate reading-level proficiency in a foreign language or a research tool appropriate to the overall program of the student.

5) Write and defend the doctoral dissertation.

Courses

830	Political Sociology	4 cr.
835	Complex Organizations	4 cr.
860	Aging and Late Life Family	4 cr.
880	Social Conflict	4 cr.
890	Applied Sociology	4 cr.
892	Research Internship	4 cr.
894	Evaluation of Social Programs	4 cr.
897	Special Topics in Sociology	4 cr.
899	Master's Thesis	6 to 10 cr.
900	Proseminar in Sociology	2 cr.
901	Sociological Methods I: Intermediate Social Statistics	4 cr.
902	Sociological Methods II: Research Design	4 cr.
903	Sociological Methods III: Special Problems in Methods and Statistics	4 cr.
904	Sociological Methods IV	4 cr.
911	Sociological Theory I	4 cr.
912	Sociological Theory II	4 cr.
970	Social Stress and Health	4 cr.
975	Sociology of the Family	4 cr.
976	Violence in the Family	4 cr.
980	Social Stratification	4 cr.
988	Medical Sociology: Health, Healing, and Society	4 cr.
990	Teaching Sociology Seminar	4 cr.
995	Reading and Research in Sociology	2 to 8 cr.
996	Reading and Research in Sociology	2 to 8 cr.
997	Advanced Special Topics in Sociology	2 or 4 cr.
999	Doctoral Research	

Profile

Jody Grimes

Ph.D. candidate, Sociology

Lisa Nugent

"My primary interest is in the resources natives and newcomers contribute to the process of community change."

Jody Grimes grew up in Madbury, N.H. where her mother was a selectman and on the planning board, and much town business got done at the kitchen table.

Today, Grimes retains a deep interest in civic engagement in rural communities.

After completing a B.S. in family studies and a master's degree in human services administration, she entered the sociology department's Ph.D. program and began research in a Downeast Maine community she calls "Herring Bay."

"The economy in Herring Bay has been going downhill since the herring industry crashed after World War II," says Grimes. "One of the things the older residents told me about was watching their businesses, local institutions, and young people leave. Today boarded-up buildings are a fairly common sight, and some people have to patch together a living with part-time, seasonal work—digging clams, raking blueberries, fishing, and making Christmas wreaths. But it's incredibly beautiful there—the scenery is just indescribable. The scenery has drawn newcomers, mostly early retirees, to Herring Bay. Both natives and newcomers are actively engaged in civic life, negotiating what to keep of the old ways of doing things and what new ways to adopt."

At UNH, Grimes says she has found "a lot of interest in *my* interest in rural communities," and "tremendous support" from the Graduate School. After the Ph.D., she hopes to work in community development. "I love teaching, I love research, but I also love taking that information directly to communities, to people who can use it."

Spanish (SPAN)

Professor: F. William Forbes
Associate Professors: John M. Chaston, Janet Gold, Lina Lee
Assistant Professors: Carmen Garcia de la Rasilla, Marco Dorfsman, Lori Hopkins, Monica Jato, Alicia Quiroz Woodruff

Degree Offered

The program in Spanish in the Department of Languages, Literatures, and Cultures offers a master of arts degree in Spanish with courses in the following four areas: Medieval and Golden Age literature and culture; Modern Peninsular literature and culture; Latin American literature and culture; and Hispanic linguistics and foreign language pedagogy. The program also supports work in interdisciplinary Hispanic studies.

Admission Requirements

Applicants shall have received a bachelor's degree from an accredited institution with an undergraduate major in Spanish or its equivalent.

M.A. Degree Requirements

To obtain the degree, the candidate must fulfill a minimum of 30 credits. The candidate must also pass a comprehensive examination based on the master's degree reading list.

To satisfy the course requirements, the candidate must:

1) successfully complete ten graduate courses, eight of which should be from the offerings of the Spanish program;

2) take two of the ten courses in allied fields approved by the department;

3) take four of the ten courses as graduate seminars; or

4) write an acceptable thesis may be written in lieu of two courses. If a thesis option is selected, it must embody the results of independent investigation and be written in Spanish in a form acceptable to the Spanish faculty and the Graduate School.

5) In addition, master of arts degree candidates must take Spanish 901 (a one-credit course dealing with bibliography and methods of research) during their first year of study. Graduate assistants teaching in the department must take Spanish 903 (a one-credit course in applied linguistics).

Courses

852	Drama and Poetry of the Siglo de Oro	3 cr.
854	The Age of Cervantes	3 cr.
855	Literature of 19th Century	3 cr.
856	Modern Spanish Poetry	3 cr.
871	Latin American Drama	3 cr.
873	Latin American Short Story	3 cr.
890	Grammatical Structure of Spanish	3 cr.
891	Methods of Foreign Language Teaching—Spanish	3 cr.
897	Special Studies in Spanish Language and Literature	3 cr.
898	Special Studies in Spanish Language and Literature	3 cr.
899	Master's Thesis	6 cr.
901	Bibliography and Methods of Research	1 cr.
903	Applied Linguistics	1 cr.
995	Independent Study	1 to 3 cr.
997	Graduate Seminar	3 cr.
998	Graduate Seminar	3 cr.

Zoology (ZOOL)

Professors: Ann C. Bucklin, John F. Burger, Donald S. Chandler, James F. Haney, Larry G. Harris, W. Huntting Howell, Thomas D. Kocher, Michelle P. Scott, James T. Taylor, Charles W. Walker, Winsor H. Watson III
Adjunct Professors: Arthur C. Borror, Miyoshi Ikawa, John J. Sasner, Edward K. Tillinghast
Associate Professor: Marianne Klauser Litvaitis
Research Associate Professors: Raymond E. Grizzle, Michael Lesser
Assistant Professors: David L. Berlinsky, Jessica A. Bolker, James E. Byers
Research Assistant Professor: Karen L. Carleton
Adjunct Assistant Professor: Richard Langan

Degrees Offered

The Department of Zoology offers the master of science and the doctor of philosophy degrees. Students can specialize in behavior, development, ecology (freshwater, marine, and terrestrial), fisheries, genetics, invertebrate zoology, systematics, entomology, neurobiology, and physiology.

Admission Requirements

Applicants ordinarily must have completed an undergraduate major in biology or zoology. A basic array of courses including general biology, development, general ecology, genetics, morphology, and physiology is normally required. Additionally, organic chemistry and a semester each of calculus and physics are necessary. Applicants who are deficient in any of these requirements may be admitted to graduate status but may be required to remedy their deficiencies by taking courses that do not give graduate credit. Applicants must submit general and subject biology scores from the Graduate Record Examination.

M.S. Degree Requirements

Students plan a program of study (minimum of 30 credits) in conjunction with a faculty advisory committee. Students complete a thesis of 6 to 10 credits that is acceptable to the thesis-examining committee. Prior to the receipt of the master's degree, all candidates must pass a thesis defense, which will include questions covering general knowledge in zoology in addition to specific questions relevant to the student's research at the University of New Hampshire.

Ph.D. Degree Requirements

Students plan a program of study in conjunction with a faculty guidance committee. All doctoral students must pass a written examination to certify their proficiency in one foreign language. After the successful completion of the language requirement and of all required courses, students who wish to be admitted to doctoral candidacy must demonstrate a broad basic knowledge of their major and minor fields and their ability to carry out basic research in zoology in a qualifying examination. Prior to the qualifying examination, the student will present to the committee a research proposal in which the soundness, originality, and feasibility of the investigative ideas are clearly revealed, and which—when approved—should serve as the basis of the doctoral dissertation. All students must complete an original dissertation project, present the results at a public seminar, and pass an oral defense consisting of questions put forth by members of the dissertation committee.

Teaching Requirement

All graduate students are encouraged to obtain appropriate teaching experience, preferably as a teaching assistant.

Research and Facilities

The zoology graduate program is supplemented by courses and research in other biological science departments and institutes at the University. These include the Center for Marine Biology, Center for Ocean Sciences, and Center for Ocean Engineering and the Sea Grant Program. See the Marine Program. The newest research center, the Center for Freshwater

Biology (CFB), provides research, training and outreach activities related to freshwater systems and integrates activities of laboratories and programs that already exist or are presently being developed at the University. The Lakes Lay Monitoring Program, dedicated to preservation and sound management of lakes through citizen-based monitoring and research, was begun at the University two decades ago and is administered jointly by the CFB and the Cooperative Extension Service.

The Department of Zoology also has access to several research facilities near the campus. The Jackson Estuarine Laboratory, the Coastal Marine Laboratory, and the Anadromous Fish and Aquatic Invertebrate Research Laboratory.

Courses

801	Conservation Biology	4 cr.
805	Population Genetics	4 cr.
808	Stream Ecology	4 cr.
810	Ichthyology	4 cr.
811	Zooplankton Ecology	4 cr.
812	Mammalogy	4 cr.
813	Animal Behavior	4 cr.
815	Molecular Evolution	4 cr.
817	General Limnology	4 cr.
819	Field Limnology	4 cr.
823	Quantitative Genetics	4 cr.
825	Marine Ecology	4 cr.
827	Field Ecology of Amphibians and Reptiles	4 cr.
828	Comparative Systematics and Evolution of Invertebrates	4 cr.
829	Developmental Biology of the Vertebrates	4 cr.
831	Systems Approach to Biological Ocean Science	3 cr.
833	Behavioral Ecology	4 cr.
850	Biological Oceanography	4 cr.
872	Fisheries Biology	4 cr.
873	Physiology of Fish	4 cr.
877	Neurobiology and Behavior	4 cr.
895	Advanced Studies	1 to 4 cr.
896	Special Investigations	1 to 4 cr.
899	Master's Thesis	6 to 10 cr.
901	Research Methods in Zoology	2 cr.
915	Population Ecology	4 cr.
997	Zoology Seminar	1 to 2 cr.
998	Zoology Seminar	1 to 2 cr.
999	Doctoral Research	

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Associate Professor of Education

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Professor of Animal Science

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Associate Professor of Nursing

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Associate Professor of Biochemistry and Genetics

Douglas M. Lanier, Ph.D. (2001-2004)
Associate Professor of English

Thomas D. Lee, Ph.D. (2000-2003)
Associate Professor of Plant Biology

Harvey K. Shepard, Ph.D. (1999-2002)
Professor of Physics

Palligarnai T. Vasudevan, Ph.D. (2001-2004)
Professor of Chemical/Environmental Engineering

(Three graduate students are appointed to this council each year.)

Faculty of the Graduate School

Aber, John D. (1987)
Professor of Natural Resources and Earth, Oceans, and Space and Complex Systems Research Center; Ph.D., Yale University, 1976.

Abrams, Eleanor D. (1994)
Associate Professor of Education; Ph.D., Louisiana State University, 1993.

Afolayan, Funso (1996)
Associate Professor of History; Ph.D., Obafemi Awolowo University, Nigeria, 1991.

Aikins, Janet (1979)
Professor of English; Ph.D., University of Chicago, 1980.

Alexander, Lee (2000)
Research Associate Professor of Ocean Engineering; Ph.D., Yale University, 1986.

Amato-Wierda, Carmela C. (1995)
Assistant Professor of Materials Science; Ph.D., Rensselaer Polytechnic Institute, 1993.

Andrew, David S. (1976)
Professor of Art History and the Humanities; Ph.D., Washington University, 1977.

Andrew, Michael D. (1966)
Professor of Education; Ed.D., Harvard University, 1969.

Annicchiarico, Michael J. (1991)
Associate Professor of Music; Ph.D., Brandeis University, 1993.

Appel, Kenneth I. (1993)
Professor of Mathematics; Ph.D., University of Michigan at Ann Arbor, 1959.

Archer, John M. (1996)
Associate Professor of English; Ph.D., Princeton University, 1988.

Armstrong, Capt. Andrew (1999)
Adjunct Professor of Ocean Engineering and Co. Director of Center for Coastal & Ocean Mapping/ JHC; M.S., Johns Hopkins University, 1991.

Arnoldy, Roger L. (1967)
Professor of Physics and Earth, Oceans, and Space; Ph.D., University of Minnesota, 1962.

Ashwell, Thomas W. (1998)
Assistant Professor of Kinesiology; Ph.D., University of Massachusetts at Amherst, 1994.

Babbitt, Kimberly J. (1996)
Associate Professor of Wildlife Ecology; Ph.D., University of Florida, 1996.

Baber, Kristine M. (1984)
Associate Professor of Family Studies; Ph.D., University of Connecticut, 1983.

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Black, Kelly J. (1994)
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Burger, John F. (1977)
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Calculator, Stephen N. (1983)
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Carter, Michael J. (1987)
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Chandler, Donald S. (1981)
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Charpentier, Michel (1999)
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Chiu, Monica E. (1998)
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Choi, Chi-Young (2001)
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Christie, Drew (1981)
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Condon, William A. (1976)
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Cote, Rick H. (1988)
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Garrett, Peter W. (1970)
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Gilbert, William A. (1993)
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Gittell, Ross J. (1993)
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Givan, Curtis V. (1990)
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Goodspeed, Charles H. (1978)
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Gould, Eliga H. (1993)
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Gress, David L. (1974)
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Grinde, Roger B. (1993)
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Gullace, Nicoletta F. (1995)
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Hackett, Robin (2001)
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Hadwin, Donald W. (1977)
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Hageman, Elizabeth H. (1971)
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Hallett, Richard (1996)
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Halstead, John M. (1988)
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Hamilton, Lawrence C. (1977)
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Haney, James F. (1972)
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Hansen, Larry J. (1973)
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Hardy, Stephen H. (1988)
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Harris, Benjamin (2001)
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Harris, J. William (1985)
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Harris, Larry G. (1969)
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Hatcher, Philip J. (1986)
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Henry, Robert M. (1980)
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Herold, Marc W. (1975)
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Hibschweiler, Rita A. (1988)
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Hight, Eleanor M. (1992)
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Hollinger, David Y. (1995)
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Holtrop, Maurik (2000)
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Schwab, Charles G. (1975)
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Schwarz, Marc L. (1967)
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Stibler, Robert (1978)
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Stine, William Wren (1984)
Associate Professor of Psychology; Ph.D., Georgia Institute of Technology, 1983.

Stine-Morrow, Elizabeth A. L. (1991)
Associate Professor of Psychology; Ph.D., Georgia Institute of Technology, 1983.

Stock, Marjorie Korff (1996)
Adjunct Associate Professor of Communication Sciences and Disorders; M.D., University of Massachusetts at Amherst, 1987.

Stokes, Martin (1999)
Adjunct Professor of Animal Science; Ph.D., University of Glasgow, 1978.

Strait, John B. (2001)
Assistant Professor of Geography and Sociology; Ph.D., University of Georgia, 1999.

Straus, Murray A. (1968)
Professor of Sociology; Ph.D., University of Wisconsin at Madison, 1956.

Straussfogel, Debra L. (1992)
Associate Professor of Geography and Natural Resources; Ph.D., Pennsylvania State University, 1987.

Stucchi, Arthur F. (1994)
Adjunct Associate Professor of Animal and Nutritional Sciences; Ph.D., University of New Hampshire, 1988.

Sugerman, Deborah A. (1997)
Assistant Professor of Kinesiology; Ph.D., University of Maine at Orono, 1990.

Sullivan, Elise R. (2001)
Assistant Professor of Microbiology; Ph.D., University of Maryland, 1999.

Sullivan, Janet R. (1985)
Adjunct Associate Professor of Plant Biology; Ph.D., University of Oklahoma, 1984.

Sullivan, Judith A. (1990)
Professor of Nursing; Ed.D., University of Rochester, 1972.

Sullivan, Patricia A. (1988)
Associate Professor of English; Ph.D., Ohio State University, 1988.

Sundberg, Donald C. (1978)
Vice President for Research and Public Service and Associate Professor of Chemical Engineering; Ph.D., University of Delaware, 1970.

Sussenberger, Barbara (1978)
Associate Professor of Occupational Therapy; M.S., Boston University, 1975.

Swartz, Erik E. (2000)
Assistant Professor of Kinesiology; Ph.D., University of Toledo, 2000.

Swift, M. Robinson (1976)
Professor of Mechanical Engineering and Ocean Engineering; Ph.D., University of New Hampshire, 1974.

Tagliaferro, Anthony R. (1978)
Professor of Nutritional Sciences; Ph.D., Cornell University, 1978.

Talbot, Robert W. (1988)
Research Professor of Earth Sciences and Earth, Oceans, and Space; Ph.D., University of Wisconsin at Madison, 1981.

Taylor, James T. (1977)
Professor of Zoology; Ph.D., Oregon State University, 1977.

Taylor, Robert L., Jr. (1984)
Professor of Animal Science and Genetics; Ph.D., Mississippi State University, 1981.

Thein, May-Win L. (1999)
Assistant Professor of Mechanical Engineering; Ph.D., Oklahoma State University, 1999.

Thompson, Allen R. (1974)
Associate Professor of Economics and Business Administration; Ph.D., University of Texas at Austin, 1973.

Tillinghast, Edward K. (1967)
Professor Emeritus of Zoology and Adjunct Professor of Zoology; Ph.D., Duke University, 1967.

Tisa, Louis S. (1994)
Associate Professor of Microbiology and Genetics; Ph.D., University of Wisconsin at Madison, 1987.

Tomellini, Sterling A. (1985)
Professor of Chemistry; Ph.D., Rutgers, The State University of New Jersey, 1985.

Torbert, Roy B. (1989)
Director, Space Science Center and Professor of Physics and Earth, Oceans and Space; Ph.D., University of California at Berkeley, 1979.

Townson, David H. (1997)
Assistant Professor of Animal Science; Ph.D., Ohio State University, 1993.

Triplett, Timm A. (1981)
Associate Professor of Philosophy; Ph.D., University of Massachusetts at Amherst, 1982.

Trout, B. Thomas (1969)
Professor of Political Science; Ph.D., Indiana University at Bloomington, 1972.

Trubowitz, Rachel (1986)
Associate Professor of English; Ph.D., Columbia University, 1985.

Trumble, William R. (1999)
Associate Dean for Research and Agricultural Experiment Station, Director of Agricultural Experiment Station and Professor of Biochemistry and Molecular Biology; Ph.D., University of Texas at Dallas, 1981.

Tsang, Paul C. (1989)
Associate Professor of Animal Science; Ph.D., Boston University, 1986.

Tsukrov, Igor I. (1997)
Assistant Professor of Mechanical Engineering; Ph.D., Tufts University, 1996.

Tucker, Corinna Jenkins (2000)
Assistant Professor of Family Studies; Ph.D., Pennsylvania State University, 1998.

Tucker, James (1992)
Associate Professor of Sociology; Ph.D., University of Virginia, 1992.

Turner, Elise H. (1990)
Adjunct Assistant Professor of Computer Science; Ph.D., Georgia Institute of Technology, 1989.

Turner, Heather A. (1991)
Associate Professor of Sociology; Ph.D., University of California at San Francisco, 1990.

Turner, Roy M. (1990)
Adjunct Assistant Professor of Computer Science; Ph.D., Georgia Institute of Technology, 1989.

Ulrich, Laurel (1995)
Adjunct Professor of History; Ph.D., University of New Hampshire, 1980.

Urquhart, Peter W. (1989)
Associate Professor of Music; Ph.D., Harvard University, 1988.

Vagts, Peggy A. (1978)
Professor of Music; M.M., University of Wisconsin at Madison, 1978.

Van Osdol, Donovan H. (1970)
Professor of Mathematics; Ph.D., University of Illinois at Urbana-Champaign, 1969.

Van Zandt, Cynthia J. (1998)
Assistant Professor of History; Ph.D., University of Connecticut, 1998.

VanDeveer, Stacy D. (1998)
Assistant Professor of Political Science; Ph.D., University of Maryland, 1997.

VanGundy, Karen (2001)
Assistant Professor of Sociology; Ph.D., University of Miami (Fla.), 2001.

Varki, Elizabeth (1997)
Assistant Professor of Computer Science; Ph.D., Vanderbilt University, 1997.

Vasudevan, Palligarnai T. (1988)
Professor of Chemical/Environmental Engineering; Ph.D., Clarkson University, 1988.

Veal, Larry J. (1982)
Associate Professor of Music; M.M., University of Illinois at Urbana-Champaign, 1976.

Venkatachalam, A. R. (1992)
Associate Professor of Information Systems; Ph.D., University of Alabama, 1990.

Vogel, Karla E. (1986)
UNHM Assistant Professor of Computer Information Systems; M.B.A., Rivier College, 1990.

Von Damm, Karen L. (1992)
Professor of Geochemistry and Earth, Oceans, and Space; Ph.D., Massachusetts Institute of Technology, 1984.

Vorosmarty, Charles J. (1992)
Research Professor of Earth Sciences and Earth, Oceans, and Space; Ph.D., University of New Hampshire, 1991.

Vroman, Neil B. (1984)
Associate Dean of the School of Health and Human Services and Associate Professor of Kinesiology; Ph.D., Pennsylvania State University, 1982.

Wake, Cameron P. (1995)
Research Assistant Professor of Earth Sciences and Earth, Oceans, and Space; Ph.D., University of New Hampshire, 1993.

Walker, Charles W. (1976)
Professor of Zoology; Ph.D., Cornell University, 1976.

Wansart, William L. (1985)
Associate Professor of Education; Ed.D., University of Northern Colorado, 1984.

Ward, Judith D. (1972)
Associate Professor of Occupational Therapy; Ph.D., The Fielding Institute, 1997.

Ward, Larry G. (1989)
Research Associate Professor of Earth Sciences; Ph.D., University of South Carolina, 1978.

Ward, Sally (1980)
Professor of Sociology; Ph.D., Brown University, 1977.

Ware, Colin (2000)
Professor of Computer Science and Ocean Engineering; Ph.D., University of Toronto, Canada, 1980.

Warner, Rebecca M. (1981)
Professor of Psychology; Ph.D., Harvard University, 1978.

Watson, Winsor H., III (1978)
Professor of Zoology; Ph.D., University of Massachusetts at Amherst, 1978.

Watt, David W. (1987)
Associate Professor of Mechanical Engineering; Ph.D., University of Michigan at Ann Arbor, 1987.

Watters, David H. (1978)
Professor of English; Ph.D., Brown University, 1979.

Weathersby, Rita (1978)
Associate Professor of Organizational Behavior; Ed.D., Harvard University, 1977.

Webb, Dwight (1967)
Associate Professor of Education; Ph.D., Stanford University, 1967.

Webster, Penelope E. (1987)
Associate Professor of Communication Sciences and Disorders; Ed.D., Boston University, 1984.

Weiner, James L. (1979)
Associate Professor of Computer Science; Ph.D., University of California at Los Angeles, 1979.

Weisman, Gary R. (1977)
Professor of Chemistry; Ph.D., University of Wisconsin at Madison, 1976.

Wells, Dave (2000)
Adjunct Professor of Ocean Engineering; Ph.D., University of New Brunswick, 1976.

Weyrick, Richard R. (1964)
Associate Professor of Forest Resources; Ph.D., University of Minnesota, 1968.

Wharton-McDonald, Ruth M. (1997)
Assistant Professor of Education; Ph.D., State University of New York at Albany, 1996.

Wheeler, Douglas L. (1965)
Professor of History; Ph.D., Boston University, 1963.

White, Barbara Prudhomme (1998)
Assistant Professor of Occupational Therapy; Ph.D., University of Minnesota, 1997.

Wible, James R. (1984)
Professor of Economics; Ph.D., Pennsylvania State University, 1980.

Williams, Daniel C. (1970)
Associate Professor of Psychology; Ph.D., University of California at Santa Barbara, 1970.

Williams-Barnard, Carol L. (1978)
Associate Professor of Nursing; D.N.Sc., Catholic University of America, 1979.

Windt, Mark R., M.D. (1998)
Adjunct Associate Professor of Communication Sciences and Disorders and Adjunct Professor of Nutritional Sciences; M.D., University of Connecticut, 1978.

Wirth, Clifford J. (1981)
Associate Professor of Political Science; Ph.D., Southern Illinois University at Carbondale, 1976.

Witzling, Mara R. (1977)
Professor of Art History; Ph.D., Cornell University, 1978.

Wolper, Ethel Sara (1996)
Assistant Professor of History; Ph.D., University of California at Los Angeles, 1994.

Wong, Edward H. (1978)
Professor of Chemistry; Ph.D., Harvard University, 1975.

Wood, Craig H. (1990)
Associate Professor of Operations Management; Ph.D., Ohio State University, 1991.

Woodruff, Alicia Quiroz (1994)
Assistant Professor of Spanish; Ph.D., University of California at Davis, 1992.

Woodward, Robert S. (2001)
Professor of Health Economics; Ph.D., Washington University, 1972.

Woodward, William R. (1975)
Professor of Psychology and Adjunct Professor of History; Ph.D., Yale University, 1975.

Wright, John J. (1970)
Professor of Physics; Ph.D., University of New Hampshire, 1969.

Wrighton, J. Mark (2000)
Assistant Professor of Political Science; Ph.D., University of Iowa, 1997.

Yamasaki, Mariko (1995)
Adjunct Assistant Professor of Natural Resources; M.S., University of Michigan at Ann Arbor, 1978.

Zercher, Charles K. (1991)
Associate Professor of Chemistry; Ph.D., University of Notre Dame, 1989.

Zielinski, Gregory A. (1990)
Adjunct Associate Professor of Earth Sciences; Ph.D., University of Massachusetts at Amherst, 1987.

Zsigray, Robert M. (1970)
Professor of Microbiology and Genetics; Ph.D., Georgetown University, 1969.

Zunz, Sharyn J. (1993)
Associate Professor of Social Work; Ph.D., Fordham University, 1993.

Index

Academic regulations 13
Academic standards 14
Access office 30
Accounting and finance 32
Administration and supervision. *See* Education.
Administrative withdrawal 8
Admission 6
Adult and occupational education 34
Advanced Polymer Laboratory 17
Agricultural Experiment Station 17
Animal and nutritional sciences 34
Application procedures 6
Assistantships 11
Auditing 7, 10, 16

Bachelor's degree/M.B.A. 7
Biochemistry and molecular biology 35
Browne Center 17
Business administration 36

Calendar, academic 106
Campus map 105
Career Services 28
Center for Advanced Molecular Interaction Sciences 18
Center for Business and Economic Research 17
Center for Coastal and Ocean Mapping/Joint Hydrographic Center 17
Center for Graduate and Professional Studies 5
Center for International Education 29
Center for the Humanities 18
Certificate of Advanced Graduate Study 15
Change in degree 8
Chemical engineering 39
Chemistry 39
Child Study and Development Center 18
Civil engineering 40
College teaching program 41
Communication sciences and disorders 43
Computer science 44
Computing and Information Services 25
Continuous registration 7, 9, 45
Cooperative Institute for Coastal and Estuarine Environmental Technology 19
Cooperative Institute for New England Maricultutre and Fisheries 19
Counseling. *See* Education.
Counseling Center 28
Course descriptions 32
Crimes Against Children Research Center 19
Dairy Teaching and Research Center 19
Degree requirements 13
Differential tuition 9
Dining facilities 27
Directions to Campus 104
Disabilities, services for students with 30
Diving program 22
Doctoral degree requirements 15
Doctoral programs 4, 5
(See also specific departments.)
Dual credit 14

Early admission/UNH seniors 7
Early childhood education. *See* Education.
Earth sciences 47
Economics 48
Education 49
Electrical and computer engineering 57
Elementary education. *See* Education.
Engineering Ph.D. program 58
English 59
Environmental conservation. *See* Natural resources.
Environmental education 60
Environmental Research Group 19

Facilities and services 26
Faculty 92
Family Research Laboratory 20
Family studies 62
Fees 9
Fellowships 11
Financial aid 9
Forestry. *See* Natural resources.
Frequently Called Numbers 107

Genetics program 63
Geochemical systems. *See* Earth sciences.
Geology. *See* Earth sciences.
Grading 13
Graduate Council 26, 91
Graduate life 25
Graduate programs 4
Graduate Student Organization 26
Graduate student residences 26
Graduation 16

Handicapped, services for 30
Health administration 65
Health Education and Promotion Office 28
Health Services 28
History 65
Housing 26
Hydrology. *See* Earth sciences.

Incompletes 13
Industrial Research Center 20
Institute for Policy and Social Science Research 20
Institute for the Study of Earth, Oceans, and Space (EOS) 20, 45
Institute on Disability 21
Insurance, accident and sickness 10
Intellectual Property Management Office 17
Intercollege cooperative doctoral programs. *See* Natural resources.
Interdisciplinary programs 5
International Students and Scholars Office 29
InterOperability Lab 21

Kinesiology 67

Language and linguistics. *See* English.
Leave of absence 8
Liberal studies 67
Library 25
Literacy and schooling. *See* Education.
Literature. *See* English.
Loans 12

Marine Program 21
Marriage and family therapy. *See* Family studies.
Marriage and Family Therapy Center 22
Master's degree requirements 14
Master's programs 4, 5
(See also specific departments.)
Materials science 68
Mathematics and statistics 70
Mechanical engineering 72
Memorial Union 27
Microbiology 72
Multicultural Student Affairs 29
Music 73

Natural resources 74
Natural resources Ph.D. program 75
New England Regional Student Program 9
New Hampshire Industries Group 22
New Hampshire Small Business Development Center 22
New Hampshire Water Resource Research Center 23
Non-Lethal Technology Innovation Center 23
Nonregistration 8
Nursing 77

Occupational therapy 78
Ocean engineering 79
Oceanography. *See* Earth sciences.
Off-campus courses 14
Organizations 26

Painting 108
Parking 30
Photo Captions 108
Physics 81
Plant biology 83
Police, University 31
Political science 83
Polymer Research Group 23
Preparing Future Faculty Program 23

President's Commission on the Status of People of Color 29
President's Commission on the Status of Women 29
President's Task Force on Gay, Lesbian, Bisexual, and Transgender Issues 30
Psychology 84

Reading. *See* Education.
Readmission 8
Recreation program and facilities 27
Refunds 10
Registration 7
Requirements, departmental 32
Research 17
Residency status 9
Resource administration and management 85
Resource economics 85

Scholarships 11
Sea Grant Program 23
Secondary education. *See* Education.
Senior citizens/tuition waiver 9
Sexual Harassment and Rape Prevention Program (SHARPP) 30
Social work 86
Sociology 87
Soil science. *See* Natural resources.
Spanish 89
Special education. *See* Education.
Special needs. *See* Education.
Special students 7, 14
Special-credit rule 14
Speech-Language-Hearing Center 24
Sub-degree exchange program 9
Summer session 8
Sustainability Programs Office 23

Teacher education. *See* Education.
Teaching Excellence Program 24
Transfer credit 14
Transportation 30
Trustees 91
Tuition 9

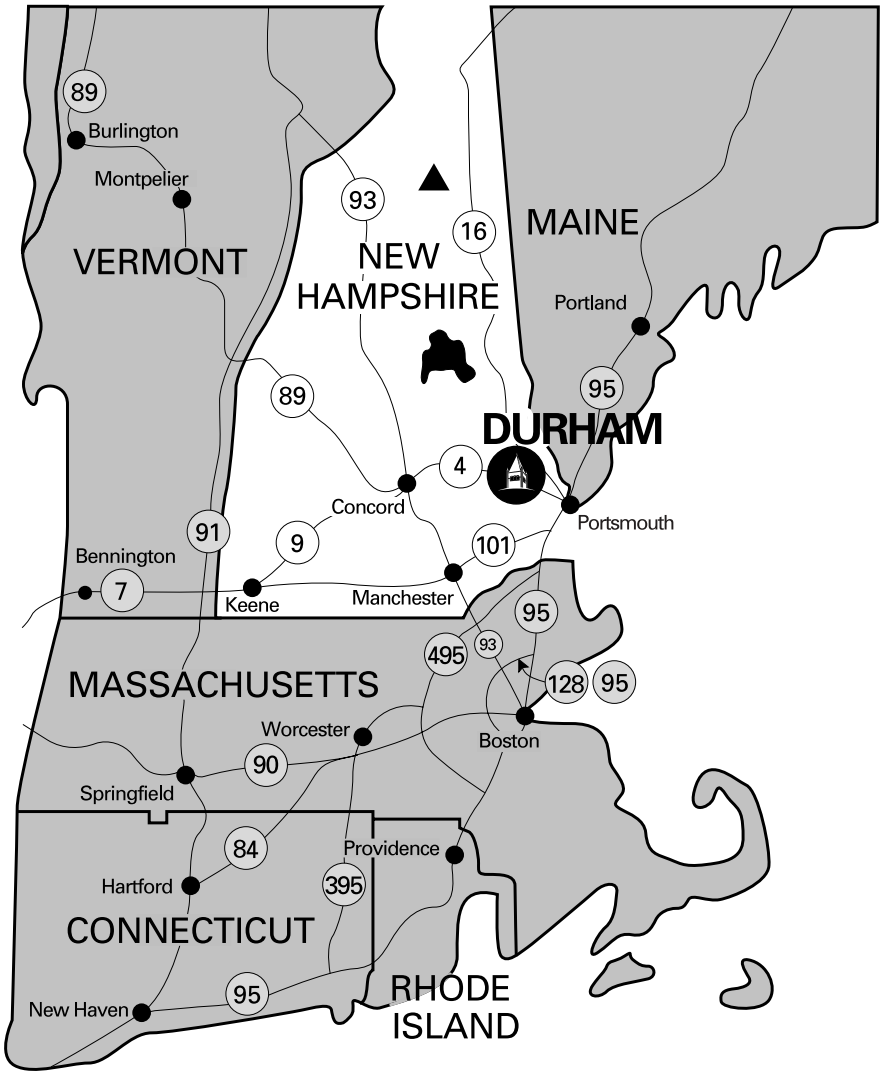
University history 5

Veterans benefits/information 12, 31

Water Resource Research Center 23
Water resources. *See* Natural resources.
Wildlife. *See* Natural resources.
Withdrawal 8, 16
Work-study program 12
Writing. *See* English.
Writing Across the Curriculum Program 23
Writing Center 23
Writing Laboratory 24

Zoology 89

Directions to Campus



By Car From Boston, Mass.

Follow I-95 North. When approaching the Portsmouth, N.H., area, take the exit bearing left, marked "NH Lakes and White Mountains, Routes 4 & 16." Continue on that road to Exit 6W (Concord-Durham) and follow Route 4 West. Exit at 155A and turn toward Durham. Follow 155A through a short stretch of farmlands and fields to the UNH campus.

From Hartford, Conn.

Take I-84/I-86 East out of Hartford to the Mass. Pike (I-90) to Auburn Exit 10 then East on I-290 to I-495 North. Drive east on I-495 North, Exit 56. Continue north on I-95, then follow the directions above for driving from Boston.

From Portland, Me.

Follow either I-95 or Route 1 South to the Portsmouth traffic circle. Take the Spaulding Turnpike north to Exit 6W (Concord-Durham). Then follow the directions above for driving from Boston.

From Concord, N.H.

Follow Route 4 East, and take the UNH/ Durham exit at 155A. Follow a short stretch of farmlands and fields to the UNH campus.

From Manchester, N.H.

Take Route 101 to the junction of Route 125. Follow Route 125 North to the Lee traffic circle. Drive east on Route 4, and then follow the directions above for driving from Concord.

By Plane

The airport at Manchester, N.H. is approximately 35 miles from Durham.

Logan International Airport, Boston is approximately 50 miles from Durham.

From Logan International Airport, Boston, you may use the C & J Trailways Airport Bus Service. Advance reservations are not required. For further information call (603) 742-5111 or, outside New Hampshire, (800) 258-7111. Or visit the Web page at www.cjtrailways.com.

From Manchester, N.H. Flight Line Inc. offers transportation from both Manchester and Logan Airports. Call 1-888-942-5044 or visit the Web page at www.flightlineinc.com.

By Bus

Depart C & J Trailways Bus Lines across from South Station in Boston. For further information call (603) 742-5111 from New Hampshire or (800) 258-7111 outside of New Hampshire. Or visit the Web page at www.cjtrailways.com.

UNH Campus Map

Residence and Dining Halls

1 Hetzel Hall
2 Alexander Hall
3 Fairchild Hall
4 Huddleston Dining Hall
5 Englehardt Hall
6 Hunter Hall
7 Gibbs Hall
8 Devine Hall
9 Randall Hall
10 Hitchcock Hall
13 Babcock House
23 Hubbard Hall
24 Philbrook Dining Hall
25 Christensen Hall
26 Williamson Hall
27 Mini-dorms
33 Smith Hall
34 Sawyer Hall
35 Scott Hall
36 Stoke Hall
37 Stillings Dining Hall
39 Jessie Doe Hall
40 Lord Hall
41 McLaughlin Hall
42 Congreve Hall

Apartment Complexes

28 Forest Park Apartments
61 Woodside Apartments
70 The Gables

Academic Buildings

12 McConnell Hall
19 Hamilton Smith Hall
21 Horton Social Science Center
22 Parsons Hall
29 Kingsbury Hall
30 Paul Creative Arts Center
31 Dimond Library
43 Morrill Hall
44 Murkland Hall
45 DeMerritt Hall
46 James Hall
47 Conant Hall
48 Hewitt Hall
49 Spaulding Life Sciences Center
50 Rudman Hall
51 Morse Hall
53 Pettee Hall
54 Taylor Hall
55 Kendall Hall
56 Nesmith Hall
57 New Hampshire Hall
63 Human Nutrition Center
64 Ocean Engineering Building
67 Greenhouses
68 Putnam Hall
69 Barton/Cole Halls
71 Equestrian Center
72 Environmental Technology Building

Administrative Offices/Support Services

14 Wolff House
15 Health Services
16 Pettee House
17 Verrette House
18 Grant House, Office of Admissions
20 Hood House
32 Thompson Hall
52 Zais Hall
60 Elliott Alumni Center
66 Visitor Information Center

Student Activities/Lodging

11 Memorial Union Building
38 The New England Center
58 Hamel Student Recreation Center
59 Whittemore Center Arena
62 Dairy Bar
65 Field House

2001–2002 Academic Calendar

Semester I

Sept. 3, M	Labor Day, University Holiday
Sept. 4, Tu	Classes begin
Sept. 18, Tu	Rosh Hashanah*
Sept. 27, Th	Yom Kippur*
Oct. 15, M	Fall break, no classes
Oct. 19, F	Mid-semester
Nov. 6, Tu	Election Day, no exams scheduled
Nov. 12, M	Veteran's Day, University Holiday
Nov. 13, Tu	Classes follow MONDAY schedule
Nov. 21, W	Classes follow MONDAY schedule
Nov. 22–23, Th–F	Thanksgiving Holidays
Nov. 26, M	Classes resume
Dec. 14, F	Last day of classes
Dec. 17, M	Reading Day; 6 p.m. Final exams begin
Dec. 22, Sat	Final exams end

Semester II

Jan. 21, M	Martin Luther King, Jr. Day, University Holiday
Jan. 22, Tu	Classes begin
Mar. 15, F	Mid-semester
Mar. 18–22, M–F	Spring recess
Mar. 25, M	Classes resume
Mar. 28, Th	Passover*
Mar. 29, F	Good Friday*
May 3, F	Orthodox Good Friday*
May 13, M	Last day of classes
May 14–15, Tu–W	Reading Days
May 16, Th	Final exams begin
May 23, Th	Final exams end
May 25, Sat	Commencement

2002–2003 Academic Calendar

Semester I

Sept. 2, M	Labor Day, University Holiday
Sept. 3, Tu	Classes begin
Sept. 7, Sat	Rosh Hashanah*
Sept. 16, M	Yom Kippur*
Oct. 14, M	Fall break, no classes
Oct. 18, F	Mid-semester
Nov. 5, Tu	Election Day, no exams scheduled
Nov. 11, M	Veteran's Day, University Holiday
Nov. 12, Tu	Classes follow MONDAY schedule
Nov. 27, W	Classes follow MONDAY schedule
Nov. 28–29, Th–F	Thanksgiving Holidays
Dec. 2, M	Classes resume
Dec. 13, F	Last day of classes
Dec. 16, M	Reading Day; 6 p.m. Final exams begin
Dec. 21, Sat	Final exams end

Semester II

Jan. 20, M	Martin Luther King, Jr. Day, University Holiday
Jan. 21, Tu	Classes begin
Mar. 14, F	Mid-semester
Mar. 17–21, M–F	Spring recess
Mar. 24, M	Classes resume
Apr. 17, Th	Passover*
Apr. 18, F	Good Friday*
Apr. 25, F	Orthodox Good Friday*
May 12, M	Last day of classes
May 13–14, Tu–W	Reading days
May 15, Th	Final exams begin
May 22, Th	Final exams end
May 24, Sat	Commencement

*These holidays, important to many members of the University community, are not University holidays, but they are listed here to facilitate planning of University events.

Note: Specific deadlines may be found on the Graduate School Calendar on the Web at **www.gradschool.unh.edu**.

Directory Assistance and Information

University Operators	(603) 862-1234 (off-campus)	Dial 0 (on campus)
University of New Hampshire home page		www.unh.edu
Access Office	862-2607	www.unh.edu/access/
Affirmative Action Office	862-2930	
Business Services	862-2230	www.unh.edu/controller/busservsstudent.html
Campus Recreation	862-2031	www.unh.edu/recreation/index.html
Career Services	862-2010	www.unh.edu/career-services
Center for Graduate and Professional Studies at UNH Manchester	641-4313	
Financial Aid Office	862-3600	www.unh.edu/financial-aid
Graduate School	862-3000	www.gradschool.unh.edu
Health Services	862-1530	www.unh.edu/health-services
Housing	862-2120	www.unh.edu/housing
Memorial Union and Information Center	862-2600	www.unh.edu/mub/
Off-Campus Housing	862-3612	www.unh.edu/mub/housinglist/
Office of International Students and Scholars	862-1508	www.unh.edu/oiss/
Office of Multicultural Student Affairs	862-2050	www.unh.edu/omsa
Parking	862-1010	www.unh.edu/parking/
Registration	862-1500	www.unh.edu/registrar/
Transcripts	862-3787	www.unh.edu/registrar/transcript/transcourinfo.html
UNH at Manchester	641-4321	www.unh.edu/unhm
UNH Bookstore	862-2140	
University Police	862-1427	www.unh.edu/upd/index.html
Veterans Information	862-1595	
Whittemore Center	862-4000	www.whittemorecenter.com
Wildcat Transit bus service	862-2328	www.unh.edu/parking/wtransit.html

Photo Captions

5	Thompson Hall in winter
6	Springtime view from Smith Hall
7	Hamilton Smith Hall
9	Postdoctoral student Todd Streelman processes tissue for genetic analysis
10	Graduate English class
11	Murkland Hall
12	Dimond Library Grand Reading Room
13	Doctoral student Bo-Young Lee in Professor Thomas Kocher's genetics lab
15	Demeritt Hall in winter
16	Professor Tom Davis with graduate student Laura DiMeglio in greenhouse (*Foster's Daily Democrat* photo)
17	Experiential learning at the Browne Center
18	New Environmental Technology Building
19	Dairy Teaching and Research Center CREAM students
20	One of the UNH marine research vessels
21	Music Professor Peter Urquhart, graduate student Amanda Nelson, and special collections librarian William Ross review a book of Gregorian chants
22	Ann Dubois, M.F.A. student, discusses her work with Professor Craig Hood
23	Professor Ray Grizzle, facility manager David Shay, and zoology graduate student Darren Scopel at Jackson Lab
24	Math Professor Kevin Short and graduate student Ed Miller review a computer image generated by the algorithm that started the company, Chaoticom
25	Dimond Library in winter
26	Babcock Hall
27	Whittemore Center, Hamel Recreation Center
27	Memorial Union Building
30	Thompson Hall in winter

Notes

Notes

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There are various grievance procedures to provide for the resolution of complaints under this policy. Information may be obtained at the Affirmative Action Office.

The University complies with federal guaranteed student loan regulations and will supply information about the employment of its graduates who have majored in specialized degree programs that normally lead to specific employment fields. This information may be obtained upon request from the University's Career Services, which is available to all students. The University does not guarantee employment to its graduates, but their chances for employment are enhanced if they have begun career planning early in their undergraduate days.

The University provides information pertaining to the Family Educational Rights and Privacy Act of 1974 (the "Buckley Amendment") in the annual student handbook. Information also is available from the Office of the Vice President for Student Affairs and the Office of the Provost and Vice President for Academic Affairs. The annual student publication, *Student Rights, Rules, and Responsibilities*, also contains University regulations and policies regarding student conduct.

Course descriptions and program descriptions may vary from the actual content or requirements because of advancements in the discipline or the active nature of academic planning and decision making. Accordingly, the University reserves the right to make whatever changes are deemed necessary in schedules, course content, requirements, academic programs (including their termination), calendar, tuition and fees, services, or any other aspect of the University's operations, giving whatever notice thereof is reasonable under the circumstances. Therefore, the provisions of this catalog are not an irrevocable contract between the students and the University. The University is also not responsible for failure to provide or for delay in providing expected services and/or facilities when such failure arises from causes beyond the reasonable control of the University.

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